STAFF REPORT

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

From: **David Dickson, General Manager**

Agenda: **December 11, 2018**

Report Date: December 6, 2018

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 2019 stream gaging, groundwater monitoring, and data analysis for the Denniston Creek and San Vicente Creek watersheds for an estimated time-and-materials cost of $102,368.

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 December 5, 2018 (Attachment A) covers WY19 continuation of gaging and analysis services for stations on Denniston and San Vicente Creeks, and groundwater monitoring.

Fiscal Impact:
Cost of $102,368 over FY19 and FY20, from funds included in the Capital Improvement Program for Denniston/San Vicente.

Attachment A

Balance Hydrologics, Inc.®

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Berkeley • Santa Cruz • Truckee

December 5, 2018

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 2019

Dear Mr. Dickson:

This letter presents our recommended scope to continue surface water monitoring in Denniston and San Vicente Creeks, and groundwater in the alluvial aquifers adjoining Denniston and San Vicente Creeks. This proposal encompasses continuation of the Water Year 2011 (October 2010-September 2011, WY2011) through WY2018 into WY2019 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 availability and (b) meet regulatory-staff expectations – both for the CCWD ongoing EIR process and for eventually perfecting of your water rights -- and (c) in this case, basic streamflow and geomorphic characterization, such that CCWD can plan a program of diversions most compatible with the uniquely 'spongy' Montara-type hydrology of these stream, (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 WY2018 we (a) continued monitoring five stream gages, (b) decommissioned one stream gage, at San Vicente below the existing diversion, (c) on May 16, 2018, under separate authorization from you, we added an additional stream flow gage on Pilarcitos Creek, and (d) 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 WY2019 we (a) continue monitoring five stream gages, (b) and 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 (see Work Scope, below). It should be noted that you have asked us to discontinue the Pilarcitos Creek gage. It should also be noted that we are recommending relocation of the Denniston Creek above diversion (DCAD) gage in WY19. The recent and unprecedented (during the period of gaging) bed aggradation through the reach have resulted in diffuse flows through the broad riparian corridor, making flows difficult to quantify accurately. Thus, we recommend moving the gage to a location upstream of the current gage, but downstream of Mr. Lea's diversion adjacent to the canyon brussels sprouts field.

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

1. *Water Year 2019 stream gaging and monitoring*
2. *Draft and final water year 2019 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 2019 monitoring

The water year 2019 monitoring effort will include (a) monthly site visits to the six 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), plus 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, field-meter and qualitative observations of water quality, when minor logjams form and dissipate, etc.) These visits are required to complete the stage-to-discharge rating curve(s) 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.

As noted above, we recommend relocation of the Denniston Creek above diversion (DCAD) gage in WY19. The recent and unprecedented (during the period of gaging) bed aggradation through the reach have resulted in diffuse flows through the broad riparian corridor, making flows difficult to quantify accurately. In addition, the regulatory history of the Airport Aquifer includes significant misconceptions because flow beneath the sediment deltaic wedge and the reservoir was not quantified and was not 'credited' to CCWD. Additionally, flumes, gages, and weirs constructed upstream of the Reservoir have repeatedly been destroyed, abandoned, or bypassed. We believe that operating both the DCAD gage at the water treatment plant and an upstream gage and the canyon Brussels sprouts field through at least WY19 will allow this underflow to recognized and knowledgeably estimated, and a reasonable scalar between the two gages developed in support of your water rights. Beyond WY19, it may be that we may occasionally need to report the flow record at DCAD as a seasonal gage, but that will be sufficient to establish that Denniston Creek is actively recharging the Airport Aquifer with underflow, so that there is no need to make an instream flow reservation (obviating diversions from Denniston) to protect other water entitlements by other entities or for Pillar Point Marsh. Thus, we recommend moving the gage to a location upstream of the current gage, likely just downstream of Mr. Lea's diversion adjacent to the canyon brussels sprouts field, where we have been making synoptic low-flow measurements since 2015.

Our proposed budget assumes moving equipment currently deployed at the Denniston Water Treatment Plant to be moved upstream soon after this scope is approved, and the currently station be decommissioned. Moving the real-time gage further up the canyon may require additional telemetry investment due to poor cellular service. This may include either satellite or radio telemetry equipment additional power needs. We assume additional equipment purchases, if necessary, will be made by us only under separate task order from CCWD. We also assume the gage will be located at, but just downstream of Cabrillo Farms Canyon Field diversion, and that this will avoid the need to procure access and easement from GGNRA. Additional coordination with GGNRA associated with moving the DCAD gage is not covered under this cost estimate and will be authorized separately by you.

In keeping with recommendations in the preceding paragraph, we recommend continuation of the low-flow synoptic measurements at the former DCBD locations to characterize potential gains and losses between the reservoir and mouth of Denniston Creek at station DCAD (the water treatment plant), Denniston Reservoir.

In May 2018, at your request we established a real time flow gage on Pilarcitos Creek below the CCWD well field (PCBW). It is our understanding that, based on internal discussions regarding operations at the Pilarcitos well field, you would like to discontinue this gage. The retired equipment will be removed. Balance will store the gear at our Berkeley offices for future use by CCWD, unless you specify otherwise.

Presently the preliminary station data is made available via our real-time system on the Balance Hydrologics website for the five real-time stations, PCBW, SVAE, SVCA, DCAD and DCBC. This feature provides real-time information to both the CCWD staff and Balance staff. You have chosen to make some of this information available to the community at large, such that GGNRA and resource-agency staff as well as residents of the area can come to better understand the local streams. Finally, in addition to CCWD uses of the real-time data portal, having this information available remotely will continue to improve winter monitoring, and allows us to continue to monitor into the future in a more cost-effective manner.

Due to the highly mobile sandy beds 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 gage 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 WY19 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 or post-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 St and at California Ave and the eventual relocation of the new DCAD gage. As such we will continue to make regular site visits are intervals of about a month 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 records 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 have been instrumented for the past 6 years. These data help us to identify 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 Creek watersheds. CCWD is now required to submit data reports as part of the scientific sampling permit which GGNRA has issued to you. 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. We will prepare the annual form for submittal by CCWD. Additionally, 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 six 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. As noted above, we will prepare the data submittal for CCWD, and revise it consistent with your comments prior to submittal to the GGNRA.

Task 2. Draft and final water year 2019 reporting

We will summarize and explain the basic hydrologic findings in a water year 2019 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 and SVAD). 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 when you so request.

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.

We have included time for key project staff, Barry Hecht, Eric Donaldson, and Chelsea Neill to prepare and attend a meeting at your offices, which occurred on November 20, 2018 to review and discuss your gaging program.

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 repair gage stations, when floods, winds, or wildlife may damage them. We have also assumed the new DCAD will be equipped with self-contained pressure transducers previously purchased by use and recently removed from SVBD.

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.

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 WY18 ends (Sept. 30, 2018) to cover our preparations already under taken for the beginning of the 2019 water year and bill you once it has been approved by your Board of Directors. We will conclude monitoring on September 30, 2019. 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. Chelsea Neill will serve as deputy project manager. Field hydrologists Eric Donaldson, Chelsea Neill, John Hardy, 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 active 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.

Eric Donaldson, P.G.
Project Manager

Chelsea Neill
Project Hydrologist/Geomorphologist

Barry Hecht, CEG, CHg
Senior Principal

Encl. Tables 1 and 2 for WY2019

Table 1. Anticipated Staff Hours by Task

219057 Coastside County Water District Hydrologic Monitoring, WY2019

Task Number and Description	Sr. Principal	Senior Professional	Project Professional	Sr. Staff Professional	Staff Professional	GIS Sr Analyst	Sr. Proj Admin	Sr. Report Specialist	Labor Costs For Task
Hourly Rate	*$245*	*$190*	*$175*	*$160*	*$135*	*$125*	*$90*	*$85*	
Task 1. Water Year 2018 monitoring	20	20	50	160	160	1			$64,775
Task 2. Draft and final water year 2018 reporting	8		10	30	30	3	16	16	$15,735
Task 3. Permit compliance process	1		3					1	$855
Task 4. Additional tasks, if any, to be authorized.			No work presently authorized						
Task 5. Project administration	10		20	10			12		$8,630
Subtotal Hours	39	20	83	200	190	4	28	17	
Total Hours	**581**								

Notes:

Total Labor	**$89,995.00**
Expenses from Table 2	***$3,066.50***
Contigency from Table 2	***$9,306.15***
GRAND TOTAL	**$102,367.65**

Table 2. Estimated Costs

219057 Coastside County Water District Hydrologic Monitoring, WY2019

Professional Fees	Rate	Hours	Allocation
Sr. Principal	$245	39	$9,555.00
Principal	$210	0	$0.00
Senior Specialist	$195	0	$0.00
Senior Professional	$190	20	$3,800.00
Project Professional	$175	83	$14,525.00
Senior Staff Professional	$160	200	$32,000.00
Staff Professional	$135	190	$25,650.00
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	28	$2,520.00
Senior Report Specialist	$85	17	$1,445.00
Technical Typist	$85	0	$0.00
Hydrologic Technician	$75	0	$0.00
		Labor Subtotal (Table 1)	$89,995.00

Expenses			
Direct Expense Estimates			
Mileage	**1700** miles @	$0.55	$926.50
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	$3,066.50
		ESTIMATED TOTAL	**$93,061.50**
		Contingency	**$9,306.15**
Notes		**TOTAL w/ CONTINGENCY**	**$102,367.65**

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.