



# United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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November 17, 2015

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, 2015 to October 31, 2016.

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:

<u>Station number and name</u>	<u>City Funds</u>	<u>USGS Funds</u>	<u>Total Funds</u>
11119745 Mission Creek near Rocky Nook Park	\$14,250	\$ 7,200	\$21,450
11122000 Santa Ynez above Gibraltar Dam	14,250	7,200	21,450
11123000 Santa Ynez below Gibraltar Dam	14,250	7,200	21,450
11121900 Gibraltar Dam Diversion Weir at Gibraltar	8,300	-0-	8,300
11122010 Gibraltar Release Dam Weir at Gibraltar Dam	<u>8,300</u>	<u>-0-</u>	<u>8,300</u>
<b>Subtotal</b>	<b>\$59,350</b>	<b>\$21,600</b>	<b>\$80,950</b>

## **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.

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**Water-quality monitoring:**

The USGS will continue to operate a groundwater quality monitoring network per the plan started in 1989. Quarterly sampling will be completed at four wells during the months of March, June, September, and December as listed in Table 1. Samples will consist of pH (Lab Code 68), specific electrical conductance (Lab Code 69), dissolved solids (Lab Code 27) and dissolved chloride concentration (Lab Code 1571) as outlined in List B. June samples for these four wells however, will consist of chemical constituents outlined in List A. A total of twelve yearly samples will be collected at the following four monitoring wells:

- a. 4N/27W-23E5
- b. 4N/27W-23F2
- c. 4N/27W-23F3
- d. 4N/27W-23F4

If a 25% increase in chloride concentration is evident at 4N/27W-23E5, two additional wells located further inland (north) will be added to the quarterly sampling program, and sampling will increase to monthly intervals at a total of six monitoring wells. The two additional wells are 4N/27W-22A4 and 4N/27W-22G2.<sup>1</sup>

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.<sup>2</sup>

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 7 wells scheduled for 2016. A total of 25 wells will be sampled in June.

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 water level and water quality monitoring schedules.

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<sup>1</sup> If additional sampling is needed, an additional cost of \$1,981 per well for each measurement of List B constituents, will be charged to the WY2017 agreement. Additional Federal Matching Funds (FMF) may not be available for this work.

<sup>2</sup> City Project Coordinator: Kelley Dyer, Water Resources Supervisor [kdyer@SantaBarbaraCA.gov](mailto:kdyer@SantaBarbaraCA.gov)  
USGS Project Coordinators: Matthew Melchiorsen, Hydrologic Technician, [mattm@usgs.gov](mailto:mattm@usgs.gov); Matthew Scrudato, Groundwater Specialist, [scrudato@usgs.gov](mailto:scrudato@usgs.gov); Stuart Hill, Field Office Chief, [sahill@usgs.gov](mailto:sahill@usgs.gov).

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

<u>Program components</u>	<u>City Funds</u>	<u>USGS Funds</u>	<u>Total Funds</u>
1. Surface-Water Gaging Stations	\$ 59,350	\$21,600	\$ 80,950
2. Groundwater Monitoring Water-levels	43,350	3,150	46,500
Continuous Recorder (4N/27W-8M5)	5,000	2,500	7,500
Water Quality (Seawater Encroachment Monitoring)	16,800	8,950	25,750
Water Quality (June Samples Table 1)	<u>28,400</u>	<u>14,400</u>	<u>42,800</u>
<b>TOTAL</b>	<b>\$152,900</b>	<b>\$50,600</b>	<b>\$203,500</b>

Total cost of the proposed program is \$203,500. Cost to the City will be \$152,900, and subject to the availability of Federal matching funds, the USGS will provide \$50,600.

Enclosed are three originals of Joint Funding Agreement (JFA) 16WSCA03700, 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 December 31, 2015. If it is not received by December 31, we will be required to suspend operations until an agreement is received.

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

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

**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 M.C. Scrudato, City, 06-09-14*

	<b>WATER LEVEL</b>	<b>WATER QUALITY</b>		<b>WATER LEVEL</b>	<b>WATER QUALITY</b>
<b>STORAGE UNIT I</b>					
			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	-	<b>FOOTHILL</b>		
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	<b>HOPE RANCH</b>		
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			
<b>STORAGE UNIT III</b>					
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	-			

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**List A**

Chemical Constituents  
(mg/L or as indicated)

Dissolved aluminum ( $\mu\text{g/L}$ )	Dissolved sodium
Dissolved arsenic ( $\mu\text{g/L}$ )	Dissolved strontium ( $\mu\text{g/L}$ )
Dissolved barium ( $\mu\text{g/L}$ )	Dissolved sulfate
Dissolved boron ( $\mu\text{g/L}$ )	Dissolved solids (sum)
Dissolved bromide	Sodium adsorption ratio
Dissolved calcium	Percent sodium
Dissolved chloride	Total alkalinity ( $\text{CaCO}_3$ )
Dissolved fluoride	Total hardness ( $\text{CaCO}_3$ )
Dissolved iodide	Temperature $^{\circ}\text{C}$
Dissolved iron ( $\mu\text{g/L}$ )	pH
Dissolved lithium ( $\mu\text{g/L}$ )	Specific Conductance ( $\mu\text{S/cm}$ )
Dissolved manganese ( $\mu\text{g/L}$ )	Stable isotopes
Dissolved magnesium	
Dissolved nitrogen (nitrate + nitrite)	
Dissolved orthophosphate ( $\text{PO}_4$ )	
Dissolved orthophosphorus (P)	
Dissolved potassium	
Dissolved silica	

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

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**List T**

Triennial Sampling Wells

(updated list 06/09/2014 by M. Scrudato, USGS)

Site Name	Site Identification Number	2015	2016	2017	2018
<b>STORAGE UNIT I</b>					
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			■	
<b>STORAGE UNIT III</b>					
4N/27W-17L2	342533119435501			■	
4N/27W-17L3	342533119435502	■			■
4N/27W-17L4	342533119435503		■		
4N/27W-21E1	342502119431401		■		
4N/27W-21E2	342502119431402	■			■
4N/27W-21E3	342502119431403	■			■
<b>FOOTHILL</b>					
4N/27W-7D1	342647119451701		■		
4N/27W-18B5	342606119445201			■	
<b>HOPE RANCH</b>					
4N/27W-18C2	342600119445201	■			■
4N/27W-18C3	342600119445202	■			■