

**Collaborative Approach to Management of the
Upper Verde River Watershed:
Expansion of the Upper Verde River Watershed
Protection Coalition**

**Notice of Funding Opportunity
R12SF80035**

Upper Verde River Watershed Protection Coalition

**7501 East Civic Circle
Prescott Valley, AZ 86314**

July 9, 2012

**Co- Project Manager: John Munderloh
Phone: 928-759-3105
Fax: 928-583-6905
jmunderloh@pvaz.net**

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TECHNICAL PROPOSAL

Applicant:

Date – July 9, 2012

Name – Upper Verde River Watershed Protection Coalition (UVRWPC), fiscal agent Town of Prescott Valley

(3) Technical Proposal

Applicant Eligibility: The UVRWPC, located in Yavapai County of central Arizona, is requesting Reclamation funding to expand an existing watershed group. Established by formal intergovernmental agreement in 2006, the Coalition is a consensus-based regional association of local governments including Yavapai County; City of Prescott; Yavapai-Prescott Indian Tribe; and Towns of Prescott Valley, Dewey-Humboldt and Chino Valley. Dewey-Humboldt has since withdrawn from the partnership citing financial constraints.

Coalition partners and the residents and businesses that live and work within UVRWPC boundaries are significantly affected by quantified groundwater shortfalls. Assuring water availability for the future has been the driving force behind all actions, agreements and adjudication undertaken by water resource professionals and governing bodies over the last three decades, since the Prescott Active Management Area (PrAMA), located within the geographic boundaries of the Upper Verde River Watershed, was designated under the Groundwater Management Act of 1980. The UVRWPC has the collective resources to successfully conduct outreach to expand the current watershed group, as well as research, investigate, plan, and make policy and project recommendations to decision-making bodies that have authority with respect to the watershed.

UVRWPC was organized with a recorded goal to “protect the base flow of the Upper Verde River while balancing the reasonable water needs of residents who live and businesses that operate within the watershed boundaries.” A resolution authorizing an initiative to expand the existing watershed group (*attached in the Appendix portion of this proposal*) was unanimously approved by the Executive Board in March 2011. Two preliminary meetings have been held and there is broad-based support for the effort. Potential stakeholders include Prescott National Forest, National Resource Conservation District, ranchers and agricultural producers, Arizona Department of Water Resources, Arizona Game and Fish Department, private non-profit environmental organizations, citizens at large, holders of mining claims, members of industry, economic development organizations, chambers of commerce, small volunteer fire departments, and private landowners.

Goals: Preliminary goals include information gathering on current watershed conditions, including ongoing projects, and GIS mapping; outreach to stakeholders to expand the existing watershed group; media relations to inform the public; development of a mission statement with assistance from a meeting facilitator; determination of problems and needs within the watershed and formulation of project concepts; and writing of a watershed restoration and implementation plan, as well as the final report to Reclamation.

Burgess & Niple Engineering, an international firm with a century-long history and identified in 2007 through a competitive bid process, will serve as watershed coordinator. John Munderloh, water resources manager for the Town of Prescott Valley and chair of the Coalition TAC will serve as the project manager and Reclamation liaison. Chair of the expanded watershed group will be identified after the final group is organized.

Approach: Outreach to expand stakeholder membership will be conducted in the first 60 days of the project period and include Coalition TAC members one-on-one contact with potential stakeholders, attendance at board meetings, and development of an introductory letter, a fact sheet, multi-media presentation, press release(s), and information posting on the Coalition website. An outreach plan currently is under development and will be completed prior to start of the project period with implementation of a grant agreement with Reclamation. Plans include finalization of expanded group membership by the end of the first 60 days. This will be a large group of stakeholders and it is anticipated that subcommittees with specific assigned tasks will be required in order meet project goals.

Information gathering will begin 30 days into the project period and continue for 90 days including research on current watershed conditions and GIS mapping. GIS services will be provided by Coalition partners the Town of Prescott Valley and Yavapai County.

A meeting facilitator will be hired two and a half months into the project to assist the expanded watershed group in developing a formal mission statement to begin 90 days after project start. The membership will participate in three, ½ day workshops over the next 90 days to develop a formal mission statement with assistance from the meeting facilitator.

Project milestone: After the first six months tasks that will be completed include outreach to expand the group and finalize membership, information gathering on current watershed conditions, GIS mapping and development of a mission statement.

Following development of a mission statement, the watershed coordinator will begin working with the group and the expanded membership to identify problems and needs across the watershed, and development of project concepts. This will require an estimated six months to complete

Project milestone: In addition to tasks that were completed during the first six months of the project period, tasks that will be completed after the first year include identification of problems and needs, and finalization of project concepts.

A watershed restoration plan with implementation schedule will be written in the second year of the project period. Upon project conclusion, members of the expanded watershed group will have a comprehensive watershed restoration plan that not only delineates steps for implementation, but also includes justification, cost estimates and opportunities for continued funding. Public communication will continue throughout the project with press releases submitted to electronic and print media no less than quarterly. Estimated completion date is September 30, 2014.

Project milestone: Finalization of water restoration plan and implementation schedule; final report to Reclamation by September 30, 2014.

(4) Technical Proposal: Background Data

Location - The proposed project will be implemented in central Yavapai County, Arizona.

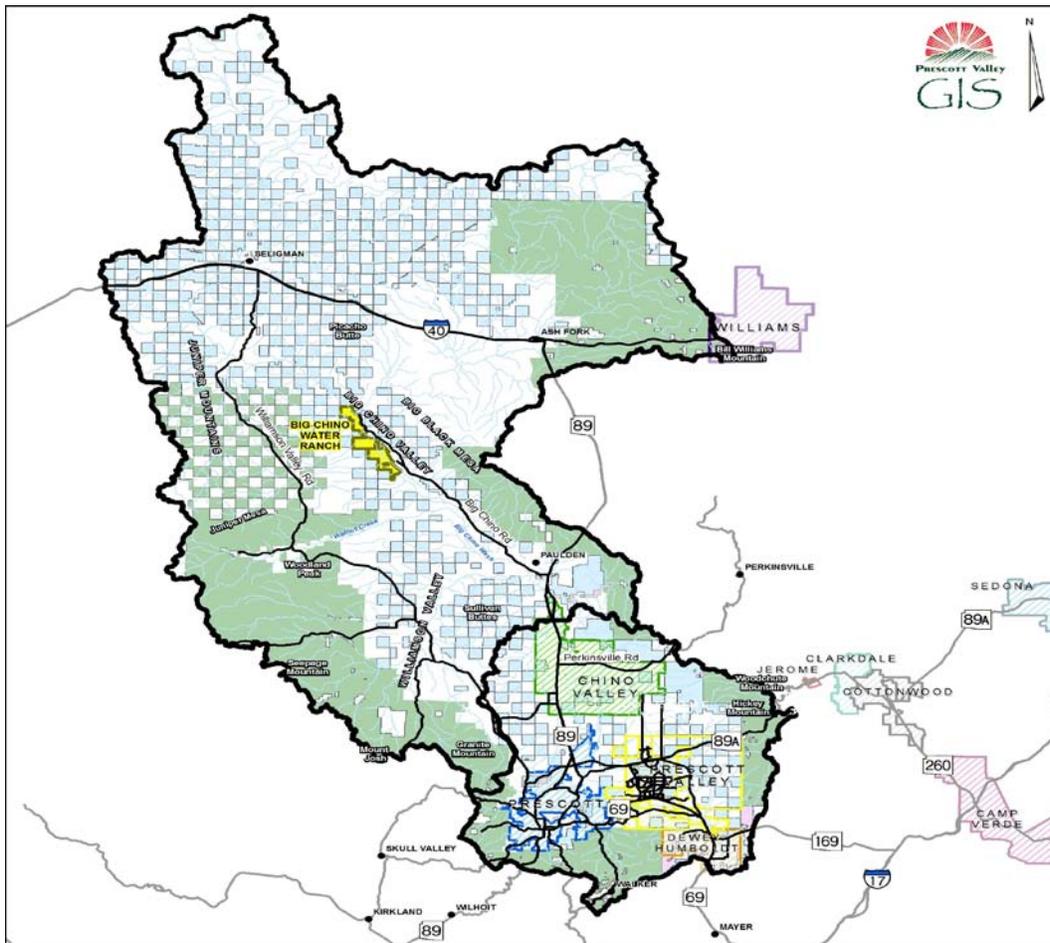


Illustration 1: Upper Verde River Watershed Protection Coalition: Project Area

Water use, current and projected demand - Water is delivered to end users through municipal suppliers, private water companies, and exempt wells. Primary consumption is by residential and commercial users. Irrigation within the service area does not constitute a primary use of supplies.

An estimated 125,000 water users live and/or work in the project area, including the unincorporated areas of Yavapai County. There are a combined 39,400 municipal service connections and 12,000 independent private service and exempt wells. Regional use, on average, is 156 gallons per capita per day.

Current annual groundwater withdrawals within the project area are 16,036 a.f.y. representing an estimated 7,036 a.f.y. of overdraft; the long term average overdraft is estimated at 10,000 a.f.y. Demand from all water supplies for municipal and commercial use is 17,946 a.f.y., including exempt wells; 1,218 a.f.y. for industrial use; and 2,455 a.f.y. for agricultural use (Arizona Department of Water Resources 2010 Draft Demand & Supply Assessment – a precursor to the Prescott Active Management Area 4th Management Plan scheduled to be released in draft form in September 2012).

Source of water supply - Current available water supplies include groundwater, surface water and effluent.

- Groundwater is drawn from the Little Chino and Upper Aqua Fria sub-basins within the Prescott Active Management Area (PrAMA).
 - The PrAMA is an actively managed groundwater basin administered under the 1980 Groundwater Management Act.
 - Approximate annual groundwater withdrawals are 16,000 acre-feet per year (a.f.y.)
 - Approximate long-term annual recharge potential through precipitation capture is 4,500 a.f.y.
 - Average annual overdraft is 7,000 a.f.y.
- Surface Water in the PrAMA (useable supplies)
 - Watson and Willow Reservoirs – approximately 1,100 a.f.y.
 - Lynx Lake – approximately 200 a.f.y.
- Reclaimed Water (effluent)
 - City of Prescott – approximately 4,000 a.f.y.
 - Town of Prescott Valley – approximately 2,200 a.f.y.
 - Town of Chino Valley – approximately 50 a.f.y.

Water rights involved –Water rights within the PrAMA fall under major categories governed by Arizona Water Law.

- Groundwater rights – access strictly controlled by Arizona Department of Water Resources (ADWR) provisions include:
 - Goal of reaching Safe Yield by 2025 (balancing the amount withdrawn by the amount recharged);
 - No new residential or commercial subdivisions are allowed to access the groundwater supplies in the PrAMA (since 1999); and
 - Water conservation mandates.
- Surface water rights –
 - Governed by the Doctrine of Prior Appropriation
 - Defined as water on the surface of the ground flowing in defined stream channels or subsurface water that is connected to and part of a flowing stream.
 - Although Prescott is the oldest non-Indian community north of the Gila River, most surface water supplies in the area have been

appropriated by downstream users, primarily the Salt River Reclamation Project.

- Reclaimed water (effluent) –
 - Administration is primarily governed by Arizona Supreme Court cases Long vs. APS and Long vs. City of Phoenix.
 - It is partially administered by the groundwater code as an alternative to groundwater.
 - Unlike other types of water in Arizona, effluent is “owned” by the entity that produces it, unlike surface water and groundwater that is owned by the State and loaned to the user
 - Within the PrAMA, almost all available effluent is directly used for irrigation or is recharged to the aquifer.
- Rainwater or sheet flow -
 - Rainwater or sheet flow is not an appropriable source of water in Arizona as long as it is collected prior to reaching a defined stream channel.
 - Arizona has established few, if any, policies governing the use of rainwater or sheet flow. It is clear that rainwater or sheet flow can be used to recharge aquifers without requiring an aquifer protection permit, underground water storage permit or recharge permit from the State.

According to Water 2025: Preventing Crises and Conflict in the West, there is a high likelihood of water supply crises and conflicts in the Prescott area by 2025. The major shortfall in the water supply is the available quantity is insufficient to meet the current and future demand. Without major planning, and execution across the watershed there will be a continued depletion of groundwater resources. All estimates show the population of central Yavapai County will continue to increase through 2025 and beyond. By 2050, the population of the area is projected to more than double from its 2006 level of 121,629 to 352,940 (Central Yavapai Highlands Water Resources Management Study – Phase I DRAFT).

Coalition members are requesting funding to expand the existing watershed group established by intergovernmental agreement (IGA) in 2006. *(Please refer to a copy of the IGA included in the Appendix of this document.)*

(5A) Technical Proposal: Evaluation Criteria

5.A.1. Evaluation Criteria A: Watershed Group Diversity and Geographic Scope

Subcriterion No. A1-Watershed Group Diversity: Planned expansion of the UVRWPC will include broad-based representation across the watershed from as diverse a group of stakeholders as is possible. Current formal members include Yavapai County, City of Prescott, Towns of Prescott Valley and Chino Valley, and the Yavapai-Prescott Indian Tribe. Initial meetings for group expansion held in May and June of 2012 have resulted in participation from a large rancher, the Prescott National Forest, the National Resource Conservation Service, the Arizona Game and Fish Department, Arizona Department of Water Resources, and the Chino Valley

Ranger District. Potential members include, but are not limited to, a citizen at large, private landowner, mine claim holder, representation from local chambers of commerce, Prescott Valley Economic Development Foundation, Salt River Project, Yavapai Water Alliance, Prescott Area Realtors, Prescott Area Wildland Urban Interface Commission, small volunteer fire department operating in the interface, rancher, agricultural producer, private water company and/or water district, Arizona Department of Water Resources, state lawmaker, and Arizona Game and Fish Department.

Letters of support and the resolution authorizing expansion of the existing watershed group are attached in the Appendix of this proposal.

Subcriterion No. A2-Geographic Scope: The proposed project area corresponds to three Hydrologic Unit Codes – Upper Verde River Watershed 1506-0202, Big Chino 1506-0201, and the Upper Agua Fria 1507-0102. It includes the Little Chino portion of the Upper Verde Watershed, all of the Big Chino, and a portion the portion of the Upper Agua Fria that falls within the Coalition’s geographic boundaries. A *project area map* is included on page 10.

Subcriterion No. A3-Increasing/Establishing Diversity or Geographic Scope: Coalition partners are embarking on a comprehensive outreach effort to recruit new members representing a diverse group of public and private interests across the watershed. The discussion and explanation of activities to be undertaken are included under *Technical Proposal: Approach* on pages 9 and 10 of this application. A comprehensive list of stakeholders and potential members of the expanded watershed group is included under *Subcriterion No. A1-Watershed Group Diversity* on pages 12 and 13 above.

5.A.2. Evaluation Criteria B: Addressing Critical Watershed Needs

Subcriterion No. B1-Critical Watershed Needs or Issues: Critical needs within the watershed include addressing the groundwater shortage. The umbrella goal for activities, in relation to water supply, is attainment of Safe Yield by 2025. In 1999, the Arizona Department of Water Resources declared the PrAMA to be out of Safe Yield, or in overdraft. Safe Yield is defined as a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area (*A.R.S. §45-561 Section 12*). Additional information on *water supply and uses* is included in Technical Proposal on pages 10-12 of this proposal.

Additional issues include forest health, increase in wildfires, and proliferation of invasive species. The Watershed Restoration Initiative, passed by the Coalition Executive Board in March 2012, broadly identifies critical issues and provides authority for expansion of the watershed group. Since establishment of the Coalition, it has collaboratively worked to “protect the Verde River by recommending Best Management Practices (BMPs) that protect the base flow of the Upper Verde River and contribute to safe yield in the Prescott Active Management Area.” Through passage of the Watershed Restoration Initiative the Coalition formalized its intent to significantly expand the group’s membership “by reaching out to other land and water resource stakeholders and large-scale private landowners to collaboratively increase water supplies

through a concerted watershed restoration aquifer recharge effort within the watershed boundaries.” (Please refer to a copy of the Initiative is attached in the Appendix of this proposal.)

Subcriterion No. B2-Contributions that Address Watershed Needs of Issues: Through a collaborative effort across the watershed that is inclusive of a diverse group of stakeholders, the goal is to develop a watershed restoration and implementation plan that will allow partners to address critical water shortages, promote water conservation, provide public education and inform decision makers. Implementation is also planned to dovetail with the Desert LCC in addressing forest health, increased wildfires, and proliferation of invasive species. More information on the nexus with the Desert LCC is included below under 5.A.4 Evaluation Criteria D: Watershed Group/Landscape Conservation Cooperative Nexus.

5.A.3. Evaluation Criteria C: Implementation and Results

Subcriterion No. C1-Project Planning: The proposed project has a nexus with State of Arizona and countywide planning documents. It addresses issues included in Arizona Department of Water Resource’s PrAMA 3rd Management Plan, a legislatively mandated planning document (A.R.S. §45-566); its subsequent document that the 2010 Draft Demand & Supply Assessment, the precursor to the 4th Management Plan with a draft scheduled for release in September 2012. Also of significant importance is the proposed project’s alignment with the Central Yavapai Highlands Water Resources Management Study (CYHWRMS) Draft Water Supply Alternatives Report and Draft Environmental Considerations related to Water Supply Alternatives. (Please refer to the pertinent pages from CYHWRMS’ drafts included in the Appendix of this proposal.)

Subcriterion No. C2-Readiness to Proceed: Planning for expansion of the Upper Verde River Watershed Protection Coalition began in January 2012 with discussions at meetings of the Coalition Technical Advisory Committee. An Initiative to support expansion was drafted and submitted to the Executive Board in March 2012 for consideration and possible action. The Initiative was unanimously approved by Executive Board members. Since that time two initial meetings have been held, and writing of an outreach plan has commenced. A third meeting is scheduled for July 11, 2012.

The implementation plan for the proposed project was explained in detail under *Technical Proposal: Approach* on paged 9 and 10 of this application. Upon finalization of a grant agreement with Reclamation, the Coalition is ready to immediately proceed with project implementation.

Potential problems associated with project implementation include continued meaningful participation by all stakeholders. This will be a large group and it can be challenging to schedule meetings where everyone is available and keep all members engaged. The watershed coordinator and project manager will be tasked with meeting this challenge. Another issue that cannot be ignored is the potential for disagreement and conflict among stakeholders in an area that is well-known for controversy surrounding water resources. Private landowners and mining claim holders may have a long held distrust of governments and organized groups and could be more difficult to engage.

5.A.4. Evaluation Criteria D: Watershed Group/Landscape Conservation Cooperatives (LCC) Nexus

Subcriterion No. D1-Active Participation in an LCC: The Coalition is not formally participating in the Desert LCC. Preliminary discussions have been held with the Yavapai County Water Advisory Committee (WAC). There is potential that the WAC will serve as the local LCC. All current Coalition members are also members of the WAC, but the WAC covers a larger geographic area than that proposed by the expanded partnership so all WAC members are not potential stakeholders for the expanded watershed group. Geographic boundaries for the proposed project are within the boundaries of the Desert LCC.

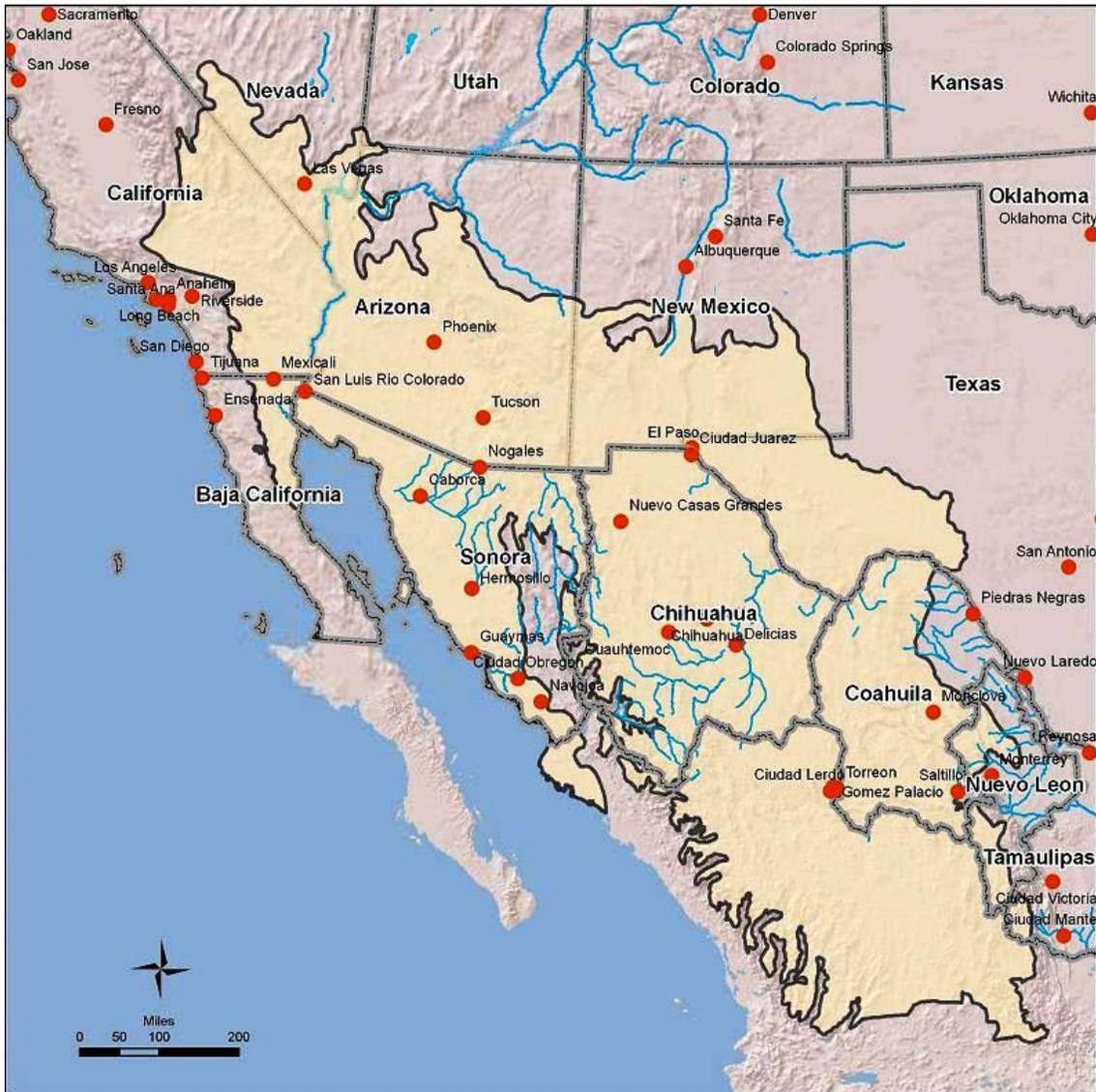


Illustration 2: Map showing the geographic boundaries of the Desert LCC from the Bureau of Reclamation WaterSMART Applied Science Grants for the Desert Landscape Conservation Cooperative, Funding Opportunity Announcement No. R12SF80301

Subcriterion No. D2-Direct Relationship to LCC Activities: The Coalition has submitted a grant application to the Bureau requesting funding for a project that is aligned with LCC goals and objectives. It has a project area broader than that proposed with the Watershed Management application and addresses issues related to land use management, ecological resiliency of forest lands, increased occurrence of wildfires and the proliferation of invasive species and how these issues are related to climate change and availability of groundwater.

Subcriterion No. D3-Goals of Watershed Group Complementary to LCC Goals or Activities: Coalition members are not participating in an LCC because the local LCC has not yet become active. The proposed project supports planning and project implementation across the watershed through a comprehensive watershed restoration effort with a project area that is included in the geographic boundaries of the Desert LCC and is designed to increase water availability to address groundwater overdraft of shortfalls within the designated planning area.

ENVIRONMENTAL AND REGULATORY COMPLIANCE

There are no environmental or regulatory costs associated with the proposed project which will only include planning during the project period.

(1) Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts. **No earth disturbing work is planned with this project.**

(2) Are you aware of any endangered or threatened species in the project area? If so, would they be affected by any activities associated with the proposed project? **We are not aware of any endangered or threatened species in the project area.**

(3) Are there wetlands inside the project boundaries? If so, please estimate how many acres of wetlands there are and describe any impact the project will have on the wetlands. There are approximately 50 acres of wetlands in the project area. **There is no anticipated impact to wetlands with the proposed project.**

(4) Are there any known archeological sites in the proposed project area? **There are no known archaeological sites in the proposed project area.**

(5) Will the project result in any modification of or effects to, individual features of a water delivery system (e.g., headgates, canals)? **The project will not result in any modification of or effects to individual features of a water delivery system.**

(6) If you answered yes to the previous question: **N/A**

(a) State when those features were constructed and describe the nature and timing of any alterations or modifications to those features.

(b) Are any buildings, structures, or features in the area of the proposed listed or eligible for listing on the National Register of Historic Places? The local State Historic Preservation Office can assist in answering this question.

(c) Are there any known archeological sites in the area of the proposed project? Would they be affected by any activities associated with the project? The State Historic Preservation Office can assist in answering this question.

REQUIRED PERMITS OR APPROVALS

No permits or approvals are required in implementation of the proposed project.

OFFICIAL RESOLUTION

An official resolution passed by the Coalition Executive Board authorizing the grant application will be forwarded to Reclamation immediately following the regularly scheduled July board meeting and within the required 30 days after the grant application submission deadline of July 9, 2012.

LETTERS OF SUPPORT

Letters of support along with the official resolution authorizing expansion of the watershed group are attached in the Appendix of this proposal.

FUNDING PLAN

Not Applicable. The grant does not have a required non-federal match requirement during the first year of the project period, the funding period for this grant application. A 50/50 match is required during the second year, if funded, and that is represented in the proposed second year budget included in this application. Match funding in the second year will come from the applicant.

BUDGET PROPOSAL	YEAR ONE				
BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	RECLAMATION FUNDING	TOTAL COST
	\$/Unit and Unit	Quantity			
SALARIES AND WAGES					
GIS Support from Coalition partners	\$40/hr	50 hours		\$ 2,000.00	\$ 2,000.00
Town of Prescott Valley, grant management	\$15/hr	5hrs/month x 12 mnths		\$ 900.00	\$ 900.00
TOTAL Salaries/Wages				\$ 2,900.00	\$ 2,900.00
FRINGE BENEFITS					
GIS Support from Coalition Partners	\$ 2,000.00	.27		\$ 540.00	\$ 540.00
Town of Prescott Valley; administrative support	\$ 900.00	.27		\$ 243.00	\$ 243.00
TOTAL Fringe Benefits				0	\$ 783.00
TRAVEL	0	0	0	0	0
EQUIPMENT	0	0	0	0	0
SUPPLIES/MATERIALS					
Office supplies/meeting materials	\$200/month	12 months		\$ 2,400.00	\$ 2,400.00
TOTAL Supplies/Materials				\$ 2,400.00	\$ 2,400.00
CONTRACTUAL					
Project Manager	\$185/hour	8hrs/month x 12 mnths	0	\$17,760.00	\$17,760.00
Meeting Facilitator	\$100/hour	8hrs/month x 3 mnths		\$ 2,400.00	\$ 2,400.00
Meeting Facilitator	\$1,500.00	3-1/2 day meetings		\$ 4,500.00	\$ 4,500.00
Watershed Coordinator	\$140/hour	16hrs/month x 6 mnths		\$13,440.00	\$13,440.00
Outreach – development of materials/media relations	\$75/hour	60 hours		\$ 4,500.00	\$ 4,500.00
TOTAL Contractual				\$42,600.00	\$42,600.00
MISCELLANEOUS					
Printing of outreach materials	.07/piece	3,000 pieces		\$ 210.00	\$ 210.00
TOTAL Miscellaneous					\$ 210.00
TOTAL PROJECT COSTS				\$48,893.00	\$48,893.00

Percentage of Total Costs				100%	100%
BUDGET PROPOSAL	YEAR TWO				
SALARIES AND WAGES					
John Munderloh, Town of Prescott Valley, Water Resources Manager	\$40/hr	16hrs/month x 12 mnths	\$ 7,680.00		\$ 7,680.00
John Rasmussen, Yavapai County, Water Resources Coordinator	\$36/hr	10hrs/month x 12 mnths	\$ 4,320.00		\$ 4,320.00
Leslie Graser, City of Prescott, Water Resources Specialist	\$36/hr	10hrs/month x 12 mnths	\$ 4,320.00		\$ 4,320.00
Town of Prescott Valley, grant management	\$15/hr	5hrs/month x 12 mnths	\$ 900.00		\$ 900.00
TOTAL Salaries/Wages			\$17,220.00		\$17,220.00
FRINGE BENEFITS					
John Munderloh, Town of Prescott Valley, Water Resources Manager	\$7,680.00	.27	\$ 2,074.00		\$ 2,074.00
John Rasmussen, Yavapai County, Water Resources Coordinator	\$ 4,320.00	.27	\$ 1,166.00		\$ 1,166.00
Leslie Graser, City of Prescott, Water Resources Specialist	\$ 4,320.00	.27	\$ 1,166.00		\$ 1,166.00
Town of Prescott Valley, grant management	\$900.00	.27	\$ 243.00		\$ 243.00
TOTAL Fringe Benefits			\$ 4,649.00		\$ 4,649.00
TRAVEL	0	0	0	0	0
EQUIPMENT	0	0	0	0	0
SUPPLIES/MATERIALS					
Office supplies/meeting materials	\$200/month	12 months	\$ 2,400.00		\$ 2,400.00
TOTAL Supplies/Materials			\$ 2,400.00		\$ 2,400.00
CONTRACTUAL					
Project Manager	\$185/hour	6hrs/month X 12 mnths	\$ 6,660.00	\$ 6,660.00	\$13,320.00
Watershed Coordinator	\$140/hour	16hrs/month X 12mnths		\$26,880.00	\$26,880.00
Outreach/Public Relations	\$75/hour	5hrs/month X 12 mnths	\$ 4,500.00		\$ 4,500.00
Technical Editor	\$75/hour	10hrs/month X 9 mnths	\$ 3,375.00	\$ 3,375.00	\$ 6,750.00
TOTAL Contractual			\$14,535.00	\$36,915.00	\$51,450.00

MISCELLANEOUS					
Prescott Valley conference room For meetings	\$100/mo	12 months	\$ 1,200.00		\$ 1,200.00
TOTAL Miscellaneous					\$ 1,200.00
TOTAL PROJECT COSTS			\$40,004.00	\$36,915.00	\$76,919.00
Percentage of Total Costs			52%	48%	100%

BUDGET NARRATIVE

Year One

Salary and Wages –

GIS Support – Hours in the first three months of the project period to map current watershed conditions – will be provided by GIS partner staff

Grant Reporting – Hours over the 12-month project period for Town of Prescott Valley administrative staff to manage grant funding

Fringe Benefits – Represent the total cost of personnel time dedicated to the project over 12 months time a rate of .27. Includes standard benefits (i.e. Insurance, F.I.C.A., Workmen’s Compensation and Unemployment Insurance)

Supplies/Materials – General office supplies and meeting materials at \$200/month per over the 12 month project period.

Contractual –

Project Manager – A project manager will work eight hours a month during the 12 month project period; responsible for overall project monitoring, adherence to project timeline; grant reporting.

Meeting Facilitator – A meeting facilitator will be hired in two and a half months into the project period. Costs requested represent 8 hours of prep time per scheduled meeting and facilitation for three ½ day workshops to develop mission statement.

Watershed Coordinator – A watershed coordinator will begin work during month 6 of the proposed project period and contribute 16 hours a month for the remainder of the year long proposed project.

Outreach Specialist – An outreach specialist will begin upon project start and work an average of 5 hours/month over the year

Miscellaneous – Partners will print an estimated 3,000 pieces of marketing/outreach material at an estimated .07/piece over the year long project period.

BUDGET NARRATIVE

Year Two

Salary and Wages –

John Munderloh, Town of Prescott Valley Water Resources Manager, will contribute 16 hours per month or 192 hours over the 2nd year of the project – offered as part of the 50% required applicant match

John Rasmussen, Yavapai County Water Resources Coordinator, will contribute 10 hours per month or 120 hours over the 2nd year of the project period – offered as part of the 50% required applicant match

Leslie Graser, City of Prescott Water Resources Specialist, will contribute 10 hours per month or 120 hours over the 2nd year of the project period – offered as part of the 50% required applicant match

Fringe Benefits – Represent the total cost of personnel time dedicated to the project over 12 months time a rate of .27. Includes standard benefits (i.e. Insurance, F.I.C.A., Workmen’s Compensation and Unemployment Insurance) - offered as part of the 50% required applicant match

Supplies/Materials – General office supplies and meeting materials at \$200/month per over the 12 month project period - offered as part of the 50% required applicant match

Contractual –

Project Manager – will work six hours per month for 12 months during the 2nd year of the project period – ½ of the funding for the project manager is requested from Reclamation; remaining ½ offered as part of the 50% required applicant match

Watershed Coordinator – will work 16 hours per month for 12 months during the 2nd year of the project period – total funding is requested from Reclamation

Outreach Specialist – An outreach specialist will begin upon project start and work an average of 5 hours/month over the year - offered as part of the 50% required applicant match

Technical Editor – hired 3 months into the 2nd year of the project period to edit water restoration plan – will work an average of 10 hours a month - ½ of the funding for the project manager is requested from Reclamation; remaining ½ offered as part of the 50% required applicant match

Miscellaneous – Cost for use of Town of Prescott Valley conference room for monthly group meetings throughout the 2nd project year - offered as part of the 50% required applicant match

UPPER VERDE RIVER WATERSHED PROTECTION COALITION

Watershed Restoration and Recharge Policy Initiative

RECITALS

The Upper Verde River Watershed Protection Coalition (Coalition) was formed by the Town of Chino Valley, Town of Prescott Valley, City of Prescott, Yavapai-Prescott Indian Tribe, and Yavapai County in acknowledgement of the importance of the Verde River and their joint stewardship of the Upper Verde River Watershed Area (Watershed Area).

The Coalition has since engaged in collaborative efforts to help protect the Verde River by recommending Best Management Practices (BMPs) that protect the base flow of the Upper Verde River and contribute to safe yield in the Prescott Active Management Area. These BMPs include an aquifer recharge pilot project.

The Coalition desires now to expand these efforts by reaching out to other land and water resource stakeholders and large-scale private landowners to collaboratively increase water supplies through a concerted watershed restoration and aquifer recharge effort within the Watershed Area.

INITIATIVE

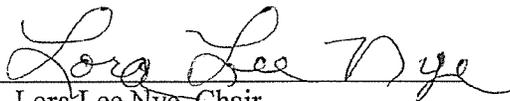
The Executive Board of the Coalition hereby recommends that the Coalition now apply its resources to significantly expand its efforts to encourage watershed restoration efforts that lead to increased aquifer recharge in the Watershed Area. This will involve reaching out to and coordinating with other partners to research and implement a broad-ranging program of Watershed Area restoration and forest and rangeland management. These efforts would include identification of and application for funding, project development and administration, legislation, and public relations. Potential partners include the U.S. Forest Service, the Arizona Department of Water Resources, Northern Arizona University, the Natural Resource Conservation Service, the Arizona State Land Department, large-scale private landowners and others.

The preliminary goal is to increase groundwater recharge from 2% of total precipitation to 3% of total precipitation. It is believed that this would generate up to 20,000 acre-feet per year of additional water supplies across the Big Chino subbasin and Prescott Active Management Area (PrAMA), and will greatly ameliorate the current overdraft of 10,000 acre feet in the PrAMA. This goal is subject to modification and refinement as research and program administration mature.

Specific initial actions by the Coalition include: (a) adoption of resolutions by individual Coalition member boards and councils, and (b) Coalition staff and Technical

Advisory Committee contacts and cooperation with potential partners to design and implement agreements, scientific research, capital projects, and legislative efforts, and identify funding sources and apply for funding.

RECOMMENDED this 28th day of March 2012, by the Executive Committee of the Upper Verde River Watershed Protection Coalition, in accordance with §§4 & 16 of its June 8, 2006 Intergovernmental Agreement.


Lora Lee Nye, Chair

Recorded at the Request of:

Board of Supervisors
Folder

When Recorded, Mail to:

Ana Layman-Trujillo, Recorder
OFFICIAL RECORDS OF YAVAPAI COUNTY
YAVAPAI CO BD SUPERVISORS INAG

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INTERGOVERNMENTAL AGREEMENT FOR UPPER VERDE
 RIVER WATERSHED PROTECTION COALITION BETWEEN
 YAVAPAI COUNTY, TOWN OF CHINO VALLEY, TOWN OF PRESCOTT VALLEY,
 CITY OF PRESCOTT, YAVAPAI-PRESCOTT INDIAN TRIBE AND TOWN OF DEWEY-HUMBOLDT

UNOFFICIAL
 COPY



**INTERGOVERNMENTAL AGREEMENT
UPPER VERDE RIVER WATERSHED
PROTECTION COALITION**

THIS AGREEMENT is entered into this 8 day of June, 2006 ("the Effective Date") by and between the **TOWN OF CHINO VALLEY, TOWN OF DEWEY-HUMBOLDT, TOWN OF PRESCOTT VALLEY, CITY OF PRESCOTT, YAVAPAI-PRESCOTT INDIAN TRIBE, YAVAPAI COUNTY,** and the **SALT RIVER PROJECT CORPORATION** (hereinafter the "PARTIES").

RECITALS

WHEREAS, the PARTIES recognize that adequate water resources are critical to the quality of life and economic well being of the residents in the incorporated and unincorporated areas of the Upper Verde River Watershed Area (as defined in Exhibit A);

WHEREAS, the PARTIES acknowledge the importance of the Verde River and their stewardship of the Upper Verde River Watershed Area; and

WHEREAS, the PARTIES mutually acknowledge the importance of collaborative efforts to address water resource issues on a regional basis by creating management goals that help protect the Verde River, and therefore wish to form the Upper Verde River Watershed Protection Coalition (hereinafter the "COALITION") to further such efforts; and

WHEREAS, appropriations will be authorized by individual PARTIES once the COALITION (as defined in Section 1 below) is established, and funds contributed by the PARTIES will allow the COALITION to study, evaluate and submit consensus recommendations concerning implementation of Best Management Practices (BMPs) intended to protect the base flow of the Upper Verde River;

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. **FORMATION OF COALITION.** In order to create a forum for cooperative action intended to protect the water resources of the Upper Verde River, the PARTIES hereby create the COALITION consisting of appointed representatives of each PARTY. The PARTIES may at any time during the effective term of this Agreement join the COALITION by signing this Agreement. Representatives shall be appointed by the respective governments and agencies in accordance with their respective appointment procedures.
2. **PURPOSE.** Working together to protect the Upper Verde River, the COALITION is committed to balancing the reasonable water needs of the residents of the Upper Verde River Watershed Area with protection of the base flow of the Upper Verde River to the maximum possible extent by developing BMPs that



incorporate science-based planning, utilization and conservation of all water resources within the Upper Verde River Watershed Area (Exhibit A), and provide financial and staff resources as determined by each of the respective COALITION members to be required to support the protection activities of the COALITION.

3. **GOALS.** Acknowledging that water users throughout the Upper Verde River Watershed Area have impacts upon surface and groundwater systems of this area, the COALITION recognizes that water users should be responsible for their impacts. Therefore, the COALITION supports the creation of BMPs that balance the reasonable water needs of the residents of the Upper Verde Watershed Area with the need to preserve the vitality, health and future flows of the Upper Verde River, good stewardship of the water resources, and equal access to unbiased scientific information upon which BMPs are to be based.
4. **ORGANIZATION.** The COALITION is comprised of (a) an Executive Board which consists of one representative of each of the PARTIES, and (b) a Technical Advisory Committee with members appointed by the Executive Board. Membership of the Executive Board is expressly limited to the PARTIES. If necessary, work groups to support efforts of the Technical Advisory Committee may be established. The COALITION is not a separate legal entity, but rather is a forum for the PARTIES to act jointly and cooperatively as appropriate to further the goals of this Agreement.
5. **FUNDING.** The PARTIES agree to (a) contribute funds annually in amounts to be determined by each PARTY, subject to appropriation of such funds by the governing body of each PARTY, and (b) provide in-kind services to the COALITION which will be furnished without charge to COALITION members to accomplish various tasks, including (but not limited to) coordinating meetings, completing grants and requests for proposals, and coordinating scientific and professional services.
6. **COALITION COORDINATION.** The COALITION shall be facilitated through in-kind services from the PARTIES until such time as hiring a full-time coordinator and full-time staff may be deemed necessary by the Executive Board. Any coordinator shall act under the direct supervision of the Executive Board and any staff shall act under the supervision of any coordinator. The duties and responsibilities of any staff or coordinator shall be determined by the Executive Board, along with any necessary Personnel Rules and Regulations. Nothing herein shall preclude the Executive Board from electing to contract with individual PARTIES for any staff and coordinator.
7. **DURATION AND TERMINATION.** The initial term of this Agreement shall run from its effective date until June 30, 2011. It shall thereafter be deemed renewed for successive one-year terms unless any PARTY notifies the other PARTIES no less than 60 days prior to the date of expiration of the then-current term or renewal term of its intent to terminate. Further, the Agreement may be terminated, with or without cause by any PARTY upon providing 180 days' notice to the other PARTIES. In the event any PARTY provides notification of its intent to terminate, the remaining PARTIES may continue under the terms of this Agreement. In the event any PARTY chooses not to renew, the remaining



PARTIES may agree to renew the Agreement under such terms and conditions as they determine to be in their mutual interest. As of the effective date of the renewal Agreement among the remaining PARTIES, the terminating PARTY shall no longer be bound by the terms and conditions of this Agreement.

8. **DISPOSITION OF ASSETS UPON TERMINATION.** Upon termination of this Agreement, an amount equal to the depreciated value of any assets acquired pursuant to this Agreement shall be distributed among the PARTIES in proportion to their total contributions during the effective term of this Agreement.
9. **CANCELLATION FOR CONFLICT OF INTEREST.** This Agreement is subject to cancellation pursuant to A.R.S. §38-511 (the pertinent provisions of which are incorporated herein by reference).
10. **REQUIRED FILING.** Pursuant to A.R.S. §11-952, a copy of this Agreement shall be filed in the Office of the Yavapai County Recorder.
11. **GOVERNING LAW.** This Agreement shall be interpreted in accordance with the substantive and procedural laws of the State of Arizona and shall be deemed made and entered into in Yavapai County.
12. **AMENDMENT.** This Agreement contains the entire agreement except as expressly provided herein. The terms of this Agreement may only be amended, modified or waived by a written instrument approved by the respective governments and agencies.
13. **INDEMNIFICATION.** Each PARTY (as "indemnitor") agrees to save, hold harmless and indemnify the other PARTIES (as "indemnitees") for any claims, losses, liability, costs or expenses arising out of omissions, negligence, misconduct or other fault of the indemnitor, its officers, officials, agents, employees or volunteers pursuant to this Agreement.
14. **WAIVER OF ATTORNEYS FEES.** The PARTIES expressly covenant and agree that in the event of litigation arising from this Agreement, no PARTY shall be entitled to an award of attorneys fees, either pursuant to the Agreement, pursuant to A.R.S. §12-341.01(A) and (B), or pursuant to any other state or federal statute.
15. **DISPUTE RESOLUTION.** The PARTIES intend that disputes regarding the interpretation and application of this Agreement shall, to the greatest possible extent, be resolved internally. The Executive Board may establish uniform procedures for such internal dispute resolution. In the event of disagreements regarding interpretation and application of this Agreement that cannot be resolved internally, the PARTIES agree to submit only such matters to an arbitrator selected by Agreement of the affected PARTIES. If the PARTIES are unable to agree on an arbitrator, each shall select an arbitrator who shall, in turn, select a third arbitrator. The arbitration proceeding shall be conducted in accordance of the then-current rules of the Yavapai County Superior Court. The decision of the arbitrator shall be final, non-appealable and binding on all PARTIES. Aside from expenses of counsel, all parties shall share equally in the



expenses of arbitration. In the event of litigation, the PARTIES agree to waive trial by jury, agree that all such matters shall be submitted for trial by the Court.

16. **CONDUCT OF MEETINGS.** Meetings of the COALITION will be conducted in accordance with the Arizona Open Meeting Laws. Each respective COALITION member shall post meeting notices and agendas in accordance with their respective notice and posting practices. Any conclusions or recommendations of the Executive Committee shall be by consensus, rather than voting. All records of the COALITION shall be public unless such records are otherwise deemed confidential pursuant to applicable statutes.
17. **NOTICES.** Any notices provided pursuant to this Agreement shall be deemed to have been duly delivered upon personal delivery or as of the second business day after mailing in the United States mail, postage prepaid to such addresses as may be specified in writing by a PARTY.
18. **BREACH.** Failure or unreasonable delay by any PARTY to perform or act in accordance with any term or condition of this Agreement shall constitute a breach of the Agreement. A PARTY claiming a breach by another PARTY shall provide written notice thereof, said notice setting forth the factual basis for the determination that a breach has occurred. If the breach is not remedied within thirty (30) days of the breaching PARTY's receipt of notice or within such additional time as may be reasonably required to remedy the breach, the non-breaching PARTY may exercise all rights and remedies as provided in this Agreement or otherwise by law. No waiver by a PARTY of a breach of any of the terms, covenants or conditions of this Agreement shall be construed or held to be a waiver of any succeeding or preceding breach of the same or any other term, covenant or condition herein contained.
19. **RECORDS.** The COALITION shall keep and maintain all records reasonably required for audit arising from or relating to its activities under this Agreement. The COALITION shall reasonably accommodate any request by representatives of any PARTY to have access to all such records for review, monitoring, and audit, during normal working hours.
20. **FURTHER PERFORMANCES.** Each of the PARTIES hereto shall execute and deliver all such documents and perform all such acts as are reasonably necessary, from time to time, to carry out the matters contemplated by this Agreement.
21. **NO PARTNERSHIP OR THIRD-PARTY BENEFICIARY.** It is not intended by this Agreement to, and nothing contained in this Agreement shall, create any partnership, joint venture or other arrangement between or among the PARTIES. No term or provision of this Agreement is intended to, or shall, be for the benefit of any person, firm, organization or corporation not a party hereto, and no such other person, firm, organization or corporation shall have any right or cause of action hereunder.
22. **MULTIPLE COUNTERPARTS.** This Agreement may be executed in multiple counterparts, each of which shall constitute one and the same instrument.



APPROVALS

IN WITNESS WHEREOF, the PARTIES hereto have caused this Agreement to be executed by their duly-authorized officials and to be effective on the date first-above written.

SEAL

TOWN OF CHINO VALLEY

Karen Fann 6/27/2006
Karen Fann, Mayor Date

ATTEST:

Jami Lewis 6-27-06
Jami Lewis Date
Town Clerk

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the Town of Chino Valley, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Town of Chino Valley.

A. M. [Signature] 7/5/06
Town Attorney Date

TOWN OF DEWEY-HUMBOLDT

Tom Hintze 6.20.06
Tomas Hintze, Mayor Date

ATTEST:

Debbie Gifford 6.20.06
Debbie Gifford Date
Town Clerk

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the Town of Dewey-Humboldt, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Town of Dewey-Humboldt.



[Signature] 6-20-06
Town Attorney Date

SEAL

TOWN OF PRESCOTT VALLEY

[Signature] 6-8-06
Harvey Skogg, Mayor Date

ATTEST:

[Signature] 6-8-06
Diane Russell Date
Town Clerk

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the Town of Prescott Valley, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Town of Prescott Valley.

[Signature] 6/9/06
Town Attorney Date

CITY OF PRESCOTT

SEAL

[Signature] 6/13/06
Rowle Simmons, Mayor Date

ATTEST:

[Signature] 6/13/06
Elizabeth A. Burke Date
City Clerk

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the City of Prescott, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the City of Prescott.



[Signature] 6/14/06
City Attorney Date

YAVAPAI COUNTY

SEAL

[Signature] 7-10-06
Thomas Thurman, Chairman Date
Yavapai County Board of Supervisors

ATTEST:

[Signature] 7/10/06
Bev Staddon Date
County Clerk
Yavapai County Board of Supervisors

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the Yavapai County, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Yavapai County.

[Signature] 7/12/06
County Attorney Date

YAVAPAI - PRESCOTT TRIBE

Authorized Representative Date

ATTEST:

Witnessed Date

Determination of Counsel

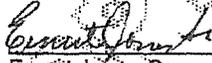
Pursuant to A.R.S. § Section 11-952(D), the foregoing agreement has been reviewed by the undersigned attorney for the Yavapai - Prescott Tribe, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Yavapai - Prescott Tribe.

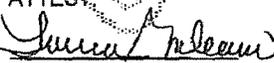


YAVAPAI-PRESCOTT INDIAN TRIBE

The foregoing Intergovernmental Agreement regarding the Upper Verde River Watershed Protection Coalition is entered into by the Yavapai-Prescott Indian Tribe ("YPIT") under the following three terms and conditions:

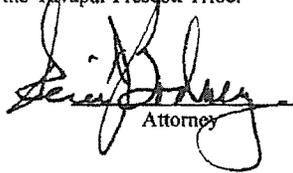
1. Nothing in the Agreement shall be construed to impair the rights granted, reserved, or protected by federal law or interfere with YPIT's right to tribal self government;
2. Nothing contained in the Agreement waives the right of the YPIT to object to the jurisdiction of the courts of the State of Arizona to adjudicate any disputes arising under the Agreement.
3. Nothing contained in the Agreement shall be construed to waive or amend agreements entered into between the YPIT and the other PARTIES to the Agreement, including, but not limited to, the Yavapai-Prescott Indian Tribe Water Rights Settlement Act of 1994, Public Law 103434, 108 Stat. 4526 (1994) (the "Act"), and the Water Service Agreement, as ratified by the U.S. Congress in the Act.


 Ernest Jones, Sr., 1-23-07
 President, Board of Directors Date

ATTEST

 Lorna Galeano, 1-23-07
 Secretary-Treasurer Date

Determination of Counsel

Pursuant to A.R.S. § Section 11-952(D), the forgoing agreement has been reviewed by the undersigned attorney for the Yavapai-Prescott Indian Tribe, who has determined that the agreement is in proper form and is within the powers and authority granted under the laws of this State to the Yavapai-Prescott Tribe.


 Attorney 12/15/06
 Date

The Town of Chino Valley
Engineering Department
1020 West Palomino Road
P.O. Box 406
Chino Valley, Az 86323



Town Hall Telephone (928) 636-2646
Town Hall Fax (928) 636-2144
Engineering Telephone (928) 636-7140
Engineering Fax (928) 636-7141

July 2, 2012

U.S. Department of Interior
Bureau of Reclamation
Attention: Michelle Maher
Denver Federal Center, Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

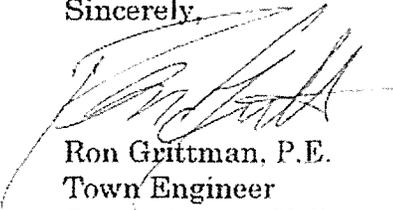
Dear Ms. Maher:

The Town of Chino Valley is wholly supportive of the Upper Verde River Watershed Protection Coalition (UVRWPC) bid to seek funding through the United States Department of Interior, Bureau of Reclamation under the WaterSMART: Watershed Management grant program.

It is essential to the sustainability of our water supply that a diverse group of stakeholders work collaboratively across the watershed to address critical issues. The Coalition is an established watershed with a priority, established by resolution of the Executive Board in March, 2012, to engage additional stakeholder for development and implementation of a watershed restoration plan.

I want to thank you for this opportunity. We are a group of engineers, scientists, and community members coming together in service of a common goal. If you have any questions, please contact me at 928-636-7140 or e-mail rgrittman@chinoaz.net.

Sincerely,



Ron Grittman, P.E.
Town Engineer
Town of Chino Valley



U.S. Department of Interior
Bureau of Reclamation
Attention: Michelle Maher
Denver Federal Center, Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

June 29, 2012

Dear Ms. Maher:

The City of Prescott is one of five governments that serve as regional partners in the Upper Verde River Watershed Protection Coalition (UVRWPC). It collaborates with the Towns of Prescott Valley and Chino Valley, Yavapai County and the Yavapai-Prescott Indian Tribe to address the common issue of protection and sustainability of our water supply.

As a member of the Coalition, the City supports the current effort to seek funding through the BOR Watershed Management Program in support of its Watershed Restoration Initiative launched in March 2012. Outside funding is critical to our ability to fully implement our projects. A copy of the Coalition Executive Board Resolution approving the Initiative is attached with this grant application along with a signed copy of the intergovernmental agreement that established the Coalition in 2006.

Thank you for this opportunity to apply for funding and we look forward to a partnership with Reclamation in addressing pressing issues facing our region. If you have further questions, please do not hesitate to call me at 928-777-1144 or e-mail leslie.graser@prescott-az.gov.

Sincerely,



Leslie Graser
Water Resources Specialist
City of Prescott

YAVAPAI COUNTY BOARD OF SUPERVISORS

THOMAS THURMAN – Chairman
District 2
web.bos.district2@co.yavapai.az.us

A.G. “CHIP” DAVIS – Vice-Chairman
District 3
web.bos.district3@co.yavapai.az.us

CAROL SPRINGER – Member
District 1
web.bos.district1@co.yavapai.az.us



1015 FAIR STREET
PRESCOTT, ARIZONA 86305
PHONE: (928) 771-3200
FAX: (928) 771-3257
TDD: (928) 771-3530
www.co.yavapai.az.us

JULIE AYERS
**County Administrator/
Clerk of the Board**
julie.ayers@co.yavapai.az.us

DAVID S. HUNT
Board Counsel
dave.hunt@co.yavapai.az.us

U.S. Department of Interior
Bureau of Reclamation
Attention: Michelle Maher
Denver Federal Center, Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

July 3, 2012

Dear Ms. Maher:

The Upper Verde River Watershed Protection Coalition, established in 2006 by intergovernmental agreement, is a consensus-based regional group of governments with the ability to effectively address and forward solutions water resource issues within the Upper Verde River Watershed. It is governed by an Executive Board comprised of elected representatives from each member jurisdiction.

An initiative was passed by the Executive Board March 2012 authorizing expansion of the existing watershed group to include a diverse group of stakeholders, from private landowners and non-profit organizations to state and federal agencies with an interest in and tie to the watershed. A copy of that is attached in the Appendix of this proposal.

Yavapai County is a founding member of the Coalition and fully supportive of the Coalition's efforts to seed funding from Restoration to support its watershed initiative. Thank you so much for this opportunity. If you need further assistance, I can be reached at 928-442-5199 or via e-mail at John.Rasmussen@co.yavapai.az.us.

Sincerely,

John Rasmussen
Water Resources Coordinator
Yavapai County

Central Yavapai Highlands Water Resources Management Study Water Supply Alternatives Report

Executive Summary

The purpose of this report is to describe and analyze, at an appraisal level, water supply alternatives to satisfy unmet water demand (in 2050) in the Central Yavapai Highlands Water Resources Management Study Planning Areas. Alternative water supplies inside the study area include groundwater, waste water, flood water, storm water, effluent and conservation measures. Surface water and ground water sources outside the study area are also evaluated. Each alternative will list the Water Planning Areas (WPAs) considered, alternative description, infrastructure requirements, analysis including quantity and costs, legal/institutional issues and environmental concerns. Table xx lists the water supply type, alternative number and brief description.

Table xx. Water Supply Alternatives

Water Supply	Alternative #	Alternative
Inside the Study Area		
Groundwater	1	Local Groundwater Development (within each WPA)
	2	Regional Groundwater Development (Big Chino Sub-basin)
Waste Water (Septic Only)	3	Conversion of Existing Systems (Urban)
	4	Conversion of Existing Systems (Rural)
Flood Water	5	Capture and Store Verde (or Trib) Unappropriated Flood Water
Storm Water	6	Storm Water -Macro Rainwater Harvesting
Effluent	7	Existing Unused Effluent and/or Capacity
	8	New Effluent from Septic (Taken out)
	9	New Effluent from New Population
Conservation	10	Implement Conservation (i.e. rainwater harvest, turf restrictions, educational programs, etc.)
Outside the Study Area		
Surface Water	11	Alamo Lake
	12	Colorado River (via (a)Alamo Lake, (b)Lake Powell, (c)Diamond Creek, (d)Lake Mead, (e)Lake Havasu, (f)Lake Mohave)
Ground Water	13	(a)Big Sandy, (b)Bill Williams (Santa Maria Creek), (c) Bill Williams (Burro Creek), (d)Agua Fria
Other	14	Weather Modification – Cloud Seeding
	15	Watershed Management

Alternative 15

Watershed Management

Planning Areas Considered

All water planning areas are considered.

Alternative Description

Watershed Management practices to increase water yield by manipulating vegetative coverage has been researched for many decades in Arizona. There have been demonstrations that water yield can be increased in watersheds under certain conditions. However, clearing vegetation for augmenting water supplies may be short lived due to quick re-growth, maintenance costs, water quality degradation, flooding and concerns over environmental impacts.

“An analysis by Hibbert (1979) showed that vegetative manipulations could increase water yields only on watersheds receiving more than 480 mm (19 in.) of annual precipitation. He reasoned that precipitation below this amount is effectively used by any residual overstory vegetation and subsequent increases in herbaceous plant cover on the watersheds. This finding, along with other analyses of water-yield improvement potentials, suggested that in the Southwest, high-elevation mixed conifer and ponderosa pine forests and portions of low-elevation chaparral shrublands have the best theoretical potentials for increasing water yields through vegetation management.” *Watershed Management Perspectives in the Southwest: Past, Present, and Future*, Peter F. Ffolliott, Malchus B. Baker Jr and Vicente L. Lopes. The Central Yavapai Highlands Water Resource Management Study area meets these conditions and may have potential for increased water yield by watershed management.

The research on increasing water yield on small chaparral watersheds showed that watersheds with 23-30 inches of precipitation, increased water yield by 2.9 – 5.9 inches. For watersheds averaging 17 inches of precipitation, water yield increases averaged less than .59 inches.

“To maximize water yield, shrubs should be eradicated as completely as practicable on the area actually treated, and the treated areas should be adjacent to or as close as possible to drainage ways to avoid loss of water savings to down slope vegetation.” *In the Water Yield changes Resulting from Treatment of Arizona Chaparral*, A.R. Hibbert, E. A. Davis, and O.D. Knipe. Furthermore, the water would have to be captured before it reached a natural channel and is considered surface water.

Infrastructure Requirements

There are common methods of removing vegetation:

- Mechanical removal
- Hand removal
- Controlled burning
- Herbicides (hand sprayed or by helicopter)

http://www.marinwater.org/documents/veg_mgmt_and_herbicides_FactSheet_022107.pdf and *In the Water Yield changes Resulting from Treatment of Arizona Chaparral*, A.R. Hibbert, E. A. Davis, and O.D. Knipe.

Alternative Analysis

Cost

Prescribed fire cost estimates per acre (four examples)

500-acre area, brush/grass \$31

2,000-acre area, ponderosa pine \$86

200-acre area, mixed conifer \$174

100-acre area, Douglas-fir \$12

Fuels Planning: Science Synthesis and Integration

Economic Uses Fact Sheet: 8, Prescribed Fire Costs. USDA Forest Service, 2004.

Legal and Institutional

Removing trees for water yield can cause degraded water quality (due to increased water temperatures and sedimentation), increased risk of flooding in downstream areas, and negative ecological impacts, such as loss of habitat and other ecosystem services otherwise provided by forests.

The use of herbicides and degradation of the land may not be acceptable by the public.

Environmental

CENTRAL YAVAPAI HIGHLANDS WATER RESOURCES MANAGEMENT STUDY
 ENVIRONMENTAL CONSIDERATIONS related to WATER SUPPLY ALTERNATIVES

Alternative 13

Watershed Management

This alternative proposes to increase water yield by manipulating vegetative coverage specifically in watersheds with chaparral shrublands, ponderosa and conifer forests. Results for water yield are best in areas that receive more than 19 inches of annual precipitation or more. However, clearing vegetation for augmenting water supplies may be short lived due to quick re-growth, maintenance costs, water quality degradation, flooding and concerns over environmental impacts.

Alternative 13. Watershed Management

Environmental Issues	(+) or (-) Affect, or Minimal (0)	Notes
Hydrologic		
Impact to Water Quality	-	Alternative description states that <i>"Removing trees for water yield can cause degraded water quality..."</i> . Also chaparral studies show that following treatments there was an initial flush of both sediment and nutrients that lasted for a year or two.
Impact to Streamflow	+	It is estimated that runoff may increase from watershed and vegetation treatment. NAU has estimated a range of runoff increases; from 7 to 21% in first treatment areas. This estimate is based on Beaver Creek studies when basal area of ponderosa pine forest was reduced by 30-100%. The range estimated is intended to reflect the low and high end of a range of potentially expected values. As such, the low end is adjusted downward for diminishing effects over time, with no increased water yield after 6 years for a given treatment. The high end reflects the absolute possible high, the first year after treatment. There is anticipated to be diminishing returns over time after initial treatment. As part of the Four Forest Restoration Initiative a paired watershed study is planned to test water yield effects over time from various treatment intensities as well as effects of followup treatments.
Impact to Groundwater Availability	+	Groundwater recharge should increase with better upland watershed vegetation management
Biologic		

Impact to Vegetation	+	Improvements due to increased water availability and more natural hydrologic regime than in over forested watershed
Impact to Wildlife (Riparian-Obligate)	+	
Impact to Fish/Aquatic Species	+	
Watershed		
Impact to Watersheds	+	Overall improved watershed condition from thinning/burning, reduced risk of catastrophic wildfire