



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Oregon Water Science Center

2130 SW 5th Avenue

Portland, OR 97201

(503) 251-3220 • Fax: (503) 251-3470

<http://or.water.usgs.gov/>

November 1, 2012

Mr. Mike Benedict, Director
Community Development
Hood River County
601 State Street
Hood River, OR 97031

Dear Mr. Benedict:

Two copies of a Joint Funding Agreement (JFA) between the U.S. Geological Survey (USGS) and Hood River County are enclosed for technical guidance for the Hood River Valley Groundwater Study as described in the attached proposal.

Total cost for this program in Federal fiscal year 2013 (October 1, 2012, through September 30, 2013) is \$21,667 of which Hood River County will provide \$13,000 and the USGS will provide \$8,667 in Federal Matching Funds.

If these terms are agreeable to the County, we ask that you sign both copies of the enclosed JFA and return one fully signed copy to this office. The signed agreement is our legal authority that permits this work to be performed and which authorizes USGS to accept funds.

Funds are not required at this time; a signed agreement is not a bill, only an agreement to pay for the work that will be done. The Water Resources Cooperative Program operates under the authority of statute 43 USC 50, which allows us to perform this work. The Oregon Water Science Center DUNS number is 137883463.

Billing will be annual on a fixed-price basis in early July 2013, or at an earlier time requested. The results of all work done under this agreement will be available for publication by the USGS.

We look forward to our successful partnership with Hood River County. If you have any questions concerning this letter or the project in general, please feel free to call Terrence Conlon of this office at (503) 251-3232

Sincerely,

A handwritten signature in black ink, appearing to read "James D. Crammond". The signature is fluid and cursive, with a large initial "J" and "C".

James D. Crammond
Center Director

Enclosures:
Proposal
2 JFA's w/return envelope

Cc:
James D. Crammond
Mary Burbank
Steve Winkler
Terrence Conlon

Form 9-1366
(Oct. 2005)

**U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement**

Customer #:

Agreement #:

Project #:

TIN #:

Fixed Cost
Agreement

Page 1 of 2

93-6002297

 Yes No

**FOR
OREGON WATER SCIENCE CENTER**

THIS AGREEMENT is entered into as of the 1st day of November, 2012, by the U.S. GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the HOOD RIVER COUNTY, 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 technical guidance for the Hood River Valley Groundwater Study, Hood River County, Oregon, 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.

(a) \$8,667 by the party of the first part during the period
November 9, 2012 to September 30, 2013

(b) \$13,000 by the party of the second part during the period
November 9, 2012 to September 30, 2013

(c) 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.

(d) 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.

Form 9-1366
continued

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement

Customer #:
Agreement #:
Project #:
TIN #: 93-6002297

- 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 **annually**. 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

HOOD RIVER COUNTY

USGS Point of Contact

Customer Point of Contact

Name: Terrence Conlon
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Email: tdconlon@usgs.gov

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601 State Street
Hood River, OR 97031
Telephone: 541-387-6868
Email: mike.benedict@co.hood-river.or.us

Signatures

Signatures

By  Date 11/1/12
Name: James D. Crammond
Title: Center Director

By  Date 11-6-12
Name: David Meriwether
Title: County Administrator

By _____ Date _____
Name:
Title:



Technical Guidance for the Hood River Valley Groundwater Study, Hood River County, Oregon

Prepared by:

Terrence D. Conlon (tdconlon@usgs.gov)
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Prepared for:

Hood River County

October 25, 2012

Technical Guidance for the Hood River Valley Groundwater Study, Hood River County, Oregon

Problem/Background

Hood River valley is a vibrant agricultural area in which fruit orchards are a dominant land use. The area is also habitat for several endangered species, including steelhead, bull trout and Chinook and coho salmon (U.S. Bureau of Reclamation, 2012). Surface water is the main source of irrigation with surface water diversions from the mainstem of the Hood River and streams in the West Fork Hood River watershed by the Farmers Irrigation District, and from the East Fork Hood River by the East Fork Irrigation District. Diversions by the Farmers Irrigation District also provide water for hydroelectric power production. During the dry summer months, streamflow may be below levels necessary to meet irrigation and instream (for fish) needs. Groundwater, typically used for domestic supply, is being considered as a source of water for irrigation or to augment streamflow.

The aquifers in the Hood River Valley consist of sedimentary, volcanoclastic, and andesitic or basaltic aquifers. The groundwater resources of the area have not been studied in detail in part because groundwater use is small compared to surface water and spring discharge. In a 1996 study, the groundwater resources of the valley were reported as relatively undeveloped. Major springs in the Hood River valley were inventoried and described, and the potential for groundwater development of the Columbia River Basalt Group discussed (Sceva, 1996). In 1983, groundwater pumped from aquifers supplied 203 acre feet of water: 140 acre feet for irrigation, 44 acre feet for public supply, 2 acre feet for industrial/commercial use, and 17 acre feet for domestic use. However, groundwater production is relative small compared to water supplied by surface water and springs (Grady, 1983). Productive wells were reported in the unconsolidated sediments adjacent to the Columbia River and in the Columbia River Basalt aquifer north of Dee Flat.

To plan for the county's future water needs, Hood River County and the U.S. Bureau of Reclamation (Reclamation) are conducting a study to

- Define current and future basin water supply and demands, with consideration of potential climate change impacts.
- Determine the potential impacts of climate change on the performance of current water delivery systems (e.g. infrastructure and operations).
- Develop options to maintain viable water delivery systems for adequate water supplies in the future.
- Conduct a tradeoff analysis of the options developed, summarize findings and make recommendations on preferred options.

One component of the study, relating to options to maintain an adequate water supplies in the future, involves improving the understanding of the groundwater flow system and developing tools to evaluate the effects of groundwater pumping on aquifer and stream levels and flow, impacts of climate on groundwater conditions, and feasibility of artificial recharge in the winter to support summer irrigation or discharge to streams. Reclamation will develop a numerical

groundwater flow model to test the conceptual understanding of groundwater flow and conditions in the basin and evaluate the effects of artificial recharge and groundwater pumping on streamflow and the aquifer. Reclamation and Hood River County requested the U.S. Geological Survey (USGS) provide support in developing a conceptual understanding of groundwater flow and the interaction of surface and ground waters, and to assist Reclamation in the development of a numerical groundwater flow model.

USGS will provide staff resources to work with Hood River County and Reclamation on the development of a conceptual understanding of the hydrogeology and a numerical groundwater flow model. Reclamation will be responsible for development and calibration of the model, and using the model for simulating climate and pumping scenarios. USGS will provide technical advice during all phases of the model development, calibration, and use, as funding permits.

Objectives

The overall objective of the study is to provide technical guidance in support of understanding groundwater flow and the interaction of groundwater and surface water in the Hood River valley.

Approach

To achieve the objective of the study, USGS proposes to provide technical guidance in support of developing an understanding of the groundwater flow system and developing a tool, a groundwater flow model, to assist the county in managing the water resources of the county. This will be done through meetings, conference calls, WebEx meetings, and review of plans, interim products, and reports.

Reclamation is developing a MODFLOW groundwater flow model as a tool to test assumptions of groundwater flow in the valley and evaluate water resource management scenarios, such as the effect on streamflow of groundwater pumping and aquifer recharge. USGS will provide technical advice to Hood River County and Reclamation on model development including evaluation of methods used to determine aquifer geometry, recharge, groundwater pumping, and stream-groundwater interactions. USGS involvement can include telephone calls, meetings, field visits, related travel, and review of literature, data, model input and simulations.

Products

No final product is planned for groundwater model development guidance. The results of USGS technical guidance will be incorporated into the final groundwater flow model developed by Reclamation.

Funding/ Personnel/Schedule

The funding below assumes \$13,000 is initially contributed by Hood River County and USGS contributes matching funds of \$8,667. Hood River County will hold \$7,000 in reserve should there be need for additional USGS services beyond those provided with the initial funding of \$13,000. If the additional \$7,000 is used in this study, USGS intends to contribute an additional \$4,667, assuming USGS matching funds are still available.

GW model technical guidance

Funding Sources	FY2013
Hood River County	\$13,000
USGS Cooperative Water Program	\$8,667
Total	\$21,667

Personnel (Oregon Water Science Center)	FY2013
GS-12 Hydrologist	14 days
GS-13 Hydrologist	5 days

Workplan Schedule	Nov '12	Dec '12	Jan '13	Feb '13	Mar '13	Apr '13
Technical guidance on groundwater modeling						

References

Grady, S.J., 1983, Ground-water resources in the Hood Basin, Oregon: U.S. Geological Survey Water-Resources Investigations Report 81-1108, 68 p.

Marshall, R.B., 1914, Profile surveys in Hood and Sand River basins, Oregon: U.S. Geological Survey Water Supply Paper 348 [<http://pubs.er.usgs.gov/publication/wsp348>]

Sceva, J.E., 1966, A reconnaissance of the ground-water resources of the Hood River Valley and the Cascade Locks area, Hood River County, Oregon: Oregon Water Resources Department Ground Water Report no. 10, 45 p.
 [http://www.oregon.gov/owrd/gw/docs/gw_report_10_hood_river.pdf]

U.S. Bureau of Reclamation, 2012, Hood River Basin, Oregon Water Supply and Demand Study: U.S. Bureau of Reclamation fact sheet
 [http://www.usbr.gov/WaterSMART/bsp/docs/fy2011/Final_Factsheet_HoodRiver.pdf]