STAFF REPORT

To: **Coastside County Water District Board of Directors**

From: **David Dickson, General Manager**

Agenda: **October 10, 2017**

Report Date: October 5, 2017

Subject: **Contract with Balance Hydrologics for Denniston/San Vicente Stream Gaging, Groundwater Monitoring, and Data Analysis**

Recommendation:
Authorize staff to contract with Balance Hydrologics, Inc. for Water Year 2018 stream gaging, groundwater monitoring, and data analysis for the Denniston Creek and San Vicente Creek watersheds for an estimated time-and-materials cost of $89,749.

Background:
Quantifying the amount of water available for diversion from Denniston and San Vicente Creeks is vitally important to the District's efforts to secure its water rights on those streams. Balance Hydrologics (Balance) has provided stream gaging, monitoring, and analysis services to the District starting with Water Year 2011 (WY11 - October 1, 2010 to September 30, 2011). Balance's proposal dated October 4, 2017 (Attachment A) covers WY18 continuation of gaging and analysis services for stations on Denniston and San Vicente Creeks, and groundwater monitoring.

Fiscal Impact:
Cost of $89,749 over FY18 and FY19, from funds included in the Capital Improvement Program for Denniston/San Vicente.

Balance Hydrologics, Inc.®

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October 4, 2017

David Dickson, General Manager
Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019-1995

RE: Proposal to gage Denniston Creek, San Vicente Creek, and monitor inactive wells, Water Year 2018

Dear Mr. Dickson:

This letter presents our recommended scope to continue surface water monitoring in Denniston and San Vicente Creeks, and groundwater in the adjoining alluvial aquifers. This proposal encompasses continuation of the Water Year 2011 (October 2010-September 2011, WY2011) through WY2017 into WY2018 of baseline stream gaging. Results will extend the five-year assessment period to provided data which will help the Coastside County Water District (CCWD) evaluate (a) streamflow adequacy, and (b) meet regulatory needs – both for the CCWD ongoing EIR process and for eventually perfecting of your water rights -- and (c) in this case, basic streamflow characterization, such that CCWD can plan a program of diversions most compatible with the uniquely 'spongy' Montara-type hydrology of these streams, as described in our previous reports. Extending the monitoring period will facilitate CCWD's environmental and permitting process and will be beneficial for assessing diversion strategies that meet your expectations for yield and for site-appropriate watershed protection.

In WY2017 we (a) continued monitoring the six stream gages, (b) posted flow, in addition to stage, on the Etheldore "real-time" station, and (c) concurrently monitored water levels (and salinities) in three wells, three piezometers, and in Pillar Point Marsh, such that interaction of streamflow and groundwater may be better described.

In WY2018 we will (a) continue monitoring five stream gages, (b) decommission one stream gage, at San Vicente below diversion (see Work Scope, below), and (c) concurrently monitor water levels (and salinities) in three wells, three piezometers, and in Pillar Point Marsh, such that interaction of streamflow and groundwater may be better described (see Work Scope, below).

To address the objectives of this work, we have simplified the technical scope of work task list to the following:

1. *Water Year 2018 monitoring*
2. *Draft and final water year 2018 reporting*
3. *Permit compliance reporting*
4. *Other studies not presently part of the scope of work which you request and authorize.*
5. *Project administration*

The next several paragraphs elaborate on this proposed approach.

Work Scope

Task 1. Water Year 2018 monitoring

The water year 2018 monitoring effort will include (a) monthly site visits to the five gaging locations to collect baseline data, (b) quarterly visits to monitor groundwater levels (and salinities) at three wells, three piezometers, and in the Pillar Point Marsh, and (c) 3-4 visits during storms.

The measurements must conform with the requirements of the Division of Water Rights, as put forth below. The monthly visits allow us to calibrate flow measurement at stations by performing a flow (discharge) measurement and a staff plate (gage height) reading. During quarterly visits we will also download data from the leveloggers (San Vicente above diversion) and make channel observations (such as new high-water marks, bed conditions, and changes in the riffles and/or logs which control flow at the various gages), and perform necessary maintenance and calibration. During winter storms when flows are elevated we will make supplemental field visits to measure flow and other observations (i.e. identify high-water marks, qualitative observations of water quality, when minor logjams form and dissipate, etc.) These visits are required to complete the stage-to-discharge rating curve through the highest flows observed. In the office, we will calculate the flow, enter the information into the station log, plot the data on a stage-to-discharge rating curve, add the downloaded data to the station spreadsheet, and reduce the data to daily mean flow values.

On Denniston Creek we recommend continued low-flow synoptic measurements to characterize potential underflow (flow which moves beneath the bed as groundwater connected to the stream) at station DCAD. The DCAD gaging site is located just upstream of Denniston Reservoir and associated diversion structure. It is possible that the slug of sediment upstream of the reservoir may be quite permeable such that we need to estimate underflow at this gage to support the technical analysis for your water rights. The sediment prism seems to pinch out near the upper Brussels sprouts field, so, we propose continuing the program of taking up to two additional measurements upstream of DCAD adjacent to the upper Brussels sprouts fields.

In WY15 we added an additional station on San Vicente Creek at Etheldore St. The additional station was necessary because the 1970 agreement with the Torrello Ranch granting CCWD permission to divert from San Vicente Creek requires that CCWD guarantee a ‘wetted bed’ at this location; if this condition is not met, CCWD must curtail its diversions until this condition is satisfied. In WY16 we upgraded this station to be a “real-time” station. In WY16 the real-time station at Etheldore only reported stage. In WY17 we began reporting flow, in addition to stage, in “real-time”.

With the addition of the San Vicente Creek at Etheldore gage, we recommend discontinuing the San Vicente below diversion gage. After two years of running the Etheldore gage, we have begun reporting stage and flow in “real-time”. During this period, the below diversion gage was a good back- up for the transitional period, however the Cabrillo Farms agricultural ponds, to the south of San Vicente Creek periodically overflow and spill downstream to San Vicente Creek. When spilling occurs, the overflow bypasses the San Vicente below diversion gage but is captured by the Etheldore gage. These flows have has been observed by Balance staff. To monitor all runoff, eliminate redundancy, and therefore monitor the stream efficiently, we recommend discontinuing the below-diversion gage (designated as SVBD).

Presently the preliminary station data is made available via our real-time system on the Balance Hydrologics website for the four real-time stations, SVAE, SVCA, DCAD and DCBC. This feature provides real-time information to both the CCWD staff and Balance staff. In addition to your uses of the real-time data portal, having this information available remotely will continue to improve winter monitoring, and allow us to continue to monitor into the future in a more cost-effective manner.

Due to the highly mobile bed on both Denniston Creek and San Vicente Creek, gaging these creeks is particularly challenging relative to channels that have more stable bedrock, cobble-boulder, or even gravel beds. To meet this challenge, we will continue to regularly visit the sites, particularly during high flow events. The real-time record also allows us to a) track bed shifts more precisely and b) refine our formal flow-rating curves for stations on both Denniston Creek and San Vicente Creek. In recent years, monitoring has focused on developing the low end of the rating curve. In WY18 we will continue to refine the low end of the rating curves, but also refine the high end of the rating curves, getting better estimates of flow during storm runoff, when diversions can most easily be accommodated with minimal environmental effects. This is particularly important for the new and re-located stations, such as San Vicente at Etheldore and at California. As such we will continue to have monthly site visits throughout the year, in addition to a number of planned storm visits.

Each of the three monitoring wells (Inactive wells 4, 7, and 9) is currently equipped with a levelogger that logs water level and temperature every hour. In addition, we suggest that the you continue to monitor the three-piezometer nest (three co-located piezometers screened at staggered depths) located at the north flank of West Avenue at Pillar Point Marsh. The three piezometers, initially constructed in 1989, have been cleaned out and instrumented for the past 6 years. The data help us to identify the constitute the lower boundary condition for the shallow aquifer system adjacent to San Vicente and Denniston Creeks.

This task provides time for us to measure depth-to-water and specific conductance in the three monitoring wells and three Pillar Point Marsh piezometers and download data during four quarterly site visits. In the office, we will enter the information into the station log, add the downloaded data to the station spreadsheet, calibrate and plot the hourly data.

Note that the Golden Gate National Recreation Area (GGNRA) now manages much of San Vicente and Denniston Creeks and the CCWD and Balance are required to submit data reports as part of the scientific sampling permit with them. We interpret that two gages on San Vicente Creek, SVAD, and SVBD and one gage on Denniston Creek, DCAD, are within or adjacent to GGNRA jurisdiction. GGNRA requires that our observers perform field-cleaning protocols to prevent the spread of Chytrid fungus and the

pathogen that causes sudden oak death. Balance staff have been trained in the protocol and have already implemented it during visits to San Vicente and Denniston Creeks.

Deliverable: Raw data used to develop a record of daily mean flow and temperature for each of the five stations, and posted near-real-time to public and/or operational websites; raw data that may be used to develop a record of daily mean water level and temperature for each of three CCWD monitoring wells and Pillar Point Marsh piezometers, plus monitoring forms. Scientific data are submitted to the GGNRA after the completion of the monitoring year, once reviewed by CCWD and finalized by Balance.

Task 2. Draft and final water year 2018 reporting

We will summarize and explain the basic hydrologic findings in a water year 2018 report. The written report will include a summary form for each station tabulating the daily mean data and identifying station descriptors and plots of the data and rating curves, and water surface time series data for the monitoring wells. This is a data report. In-depth interpretation will be reserved, and authorized separately should it become necessary for further EIR or regulatory efforts. We will submit the draft report to you, and prepare a final report responding to your comments, and perhaps those of others on your project team.

Deliverable: Draft report in Microsoft Word. Final report pdf, editable copy of the draft in Word, and one bound hard copy.

Task 3. Permit compliance reporting

Note that the Golden Gate National Recreation Area (GGNRA) now manages much of San Vicente and Denniston Creeks and that CCWD and Balance are in the initial phases of establishing a scientific sampling permit with them. One of the most important requirements is the annual submittal of data reports. We anticipate the deliverable will consist of a short cover letter and a packet of summary forms including rainfall and surface water gaging forms from relevant gages (Assumed to be DCAD, SVAD and –if continued --SVBD). We have added a small amount of time under this task to assemble these documents, after our annual report to you has been finalized, and transmit them to GGNRA staff.

Deliverable: Cover letter permit compliance submittal with form and table attachments

Task 4. Tasks to be authorized during the year, if any.

Given other regulatory initiatives in the area, it is possible that other work may be needed during the course of the water year. If and as you ask for additional services, we will track these as tasks 4a, 4b, etc., so that you have total clarity on what these additional assignments may cost. We appreciate the trust that has developed between CCWD and Balance, and want to be sure you are able to track all costs.

Task 5. Project administration

This task simply provides time to help schedule and administer project in a way that best helps you and us regularly track schedule and budget.

Anticipated Costs

Our estimates of staff assignments and level of effort for each task are shown in Table 1. The estimated total costs to complete this work are shown at the bottom of Table 2. In addition, Table 2 covers expenses not allocated to individual tasks, such as mileage. The rental fees include modem line fees (anticipated to be $30/month for real-time sites) and travel and equipment fees (Anticipated to be approximately $1500/year), and the occasional purchase of hardware to re-habilitate gage station, when issues arise.

As is customary for field-related jobs, this total also includes a 10% contingency allowance. The contingency allows for a smoother absorption of additional costs of things beyond our control which inhibit the efficient completion of our work. Examples of situations that might require use of the contingency allowance are repair and/or replacement of a stream gaging station damaged by high flows, earthquakes or other "Acts of God", changes requested by your staff or a landowner, a very wet year requiring additional visits, or shifts in regulatory requirements and lost samples due to lab or shipping company errors. A breakdown of rental costs associated with this project is available upon request. We have also assumed that CCWD will continue help obtain ready access to the gages and wells.

Please note that our staff billing rates have changed during **2017**. The new rates have been included in the attached budget table. We have made every effort to minimize the impact of these changes by allocated staff hours in a prudent, technically sound, but cost-effective manner. The monitoring budget has been spread among billing categories to account for a range of the staff we expect to be available.

We have tasked our work to assist you in understanding the basis of most costs and the timing of the work. After reviewing the costs, please let me know if they are in line with your expectations. Although we have made out best effort to provide an accurate estimate to you, our work is done on a time-and-expense basis, so costs could be somewhat higher or lower than these estimates.

Anticipated Schedule

We will begin drawing from this budget as WY17 comes to a close to cover our preparations already under taken for the beginning of the 2018 water year, and bill you once it has been approved by your Board of Directors. We will conclude monitoring through October 1, 2018. We will provide a completed draft report to the District in a timely manner. If needed earlier for regulatory purposes, we will attempt to adjust as needed for reporting.

Proposed Project Staff

Barry Hecht will continue as the Principal in charge and act as senior reviewer. Eric Donaldson will serve as project manager. Field hydrologists Eric Donaldson, Chelsea Neill, Mark Woyshner and Gustavo Porras (from Balance's Berkeley office), and Jason Parke (Santa Cruz office) have been servicing the stream gaging stations and wells and working with the data; they will continue to do so. Other staff may be called upon during winter storm flow monitoring.

Registration

Work will be conducted under active State of California registration, as required under the State's Business and Professional Code. The Division of Water Rights has recently tightened its enforcement of registration for hydrological reports.

Closing

Thanks for asking that we prepare this proposal. We appreciate the opportunity to continue the streamflow gaging through the next water year on these two creeks and look forward to supporting you through the ongoing and future work related to the EIR process.

Please let us know if you have questions or suggestions, or if your needs and schedule differ from our assumptions, above.

Sincerely,

BALANCE HYDROLOGICS, INC.

for Chelsea Neill
Project Hydrologist/Geomorphologist

Eric Donaldson, P.G.
Project Manager

Barry Hecht, CEG, CHg
Senior Principal

Encl. Tables 1 and 2 for WY2018

Table 1. Anticipated Staff Hours by Task

218057 Coastside County Water District Hydrologic Monitoring, WY2018

Task Number and Description	Sr. Principal	Principal	Sr. Specialist	Senior Professional	Project Professional	Sr. Staff Professional	Staff Professional	Assistant Professional	Junior Professional	GIS Sr Analyst	GIS/CADD Specialist	Sr. Proj Admin	Sr. Report Specialist	Report Specialist	Hydrologic Tech	Labor Costs For Task
Hourly Rate	*$245*	*$210*	*$195*	*$190*	*$175*	*$160*	*$135*	*$125*	*$115*	*$125*	*$115*	*$90*	*$85*	*$85*	*$75*	
Task 1. Water Year 2018 monitoring	21			16	82	80	172			1						$58,680
Task 2. Draft and final water year 2018 reporting	8			4	22		44			3			16	14		$15,435
Task 3. Permit compliance	1				3									1		$855
Task 4. Additional tasks, if any, to be authorized.	No work presently authorized															
Task 5. Project administration	2				12							12				$3,670
Subtotal Hours	32			20	119	80	216			4		12	16	15		
Total Hours	**514**															

Notes:

TOTAL LABOR	**$78,640.00**
Expenses from Table 2	***$2,950.00***
Contigency from Table 2	***$8,159.00***
GRAND TOTAL	**$89,749.00**

Table 2. Estimated Costs

218057 Coastside County Water District Hydrologic Monitoring, WY2018

Professional Fees	Rate	Hours	Allocation
Sr. Principal	$245	32	$7,840.00
Principal	$210	0	$0.00
Senior Specialist	$195	0	$0.00
Senior Professional	$190	20	$3,800.00
Project Professional	$175	119	$20,825.00
Senior Staff Professional	$160	80	$12,800.00
Staff Professional	$135	216	$29,160.00
Assistant Professional	$125	0	$0.00
Junior Professional	$115	0	$0.00
GIS Senior Analyst	$125	4	$500.00
GIS/CADD Specialist	$115	0	$0.00
Senior Project Administrator	$90	12	$1,080.00
Senior Report Specialist	$85	16	$1,360.00
Technical Typist	$85	15	$1,275.00
Hydrologic Technician	$75	0	$0.00
	Labor Subtotal (Table 1)		$78,640.00

Expenses				
Direct Expense Estimates				
Mileage	**1500**	miles @	$0.54	$810.00
Equipment Costs (Samplng gear during site visits, e.g, flow meter, etc.)				$600.00
Phone Line fees for Modem (4 stations @ 12 mo)		@	$30/mo	$1,440.00
Reimbursable Costs				
Other Travel, Subsistence		trips @		$0.00
Express Mail, Deliveries				$0.00
Maps and Aerial Photos				$0.00
Outside Copying, Blueprint				$0.00
Outside Consultants				$0.00
Analytical Laboratory Fees				$0.00
Materials and Supplies				$100.00
Permits, Licenses or Agency Inspection fees			***client responsibility***	$0.00
Printing				$0.00
Other				$0.00
			Expenses Subtotal	$2,950.00
			ESTIMATED TOTAL	**$81,590.00**
			Contingency	**$8,159.00**
Notes			**TOTAL w/ CONTINGENCY**	**$89,749.00**

Additional costs may be incurred if the instrumentation network is destroyed or damaged by a high-recurrence storn.

Project-related expenses will be bill at cost plus 7.5%; including work by outside consultants and analytical or testing laboratories.