United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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January 4, 2017

Ms. Rebecca Bjork, Public Works Director
Public Works Department
City of Santa Barbara
630 Garden Street
Santa Barbara, California 93102

Attention: Joshua Haggmark, Water Resources Manager

Dear Ms. Bjork:

This letter confirms discussions between our respective staffs, concerning the continuation of the cooperative water resources program between the Public Works Department City of Santa Barbara (City) and the U.S. Geological Survey (USGS) for the period November 1, 2016 to October 31, 2017.

The proposed program and associated costs are as follows:

1. Surface Water Gaging Stations

The U.S. Geological Survey (USGS) will continue to operate, maintain, and publish streamflow records for the following stations:

Station number and name		City Funds	USGS Funds	Total Funds
11119745	Mission Creek near Rocky Nook Park	$14,700	$ 7,400	$22,100
11122000	Santa Ynez above Gibraltar Dam	14,700	7,400	22,100
11123000	Santa Ynez below Gibraltar Dam	14,700	7,400	22,100
11121900	Gibraltar Dam Diversion Weir at Gibraltar	8,600	-0-	8,600
11122010	Gibraltar Release Dam Weir at Gibraltar Dam	8,600	-0-	8,600
	Subtotal	**$61,300**	**$22,200**	**$83,500**

2. Groundwater Monitoring

Water-level monitoring:

USGS personnel will make monthly water-level measurements at 66 wells as listed in Table 1. USGS personnel will also make monthly water-level measurements at 4N/27W-8M6 and continue to operate the continuous recorder at 4N/27W-8M5 (San Remo). Results of the measurements will be stored in NWIS.

Water-quality monitoring:

The USGS will continue to operate a groundwater quality monitoring network per the plan started in 1989. Annual sampling for major dissolved ions, trace metal, stable isotopes, nutrients, and dissolved solids (List A) will occur in June at 18 wells as listed in Table 1, with 4 of these also sampled quarterly for specific electrical conductance, pH, dissolved solids, and dissolved chloride concentration (List B). Triennial sampling in June for major dissolved ions, trace metal, stable isotopes, nutrients, and dissolved solids will continue at 20 additional triennial wells (List T), with 6 scheduled for 2017. A total of 24 wells will be sampled in June.

If USGS water quality samples for 4N/27W-23E5 result in a 25% increase in chloride concentrations, City project coordinator will be notified immediately via email and sampling will be increased to monthly intervals. If water supply conditions result in increasing pumping of more than 750 AF over a 12 month period from Storage Unit 1, City project coordinator will contact the USGS project coordinator immediately via email.[1]

In recent drought years, the City has increased its pumping in Storage Unit 1, and a 25% increase in chloride concentration has become evident at 4N/27W-23E5. Therefore, sampling for List B which includes specific electrical conductance (Lab code 69), pH (Lab Code 68), and dissolved solids (Lab code 27), and dissolved chloride concentration (Lab Code 1571) will be increased based on the following schedule. Additional List B sampling requested within FY 2016 and FY 2017 are shown below.

2016 Cost per additional List B Sample: $1,981
2017 Cost per additional List B sample: $2,045

	Samples Per Year for List B Constituents							
	FY2016				FY2017			
Monitoring Well	Regular List A Water Quality Sampling	Regular List B Sampling for Seawater Encroachment	Additional List B Sampling for Seawater Encroachment	Total	Regular List A Water Quality Sampling	Regular List B Sampling for Seawater Encroachment	Additional List B Sampling for Seawater Encroachment	Total
4N/27W-23E5:	1	3	2	6	1	3		4
4N/27W-23F2:	1	3	1	5	1	3		4
4N/27W-23F3:	1	3	1	5	1	3		4
4N/27W-23F4:	1	3	1	5	1	3		4
4N/27W-22A2:	1		1	2	1		3	4
4N/27W-22A4:	1		1	2	1		5	6
4N/27W-22G2:	1		1	2	1			1
4N/27W-22G3 (see note):			1	1	1		5	6
4N/27W-22G4 (see note):								
TOTAL SAMPLES:	7	12	9	28	8	12	13	33
Cost for additional List B samples			$17,829				$26,585	

Notes:
Note that regular List A sampling includes List B constituents.
Only wells that are sampled for seawater intrustion are included in the table above. Refer to Table 1 for a comprehensive list of wells sampled for List A.
4N/27W-22G3 is sampled for List A constituents on a trienniel basis, with the next sample occuring in FY2017.
4N/27W-22G4 cannot currently be sampled due to well obstruction. Repair is being evaluated by the City.

[1] City Project Coordinators: Dakota Corey, Water Supply Analyst, dcorey@santabarbaraca.gov; Kelley Dyer, Water Resources Supervisor kdyer@SantaBarbaraCA.gov
USGS Project Coordinators: Stephanie Hamilton, Hydrologic Technician, sahamilton@usgs.gov; Stuart Hill, Field Office Chief, sahill@usgs.gov.

At the request of the City, USGS collected additional samples at 8 wells for List B constituents in October 2016 and a second additional sample at 4N/27W-23E5 during the USGS Fiscal Year 2016 from November 1, 2015 – October 31, 2016. Therefore additional funds have been included in this contract for work performed in USGS Fiscal Year 2016. For the FY 2017 program, the planned additional sampling for seawater encroachment reflects three additional wells: 4N/27W-22A2 (quarterly), 4N/27W-22A4 (every other month), and 4N/27W-22G3 (every other month). In summary, additional funding has been added to cover 9 additional sampling events in FY 2016 additional sampling events and 13 additional sampling events in FY 2017 for List B constituents[2]. Should additional sampling be requested during FY 2017 from November 1, 2016 – October 31, 2017, it will require an amendment to the FY 2017 monitoring contract.

Alternate wells will be sampled in the event it is impossible to sample the primary wells. Alternate wells should be located within the same vicinity of the primary well and within the same storage unit.

See Table 1 for a comprehensive list of regular water level and water quality monitoring schedules. Since Table 1 is intended to reflect the regular monitoring schedule, it does not include the additional List B samples for seawater encroachment monitoring shown in the table above.

The summary of the proposed program for this period and associated costs is as follows:

	Program components	City Funds	USGS Funds	Total Funds
1.	Surface-Water Gaging Stations	$ 61,300	$22,200	$ 83,500
2.	Groundwater Monitoring Water-levels	49,300	3,250	52,550
	Continuous Recorder (4N/27W-8M5)	5,150	2,600	7,750
	Water Quality (Seawater Encroachment Monitoring)	17,350	9,250	26,600
	Additional Sampling in FY16	17,829	-0-	17,829
	Additional Sampling in FY17	26,585	-0-	26,585
	Water Quality (June Samples Table 1)	29,300	14,850	44,150
	TOTAL	**$206,814**	**$52,150**	**$258,964**

Total cost of the proposed program is $258,964. Cost to the City will be $206,814, and subject to the availability of Federal matching funds, the USGS will provide $52,150.

Enclosed are three originals of Joint Funding Agreement (JFA) 17WSCA03700, signed by our agency, for your approval. If you are in agreement with this proposed program, please return one fully executed JFA to our office. Work performed with funds from this agreement will be conducted on a fixed-price basis. Billing for this agreement will be rendered quarterly.

The USGS is required to have an agreement in place prior to any work being performed on a project. We request that a fully executed JFA be returned February 15, 2017. If it is not received by February 15, we will be required to suspend operations until an agreement is received.

[2] If additional sampling is needed, an additional cost of $2,045 per well for each measurement of List B constituents, will be charged through an amendment to the WY2017 agreement. Additional Federal Matching Funds (FMF) are not be available for this work.

Ms. Rebecca Bjork, Public Works Director- City of Santa Barbara

If you have questions regarding this program, please contact Stuart Hill, in our Santa Maria Field Office, at (805) 928-9539. If you have any administrative questions, please contact Tammy Seubert, in our Sacramento Office, at (916) 278-3040.

Sincerely,

Eric G. Reichard
Director, USGS California Water Science Center

Enclosures

cc: Stuart Hill, USGS CAWSC

Table 1 - Water Level and Water Quality monitoring schedule

(M, monthly; A, annual; R, recording; Q, quarterly (March, June, Sept. Dec.)
(XX), sample year; T, triennial); *, alternate
updated per S. Hill & T. Seubert, 07-20-16

	WATER LEVEL	WATER QUALITY		WATER LEVEL	WATER QUALITY
STORAGE UNIT I			4N/27W-19A1	M	-
4N/27W-8R2	M	(16)T	4N/27W-19A2	M	-
4N/27W-9M1	M	-	4N/27W-19A3	M	A
4N/27W-9Q1	M	(18)T	4N/27W-21E1	M	(16)T
4N/27W-13R1	M	-	4N/27W-21E2	M	(18)T
4N/27W-14K2	M	(17)T	4N/27W-21E3	M	(18)T
4N/27W-14P1	M	-	4N/27W-21F1	M	-
4N/27W-15E1	M	-	4N/27W-21F2	M	-
4N/27W-15E2	M	-	4N/27W-21G1	M	-*
4N/27W-15G1	M	-	4N/27W-21G2	M	-*
4N/27W-15J2	M	-	4N/27W-22M1	M	-*
4N/27W-15K1	M	(16)T	4N/27W-22M2	M	-*
4N/27W-16C1	M	(17)T	4N/27W-22Q1	M	-
4N/27W-16C2	M	(16)T			
4N/27W-16R1	M	-	**FOOTHILL**		
4N/27W-17J1	M	(16)T	4N/27W-5P1	M	-
4N/27W-21B1	M	(18)T	4N/27W-7D1	M	(16)T
4N/27W-22A2	M	A	4N/27W-7R3	M	-
4N/27W-22A3	M	(17)T	4N/27W-8E1	M	-
4N/27W-22A4	M	A	San Roque Park #1		
4N/27W-22B6	M	-	4N/27W-8E4	M	-
4N/27W-22B8	M	A	4N/27W-8M5	R	A
4N/27W-22B9	M	A	4N/27W-8M6	M	A
4N/27W-22B10	M	A	4N/27W-18B5	M	(17)T
4N/27W-22B11	M	A	4N/28W-12C2	M	-
4N/27W-22C1	M	-	4N/28W-12H4	M	-
4N/27W-22E1	M	A	4N/28W-12R3	M	-
4N/27W-22E2	M	A			
4N/27W-22G2	M	A	**HOPE RANCH**		
4N/27W-22G3	M	(17)T	4N/27W-18C2	M	(18)T
4N/27W-22G4	M	-	4N/27W-18C3	M	(18)T
4N-27W-23E5	M	A,Q			
4N/27W-23F2	M	A,Q			
4N/27W-23F3	M	A,Q			
4N/27W-23F4	M	A,Q			
4N/27W-23F8	M	A			
4N/27W-23F9	M	A			
STORAGE UNIT III					
4N/27W-17L2	M	(17)T			
4N/27W-17L3	M	(18)T			
4N/27W-17L4	M	(16)T			
4N/27W-17L5	M	-			
4N/27W-18Q1	M	-			
4N/27W-18Q4	M	-			

Ms. Rebecca Bjork, Public Works Director- City of Santa Barbara

List A

Chemical Constituents
(mg/L or as indicated)

Dissolved aluminum (μg/L)

Dissolved arsenic (μg/L)

Dissolved barium (μg/L)

Dissolved boron (μg/L)

Dissolved bromide

Dissolved calcium

Dissolved chloride

Dissolved fluoride

Dissolved iodide

Dissolved iron (μg/L)

Dissolved lithium (μg/L)

Dissolved manganese (μg/L)

Dissolved magnesium

Dissolved nitrogen (nitrate + nitrite)

Dissolved orthophosphate (PO_4)

Dissolved orthophosphorus (P)

Dissolved potassium

Dissolved silica

Dissolved sodium

Dissolved strontium (μg/L)

Dissolved sulfate

Dissolved solids (sum)

Sodium adsorption ratio

Percent sodium

Total alkalinity ($CaCO_3$)

Total hardness ($CaCO_3$)

Temperature °C

pH

Specific Conductance (μS/cm)

Stable isotopes

Schedules used: 101 (nutrients), 1261 (major ions and trace), 1142 (stable isotopes)

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List B

Chemical Constituents
(mg/L or as indicated)

pH

Specific Conductance (microsiemens)

Dissolved Chloride

Dissolved solids (sum)

Lab Codes used: 68, 69, 1571, 27

Ms. Rebecca Bjork, Public Works Director- City of Santa Barbara

List T

Triennial Sampling Wells

(updated list 07-20-2016 by S. Hill & T. Seubert USGS)

Site Name	Site Identification Number	2016	2017	2018	2019
STORAGE UNIT I					
4N/27W-8R2	342618119432501				
4N/27W-9Q1	342618119423701				
4N/27W-14K2	342534119404301				
4N/27W-15K1	342538119413401				
4N/27W-16C1	342603119430401				
4N/27W-16C2	342603119430402				
4N/27W-17J1	342541119433501				
4N/27W-21B1	342506119423801				
4N/27W-22A3	342506119412202				
4N/27W-22G3	342455119412402				
STORAGE UNIT III					
4N/27W-17L2	342533119435501				
4N/27W-17L3	342533119435502				
4N/27W-17L4	342533119435503				
4N/27W-21E1	342502119431401				
4N/27W-21E2	342502119431402				
4N/27W-21E3	342502119431403				
FOOTHILL					
4N/27W-7D1	342647119451701				
4N/27W-18B5	342606119445201				
HOPE RANCH					
4N/27W-18C2	342600119445201				
4N/27W-18C3	342600119445202				