

SAN GORGONIO PASS WATER AGENCY
1210 Beaumont Avenue, Beaumont, CA
Board of Directors Engineering Workshop
Agenda
July 14, 2014 at 1:30 p.m.

1. Call to Order, Flag Salute and Roll Call

2. Public Comment

Members of the public may address the Board at this time concerning items relating to any matter within the Agency's jurisdiction. To comment on specific agenda items, please complete a speaker's request form and hand it to the board secretary.

3. Discussion of Further Studies in Yucaipa/Calimesa Basins* (Page 2)

4. Review of Contract Extension Agreement in Principle* (Page 24)

5. Construction Update

6. Announcements

- A Regular Board Meeting, July 21, 2014 at 1:30 p.m.
- B. Finance and Budget Workshop, July 28, 2014 at 1:30 p.m.
- C. San Gorgonio Pass Regional Water Alliance – Technical Committee Meeting
- **Tuesday**, July 29, 2014 at 4:00 p.m. – Banning City Hall Conference Room
- D. San Gorgonio Pass Regional Water Alliance Meeting
- **Tuesday**, July 29, 2014 at 6:00 p.m. – Banning City Council Chambers
- E. Regular Board Meeting, August 4, 2014 at 1:30 p.m.

7. Adjournment

***Information included in Agenda Packet**

(1) Materials related to an item on this Agenda submitted to the Board of Directors after distribution of the agenda packet are available for Public inspection in the Agency's office at 1210 Beaumont Avenue, Beaumont during normal business hours. (2) Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection at the Agency's office, located at 1210 Beaumont Avenue, Beaumont, California 92223, during regular business hours. When practical, these public records will also be made available on the Agency's Internet Web site, accessible at <http://www.sgowa.com>. (3) Any person with a disability who requires accommodation in order to participate in this meeting should telephone the Agency (951 845-2577) at least 48 hours prior to the meeting in order to make a request for a disability-related modification or accommodation.

GEOSCIENCE



November 12, 2013

Mr. Bob Tincher, P.E.
Senior Engineer
San Bernardino Valley Municipal Water District
380 East Vanderblit Way
San Bernardino, California, 92408

Re: Proposal for Calculation of Annual Change in Storage Yucaipa Ground Water Basin and Preparation of Change and Storage Figure and Table for Years 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013 and Preparation of Technical Memorandum Presenting the Calculation of Annual Change in Storage Yucaipa Ground Water Basin Beginning for Year 2013-2014.

Dear Bob:

In accordance with your request, GEOSCIENCE has prepared a scope of work for calculation of the change in storage for the Yucaipa Ground Water Basin by subbasin for the following years: 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013. The usable storage was calculated for the Yucaipa Ground Water Basin by subbasins for the years 2008-2009 as a part of our recent work in determining the sustainable yield. The calculation of change in storage as proposed herein will be in the draft report for the Sustainable yield to be submitted in December of 2013.

In addition, we will collect ground water level, pumping, spreading data, and climatological data on an annual basis and maintain a basin wide database. The data will be used to calculate the annual change in storage for the Yucaipa ground Water Basin by subbasin. The scope of work described below is divided into calculation of historical change in storage using the current database developed for the sustainable yield project and preparation of figures illustrating the change in storage in map view (Task 1) and preparation of an annual technical memorandum which will provide the calculation of annual change in storage beginning in 2013-2014 with supporting data and figures (Task 2)

GEOSCIENCE SUPPORT SERVICES INCORPORATED

Ground Water Resources Development

P.O. Box 220, Claremont, CA 91711

T: 909-451-6650

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- Task 1** **The scope of work described below is divided into calculation of historical change in storage for Years 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013**
- Task 1a** Evaluation of Ground Water Level Data, select well set for data analysis
- Task 1b** Preparation of Lines of Equal Elevation of Ground Water, Fall 2005, 2006, 2007, 2009, 2010, 2011, 2012, and 2103
- Task 1c** Calculation of Change in Storage for 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013
- Task 1d** Prepare Figures and Table presenting the annual change and storage for 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013
- Task 2** **Preparation of Technical Memorandum Presenting the Calculation of Annual Change in Storage Yucaipa Ground Water Basin Beginning for Year 2013-2014**
- Task 2a** Obtain water level data from Partners, update ground water management database, and review and select the well data set for change in storage analysis.
- Task 2b** Prepare lines of equal elevation for the ground water surface for each subbasin for the New Year
- Task 2c** Calculate the change in storage for the previous Year
- Task 2d** Prepare Figure, illustrating distribution of change in storage by subbasin and update table presenting the annual change and storage to include the new calculation.
- Task 2e** Prepare Technical Memorandum presenting the supporting data for calculation of the change in storage for each subbasin.
- Task 2f** Prepare and Present the Calculation of Change in Storage in Annual Water Audit Meeting.
- Task 2g (Optional)** Re-Evaluate Safe Yield Estimates using the database updated annually for the change in storage calculation on a five-year basis. The re-evaluation would allow assessment of on-going ground water management augmentation programs as

they impact sustainable yield and provide a validation of longer-term sustainable yield for each subbasin.

Cost Estimate

The estimated cost for the Tasks 1 is \$26,700 and \$20,220 for Task 2 on an annual basis (see attached table.) An estimate of costs for Optional Task 2g should discussed near to the year of evaluation. Please call if you have any questions concerning the proposed scope or costs.

We appreciate the opportunity to provide our services to aid in the on-going effective management of the water resources in the Yucaipa Ground Water Basin

Sincerely,



Dennis E. Williams, Ph.D.
President

Costs for Calculation of Annual Change in Storage Yucaipa Ground Water Basin and Preparation of Change and Storage Figure and Table for Years 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013

Task Description	HOURS					Total Hours	Total Labor
	Principal Hydrologist \$280/Hr	Senior Geohydrologist \$195/Hr	Staff Geohydrologist \$125/Hr	Technical Illustrator \$105/Hr	Clerical \$85/Hr		
Task 1							
1a	Evaluation of Ground Water Level Data, select well set for data analysis		8	16	4		28 \$ 3,980
1b	Preparation of Lines of Equal Elevation of Ground Water, Fall 2005, 2006, 2007, 2009, 2010, 2011, 2012, and 2103	2	12	50	16		80 \$ 10,830
1c	Calculation of Change in Storage for 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013	4	12	32	4		52 \$ 7,880
1d	Prepare Figures and Table presenting the annual change and storage for 2005-2006, 2006-2007, 2009-2010, 2010-2011, 2011-2012, 2012-2013	2	8		18		\$ 4,010
	Totals	8	40	98	42	0	160 \$ 26,700

Costs for Calculation of Annual Change in Storage Yucaipa Ground Water Basin and Preparation of Change and Storage Figure and Table

Task Description		Principal Hydrologist \$280/Hr	Senior Geohydrologist \$195/Hr	Staff Geohydrologist \$125/Hr	Technical Illustrator \$105/Hr	Clerical \$85/Hr	Total Hours	Total Labor
Task 2								
2a	Obtain data from Partners, Update ground water management database, review and select well data set for analysis		4	24		2	30	\$ 3,950
2b	Preparation of Lines of Equal Elevation of Ground Water for New Year	1	2	6	2		11	\$ 1,630
2c	Calculation of Change in Storage for New Year	1	1	4	2		8	\$ 1,185
2d	Prepare Figure and update Table presenting the annual change and storage for New Year	1	1	4	2		8	\$ 1,185
2e	Prepare Technical Memorandum presenting the supporting data for calculation of the change in storage for each subbasin.	4	24	16	6	4	54	\$ 8,770
2f	Prepare and Present the Calculation of Change in Storage in Annual Water Audit Meeting	4	6	8	2		20	\$ 3,500
Totals		11	38	62	14	6	131	\$ 20,220
2g-Optional	5-year Re-Calculation of Safe Yield	TBD						

GEOSCIENCE



February 7, 2014

Mr. Bob Tincher, P.E.
Senior Engineer
San Bernardino Valley Municipal Water District
380 East Vanderblit Way
San Bernardino, California, 92408

Re: Proposal for Drilling, Logging, and Destruction of Ten Reverse Rotary Dual Tube Boreholes, Construction and Development of Three Monitoring Wells, and Preparation of Technical Memorandum, Yucaipa Recharge Investigation, Yucaipa Valley, California.

Dear Bob:

In accordance with your request, GEOSCIENCE has prepared a scope of work to conduct a preliminary hydrogeologic investigation in the Yucaipa Valley, California. The investigation will include drilling and logging of ten reverse rotary dual tube boreholes to investigate the subsurface conditions at the site.

The locations of the boreholes were initially discussed in a meeting held at the offices of the San Bernardino Valley Municipal Water District on October 16, 2013. Based on comments provided by the project partners, GEOSCIENCE prepared a location map showing the proposed boring locations that was subsequently submitted to the project partners for review and approval. On November 6, 2013, the project participants met again to discuss the final boring locations. A total of 10 boring locations were discussed. The locations of the borings are shown on the attached Figure. The project partners decided to eliminate exploration at location 8. Subsequently, an additional boring location was recommended by South Mesa Water Company in December 2013. The attached Figure shows the location of the proposed borings. This proposal will address the scope of work to complete the investigation at ten locations in the Yucaipa Valley and construction of three monitoring wells. The scope of work is described below and includes assumptions made as appropriate for the task described.

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Task 1 Kick-Off Meeting

GEOSCIENCE will prepare for and attend a kick-off meeting with the project partners. The purpose of the kick-off meeting is to review the project goals and assumptions and to discuss the logistics for the drilling and project schedule.

Task 2 Field Preparation Including Borehole Site Visit

GEOSCIENCE will visit each borehole site with the drilling contractor to observe site conditions and to determine logistics for site set-up and disposal options for water discharged to drilling operations. Site specific consideration observed during the site visit will be documented and outlined in the technical specifications for the review by the driller prior to mobilization.

Task 3 Preparation of Technical Specifications for Borehole Drilling and Monitoring Well Construction and Development

GEOSCIENCE will prepare technical specifications for borehole drilling and monitoring well construction and development. The Technical Specifications document will provide a description of the drilling and sampling operations, as well as provide pertinent information about site conditions for the driller. It is assumed that one document will be prepared for all ten borehole sites. The technical specifications will describe monitoring well construction and development for three monitoring well locations. Final monitoring well designs will be prepared in the field after collection of lithologic and geophysical data.

Task 4 Preparation of Borehole Permit Applications

GEOSCIENCE will obtain the appropriate permit for drilling and destruction of boreholes from the County of San Bernardino (Sites 1-7, and 9) and from the County of Riverside (Site 10). The permit applications will be completed and submitted to the County with the required fees. The approved permit will be kept on site during drilling operations.

Task 5 Contract the Driller, Onsite Inspection during Dual Tube Drilling, Water Sampling, Geophysical Borehole Logging, and Borehole Destruction.

In preparation for this proposal, GEOSCIENCE has contacted three drilling companies (Cascade, Layne Christensen and National Drilling) to obtain costs estimates for the project. GEOSCIENCE has selected National Drilling to complete project drilling because they own and operate the appropriate equipment for the project and have provided the most competitive project cost. The boreholes will be drilled to an approximate depth 50-ft below the ground water surface. The table below provides an estimate of depth to water and the target depth for each borehole location.

Yucaipa Ground Water Basin Recharge Investigation Exploratory Drilling				
Exploratory Boring Location No.	Closest Reference Well	Most Recent Depth to Water (ft, bgs)	Date of Water Level Measurement	Tentative Target Depth
1	USGS Well 1S/2W_36A2	257	Sep-13	310
2	USGS Well 1S/2W_36A2	257	Sep-13	310
3	YVWD Well 56	197	Sep-13	250
4	YVWD Well 27	49.5	May-13	100
5	USGS 2S/2W_12H1	350	Sep-13	400
6	SMWC Well 17	260	Mar-13	310
7	None			200
8	Deleted by Team			
9	WHWC Well 6	374	Oct-07	400
10	None			100
11	None			100
			Estimated Total footage	2480

After the target depth has been reached, the borings will be filled with bentonite drilling mud in order to complete down-hole geophysical surveys. The following geophysical surveys will be completed in each borehole:

- Gamma Ray Log
- Electric Log
- Laterolog-Resistivity
- Acoustic Log

During drilling operations, GEOSCIENCE will provide full-time supervision and complete lithologic logging of the boreholes, collect water samples during drilling, observe geophysical borehole logging, and borehole abandonment.

Ground water samples will be collected from the borings by airlifting or bailing from the drill pipe during exploration. The ground water samples will be provided to the project partners for a preliminary characterization through laboratory analysis. For this project, we have assumed that laboratory analysis will be the responsibility of the project partners and have therefore not included costs for laboratory analysis. The suite of analytes to be considered should be discussed by the project partners during the project kick-off meeting.

The following assumptions have made for Task 5:

- The project partners will obtain and provide site access for the drilling operations.
- The project partners will provide a source of water for drilling operations.
- California State Fish and Wildlife Permits, if required, will be provided by the project partners and a copy provided to GEOSCIENCE.
- Ground water encountered during drilling and drilling fluid can be discharged to the ground surface using a shallow percolation pit. If off-site disposal is required, the project partners will assume the responsibility for the appropriate off-site disposal, but will be coordinated by GEOSCIENCE staff.

Task 6 Mechanical Grading Analysis

Lithologic samples representative of subsurface conditions will be collected during the drilling operations. Selected samples will be submitted for mechanical grading analysis. The results of the mechanical grading analyses will be used to prepare initial estimates of hydraulic conductivity of the subsurface materials. The results will be included in the Technical Memorandum prepared as Task 9. We assume that four samples will be submitted for mechanical grading analysis from each borehole.

Task 7 Design, Construction, and Development of Monitoring Wells

The project partners have selected to complete Boring 1, Boring 2, and Boring 3 as monitoring wells. After e-logging, a monitoring well design will be prepared for the boring in the field based on the information from lithologic and geophysical logs. All three monitoring wells will be constructed using 2-inch PVC casing and screen. The wells will be completed with monument style covers. Details of monitoring well construction and development will be provided in the Technical Specifications to be prepared as a part of Task 3.

Task 8 Project Management: Includes Weekly Project Updates to Project Partners (assumes six project updates)

During the project, GEOSCIENCE will prepare weekly progress reports for the project partners. The progress reports will provide a summary of findings from data collected during the week and anticipated weekly progress schedule and goals.

Task 9 Prepare Technical Memorandum

A technical memorandum will be prepared which will include all collected data and a summary of findings and inclusions with reference to the suitability of project site locations for ground water recharge sites. In addition, a summary of completion details for the monitoring wells will be included in the Technical Memorandum. The potential sites will be ranked and "Next steps" of data gathering for each site and estimated costs will be included in the technical memorandum.

Task 10 Project Meetings: Assumes Two Meetings; one Project Update Meeting and Final Briefing at Completion of Project

We assume that a progress meeting will be help with the project partners after completion of the field work to present the data collected from the drilling and sampling of the boreholes and prior to preparation of the technical memorandum.

Cost Estimate

In preparation for this proposal we contacted three drilling contractors; Layne Christensen, Cascade, and National Drilling. GEOSCIENCE recommends National Drilling to complete project drilling because they own and operate the appropriate equipment for the project and have provided the most competitive project cost. Therefore the total costs for the Tasks 1 though 10 is \$515,095 including the estimate of cost for drilling and borehole abandonment and monitoring well construction and development provided by National Drilling

Please call if you have any questions concerning the proposed scope or costs. We appreciate the opportunity to provide our services on this important project

Sincerely,



Dennis E. Williams, Ph.D.
President


**TABLE 1 - COST ESTIMATE - PRELIMINARY GEOHYDROLOGICAL INVESTIGATION
 WORK TASKS FOR DRILLING AND REPORTING: TEN DUAL TUBE REVERSE ROTARY BOREHOLES, CONSTRUCTION AND DEVELOPMENT OF THREE MONITORING WELLS, YUCAIPA VALLEY, CALIFORNIA**

Task	Description	HOURS						Labor	Reimbursable Expenses ¹	Subcontractor National Drilling	Total Cost	
		Principal Hydrologist	Senior Geohydrologist	Senior Staff Geohydrologist	Staff Geohydrologist	Graphics	Clerical					
	<i>Hourly Rate:</i>	\$280	\$195	\$145	\$115	\$105	\$85					
1	Kick-Off Meeting	4	6	6				\$ 3,160	\$ 125		\$ 3,285	
2	Field Preparation including borehole site visits	1	24	16		4		\$ 7,700	\$ 210		\$ 7,910	
3	Preparation of Technical Specifications for Borehole Drilling and Monitoring Well Construction	1	8	32	8	12	2	\$ 8,830			\$ 8,830	
4	Preparation of Permit Application (Includes Permit Fees at \$300 per permit) and Obtaining Permits		2	6	22			\$ 3,790	\$ 3,000		\$ 6,790	
5	Onsite Inspection during Dual Tube Drilling, Water Sampling, Geophysical Borehole Logging and Borehole Destruction. Assumes 4 days per borehole x 10 boreholes x 10 hour days for field work	8	70	400				\$ 73,890	\$ 5,400	\$ 285,650	\$ 364,940	
6	Mechanical Grading Analysis. Assumes 4 sample intervals per boreholes.	1	5	10	55			\$ 9,030			\$ 9,030	
7	Preparation of Monitoring Well Designs for three Monitoring Wells and Oversight during Construction and Development of Three Monitoring Wells and Collecting of Groundwater Samples	4	12	60				\$ 12,160	\$ 400	\$ 31,950	\$ 44,510	
8	Project Management: Includes Weekly Project Updates to Project Partners (assumes six project updates)	6	24				16	\$ 7,720			\$ 7,720	
9	Prepare Technical Memorandum (1 Document for 10 Boreholes)	8	32	40	60	28		\$ 24,120			\$ 24,120	
10	Project Meetings: Assumes two meetings; one Project Update Meeting and Final Briefing at Completion of Project	8	16			8		\$ 6,200			\$ 6,200	
	Total Hours							\$ 156,600	\$ 9,135	\$ 317,600	\$ 483,335	
		Fee on Subconsultant - 10%								\$ 31,760		\$ 31,760
								TOTAL COST	\$ 156,600	\$ 9,135	\$ 349,360	\$ 515,095

Note:
¹ Reimbursable expenses include permit fees (assumes \$300 per borehole), field per diem of \$135/day, and report production.

Geoscience

Yucaipa Ground Water Recharge Investigation Study



A Drilling Company Built By Drillers

At National Exploration, Wells & Pumps we put safety, old values, experienced crews and industry-best equipment to work for you. By providing safe dependable drilling services, National consistently demonstrates its commitment to our clients, our employees and the community. Born of this industry and built on a foundation of integrity, our strength lies in our MSHA/OSHA trained, experienced personnel. We offer a full range of drilling services including diamond core, dual-tube, air/mud, flooded reverse, air rotary casing hammer, hollow stem auger, sonic and direct push, along with pump services. Our dedicated drill crews are supported by a management team, composed of industry veterans, and strategically placed field support teams that are able to respond 24/7. We welcome the opportunity to demonstrate our capabilities and earn your trust.

Safety

All of us at National are dedicated to operating safely from the ground up - reflecting the respect we have for each other and our clients. Safety is an intrinsic core value built into the foundation of our company and sits as a cornerstone of our culture.



The "Safety. Own It.", behavioral based program is supported by five full-time safety professionals who oversee employee training and conduct site/equipment audits. The Safety Supervisors, supported by the Safety Manager are in the field every day. Along with safety audits, the Safety Manager implements several programs that allow National to perform well below the industry rate for lost time accidents, total recordable incidents and EMR.

The programs include:

- NEAR MISS REPORTING AND INVESTIGATION
- INVESTIGATE HIGH RISK NEAR MISSES AS IF AN INJURY HAD OCCURRED
- TRACK AND REVIEW KEY PERFORMANCE INDICATORS FOR SAFETY ON A WEEKLY BASIS
- ROOT CAUSE ANALYSIS BASED INCIDENT REVIEW PROCESS
- ACTIVE CLAIMS MANAGEMENT PROCESS
- DAILY, WEEKLY AND MONTHLY EQUIPMENT INSPECTIONS
- WEEKLY SAFETY MEETINGS
- COMPETENCY BASED TRAINING
- JOB SAFETY ANALYSIS FOR ALL PROCESSES AND PROCEDURES
- MONTHLY JOB SITE AUDITS
- ZERO ACCIDENT AS A FUNDAMENTAL OBJECTIVE.
- WEEKLY SAFETY BRIEFINGS WITH PRESIDENT, AND ALL OF MANAGERS AND FIELD CREWS
- ALL NATIONAL EMPLOYEES HAVE STOP WORK AUTHORITY TO MAKE CONDITIONS SAFE AND PREVENT INCIDENTS.



Client Testimonials

National has been actively drilling at Round Mountain Gold since their conception early in 2011. In my mind they have set the bar high for excellence in safety and regulatory standards in the core and rotary drilling business.

*Earl G Doege, Safety Supervisor CMSP 031
Round Mountain Gold Corporation*

National's dedicated professional drilling crews and field supervisors performed in a demanding environment in order to fulfill every request we made. Successful installation of the IP probe in J-100+ was due to National's commitment to serving the needs of Millrock. We were impressed with your unwavering support during this drilling project. Each man provided excellent service and communication.

*Kati Gibler, San Jose Project Manager/Geologist
Millrock Resources, Inc.*

I was truly impressed after visiting your job site. It's evident that you have safety culture built into your company and that there is buy-in from your crews. They are participating in the safety process. National's state-of-the-art equipment is an investment that is definitely worthwhile. It's where the industry needs to go.

*John A. Melfi, CMSP Manager, Health & Safety
Freeport-McMoRan Copper & Gold*

I have been involved in drilling since 1973, beginning with oil companies and off-shore platforms, owned and operated by own air rig, and have consulted on over 2,000 drilling jobs. [National's] job performance last week exceeded any operations I have ever witnessed. The planning, efficiency, teamwork, and professionalism of each employee was impressive. There was not one minute of wasted time and the drill rig and equipment far exceeded by expectations. I was particularly impressed at how quickly you had the Morooka delivered to insure uninterrupted job flow when the soft-wet ground might have made continued drilling impossible. Your attention to safety was impressive. The drill crews were always on the job early; each person performed above expectations, safely, and was a pleasure to work with.

*Don Moore
Geoimagery*