



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Arizona Water Science Center
520 North Park Avenue, Suite 221
Tucson, Arizona 85719

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(520) 670-6671 FAX (520) 670-5592
<http://az.water.usgs.gov/>

December 15, 2017

6000000801/AZ042
Arlethe Rios, Clerk
Cochise County Board of Supervisors
1415 Melody Lane, Building G
Bisbee, Arizona 85603

Dear Ms. Rios:

Enclosed are two copies of Joint Funding Agreement (JFA) No. 2 between the Cochise County Board of Supervisors and the U.S. Geological Survey for the period of October 1, 2017 to September 30, 2018. The purpose of this agreement is to conduct hydrologic investigations and data collection. Billing will be on a quarterly basis, and the bills will be mailed upon receipt of signed agreement in December, March, June and August. Work performed with funds from this agreement will be conducted on a fixed-price basis.

The results of all work under this agreement will be available for publication by the USGS. Please return a signed copy of the JFA to this office. If you have any questions, please contact Bruce Gungle at (520) 671-6671 ext 233.

Sincerely,

James M. Leenhouts
Director

Enclosures (2)

**U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Customer #: 6000000801/AZ042
Agreement #: 18CMAZ05900
Project #: ZF009GO
TIN #: 86-6000398
Fixed Cost Agreement YES

JOINT FUNDING AGREEMENT

FOR

WATER RESOURCES INVESTIGATIONS

THIS AGREEMENT is entered into as of the, 15th day of December, 2017 by the U.S. GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the COCHISE COUNTY BOARD OF SUPERVISORS, party of the second part.

1. The parties hereto agree that subject to availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation a program of hydrologic investigations and data collection as described in the attached scope of work herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50; and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) includes In-Kind Services in the amount of \$0.00

(a) by the party of the first part during the period

Amount	Date	to	Date
\$34,500.00	October 1, 2017		September 30, 2018

(b) by the party of the second part during the period

Amount	Date	to	Date
\$70,400.00	October 1, 2017		September 30, 2018

Total: \$104,900.00

(c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of:

Description of the USGS regional/national program:

(d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

- 7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.
- 8. The maps, records, or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records, or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program and, if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at costs, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records, or reports published by either party shall contain a statement of the cooperative relations between the parties.
- 9. USGS will issue billings utilizing Department of the Interior Bill for Collection (form DI-1040). Billing documents are to be rendered quarterly. Payments of bills are due within 60 days after the billing date. If not paid by the due date, interest will be charged at the current Treasury rate for each 30 day period, or portion thereof, that the payment is delayed beyond the due date. (31 USC 3717; Comptroller General File B-212222, August 23, 1983).

**U.S. Geological Survey
United States
Department of the Interior**

Cochise County Board of Supervisors


USGS Point of Contact

Customer Point of Contact

Name: James M. Leenhouts
 Address: Arizona Water Science Center
 520 N. Park Ave., #221
 Tucson, AZ 85719
 Telephone: 520-670-6671 x278
 Email: leenhout@usgs.gov

Name: Arlethe Rios, Clerk of the Board
 Address: Cochise County Floodplain Dept.
 1415 Melody Lane, Building F
 Bisbee, AZ 85603
 Telephone: 520-432-9200
 Email: arios@cochise.az.gov

Signatures and Date

Signature:		Date:	12/15/17	Signature:	_____	Date:	_____
Name:	James M. Leenhouts	Name:		Name:		Title:	Chairman, Board of Supervisors
Title:	Director	Title:		Title:		Title:	Chairman, Board of Supervisors

Scope of Work

Agreement # **18CMAZ05900**, between USGS and Cochise County

For Federal fiscal year 2018, the funds from this agreement will cover ongoing hydrologic monitoring in the Sierra Vista Subwatershed of the Upper San Pedro Basin. This work has specific bearing on monitoring the hydrologic system with respect to attaining a sustainable yield of groundwater withdrawals in accordance with the goals of the Upper San Pedro Partnership (http://www.usppartnership.com/press_mission.htm). In addition, the information obtained through this basic monitoring is critical to verifying the predictive performance of groundwater modeling of the Sierra Vista Subwatershed.

The cost of running the gaging stations and most of the other activities has increased this year by 9% (\$8,500 total). The USGS will contribute \$34,500 to the agreement, or about 33% of the total cost. The specifics of the work are listed below.

1. Operation of the Lewis Springs study site. The Lewis Springs site, located just north of where Arizona Route 90 crosses the San Pedro River, has been operating about 23 years. This site has provided some of the most complete information available on the San Pedro River regarding interactions between the regional aquifer system and the perennial San Pedro River reaches. The long period of continuous record at this site makes it particularly valuable for detecting changes in effects of regional-aquifer pumping on the river. Instrumentation at the site includes 6 piezometers at three locations along a line extending perpendicularly away from the river. Two locations have nested piezometers that measure vertical hydraulic gradients from the regional to the stream-alluvium aquifer. The site also records stream stage so the hydraulic gradient to the river may be calculated. To visit the web page for this site navigate to: <http://az.water.usgs.gov/projects/9671-9GO/>
2. Operation of tributary stream-gaging stations. Mountain-front, low-flow stream-gaging stations provide information about the amount of mountain-front recharge that is taking place in the Subwatershed. Flows result from both snowmelt in the winter and spring and from storm runoff during the summer months. Low-flow stream gaging also provides a means of assessing long-term climate change effects on the Subwatershed, if any. Major tributary stream-gaging stations help quantify the tributary contribution to San Pedro River surface flow.
 - a) The Banning Creek stream-gaging station is located about a mile up Banning Creek toward Bisbee from the intersection of U.S. Routes 80 and 90, and is the only gaging station on the east side of the Subwatershed upstream of Walnut Gulch. Banning Creek is one of the larger watersheds in the Mule Mountains. The Banning Creek discharge record is over 16 years old, beginning in February of 2001. To visit the web page for this station navigate to: http://waterdata.usgs.gov/az/nwis/uv/?site_no=09470700&PARAMeter_cd=00065,00060
 - b) The Ramsey Canyon stream-gaging station is located in the Huachuca Mountains at the top of Ramsey Canyon Road, adjacent to The Nature Conservancy's Ramsey Canyon preserve headquarters building. Ramsey Canyon is one of a series of significant watersheds that drain the higher elevations of the Huachuca Mountains and is the southernmost gaging station on the west side of the Subwatershed. The Ramsey Canyon discharge record is over 17 years old, beginning

in May of 2000. To visit the web page for this station navigate to:

http://waterdata.usgs.gov/az/nwis/uv/?site_no=09470750&PARAMeter_cd=00065.00060

- c) The Upper Babocomari stream-gaging station is located on the Babacomari Ranch about 4 miles west of Arizona Route 90. The Babocomari River is perennial in stretches and is the primary tributary stream in the Upper San Pedro basin. The Babocomari is essentially perennial at the Upper Babocomari gaging station. In combination with the Lower Babocomari gaging station (funded by other USGS partners), these gaging station data help to quantify the contribution from the Babocomari River to the surface flow of the San Pedro River as well as to increase understanding of the groundwater – surface water interactions along the intervening reach of the Babocomari River. The Upper Babocomari discharge record is over 17 years old, beginning in July of 2000. To visit the web page for this station navigate to:

http://waterdata.usgs.gov/az/nwis/uv/?site_no=09471380&PARAMeter_cd=00065.00060

3. Collection of stream samples and analysis of stable isotopes of water. The stable isotopes of water provide a sensitive indicator of water sources in a stream. Some of the funds in this agreement will be used to support an ongoing program initiated in the mid-1990s at most locations to collect and analyze these isotopes. The collection locations along the San Pedro River are Palominas, Hereford, Lewis Springs, Charleston, and Tombstone. Samples are also collected from the Babocomari River at the Lower Babocomari gaging station near Tombstone, AZ (station number 09471400). Samples are collected 8 to 12 months a year, depending upon conditions, and the procedure includes measurements of electrical conductivity and stream discharge. Collectively, these data provide valuable information regarding the interactions between the regional-aquifer system and the flow in the San Pedro River. In addition, the isotopes are used to look for changes in the relative sources of water to the stream as would occur if regional ground-water pumping captures water that would otherwise have supported base flow.
4. Spring discharge measurements. Groundwater discharges from the subsurface not only through the river streambed, but also through various springs adjacent to the river along its length. Discharge is to be measured quarterly at five springs, three along the west side of the river (Horsethief, 6 years beginning 2011; Murray, 14 years, beginning 2003; and Moson Springs, 6 years beginning 2011) and two on the east side of the river (Lewis Spring, 6 years beginning 2011; McDowell-Craig Farm flowing well, 6 years beginning 2011).
5. Data management and other activities. In addition to the activities outlined above, the USGS is engaged in other hydrologic monitoring activities including water level monitoring in wells throughout the Sierra Vista Subwatershed (continuous automated transducer measurements and manual quarterly measurements), vertical gradients monitored in paired deep and shallow piezometers near to the river and used to establish gaining and losing reaches of the river, and additional tributary and main stem stream gaging. All of these data need to be compiled, quality assured and controlled, and entered into the USGS national database in a timely fashion. The USGS also participates in various Upper San Pedro Partnership meetings and activities throughout the year and responds to data and information requests from Partnership members.

Budget for federal FY 2018

Agreement #18CMAZ05900, between USGS and Cochise County

Task	Cost item	Cost (in dollars)
Operation of Lewis Springs monitoring site	Data collection/site operation	17,400
Operation of Banning Creek stream gaging station	Data collection/site operation	17,400
Operation of Upper Babocomari stream gaging station	Data collection/site operation	17,400
Operation of Ramsey Canyon stream gaging station	Data collection/site operation	17,400
Collection of stream samples and analyses of stable isotopes of water	Labor	6,800
	Lab analyses	9,000
	Equipment	700
	Shipping	700
Spring discharge measurements	Data collection, 5 springs	6,100
Data management and other activities	Subwatershed data management/entry; data and information requests	12,000
Total of project cost items		104,900

Funding source – USGS	34,500
Funding source – Cochise County	70,400
Total project funding	104,900

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GEOLOGICAL SURVEY**

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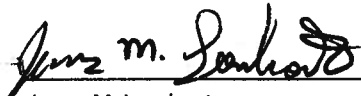
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Funding source – USGS	34,500
Funding source – Cochise County	70,400
Total project funding	104,900