

**RESOLUTION OF THE  
WHITE MOUNTAIN APACHE TRIBE OF THE  
FORT APACHE INDIAN RESERVATION**

- WHEREAS,** the Tribe's Miner Flat well field, which supplies municipal and industrial water to nearly 80% of the Reservation's population, (10,000 persons) including the greater Whiteriver area, is now showing signs of extreme dewatering and faces probable extinction within 3 to 5 years or less at current extraction rates; and
- WHEREAS,** the fire and drought impacts to Reservation water resources are so severe that the Tribe stands to lose millions of dollars in sawmill and recreation revenues due to loss of commercial timber and administrative closures mandated by hazardous conditions as well as loss of fish in ash-impacted streams; and
- WHEREAS,** the drought-impacted winter snowpack in the region has seriously impaired the Tribe's valuable ski industry and local businesses dependent on that industry; and
- WHEREAS,** the foregoing economic damage has impacted and will continue to impact the Tribe's capacity to defend its reserved and aboriginal water rights and water development; and
- WHEREAS,** the Tribe has asserted prior and paramount rights to the use of water from not only surface waters, but from the Coconino and other trans-basin aquifers that provide the base flow of the Tribe's springs and streams; and
- WHEREAS,** the Arizona Supreme Court, has held in the Gila River and Little Colorado General Stream Adjudications that federal reserved rights extend to groundwater; and
- WHEREAS,** the Bureau of Indian Affairs, principal agent of the Trustee United States, has filed amended water rights claims on behalf of the Tribe to include priority claims to the trans-basin Coconino and Volcanic Aquifers in the Little Colorado River and Gila River General Stream Adjudications; and
- WHEREAS,** off-Reservation groundwater pumping from the Coconino and related aquifers in the Little Colorado River Basin may become an imminent threat to the base flow of the Tribe's springs and rivers within the Salt River Basin; and
- WHEREAS,** the White Mountain Apache Tribe must construct a Reservation wide rural water system to ensure a dependable, high quality drinking water supply for the White Mountain Apache Tribe if it is to survive as a people on its ancestral and aboriginal land base, the remnant of which is now the Fort Apache Indian Reservation; and

**WHEREAS,** the Tribe has proposed authorizing legislation to fund construction of a municipal water storage facility known as Miner Flat Dam on the north fork of the White River and construction of a water delivery system for the greater Whiteriver area, including the Tribal Communities of Carrizo and Cibecue which will soon lack an adequate water supply; and

**WHEREAS,** the Miner Flat storage facility will have an active storage capacity of 6,000 acre feet and will provide a sustainable and reliable source of drinking water and other benefits to the White Mountain Apache Tribe until the year 2050 when the Tribal population served thereby is projected to be 36,800 persons; and

**WHEREAS,** in order to obtain support for the Tribe's Miner Flat storage facility project, the Tribe must meet with and be prepared to explain to state and other parties in the Gila River and Little Colorado River General Stream Adjudications, and particularly, the Arizona Department of Water Resources and Salt River Project, and other Indian Tribes, regarding the impact that the Tribe's proposed Miner Flat storage facility may have on downstream water users, other Indian Tribes, and the Gila River Indian Community Water Settlement Act now pending in Congress; and

**WHEREAS,** the funding request outlined in the Tribe's water rights litigation and negotiation (344) BIA grant application identifies issues and concerns of the Arizona Department of Water Resources and other parties in the General Stream Adjudications which must be clarified and investigated by the Tribe; and

**WHEREAS,** there is a pressing and urgent need for the Tribe to obtain funding from the BIA to: (1) support development of basic resource studies and technical data to prepare and defend the Tribe's reserved water rights claims; (2) reach ultimate resolution of its long-standing reserved water rights claims with adequate preparation to litigate those claims; (3) conduct technical studies and investigations related to the Tribe's water rights claims in the ongoing General Stream Adjudications in the Apache County and Maricopa County Superior courts; (4) continue to update its groundwater model for the transbasin Coconino and other aquifers; (5) continue and expand water development and other water monitoring studies as described in the Tribe's BIA 2004 funding request, including, but not limited to employment of competent historians and agricultural-livestock economists for the preparation of practicable irrigable acreage and other water use claims; (6) analyze prospects for Tribal intervention and negotiation in pending state court actions; and (7) conduct a depletion analysis, salinity investigation and other technical studies as described in the Tribe's FY 2004 Water Rights Litigation and Negotiation (344) BIA grant application; and

**WHEREAS,** the Tribe's efforts in the foregoing areas are not duplicative of BIA and Department of Justice efforts regarding the Tribe's water rights; and

**WHEREAS,** the Tribe has completed the tasks previously funded by the BIA as itemized in the associated Progress Reports included in the Tribe's current and prior funding requests for Bureau of Indian Affairs Water Development (340) and Litigation and Negotiation (344) grants; and

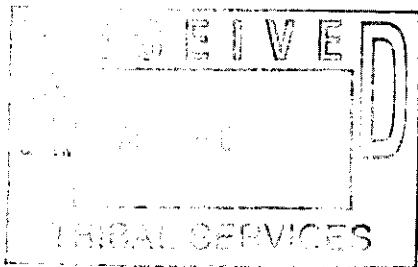
**WHEREAS,** past funding to the Tribe by the Trustee, United States, through its principal agent, the Bureau of Indian Affairs, has been greatly appreciated by the Tribe, but is insufficient to fund necessary water resources planning, management and pre-development, and water rights litigation and negotiation; and

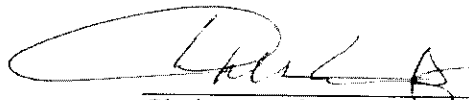
**WHEREAS,** approval by the Trustee United States of the Tribe's FY2004 BIA funding requests, (340) and (344), respectively, as itemized and justified in said grant requests, are critical at this time to protect, advance, and resolve the Tribe's priceless water rights.

**BE IT RESOLVED** by the Tribal Council of the White Mountain Apache Tribe that it hereby approves under authority of Public Law 93-638, FY2004 funding applications to the Bureau of Indian Affairs Branch of Land and Water Resources and to the Office of Trust Responsibilities under the category of "Water Resources Planning, Management and Pre-development (340)" in the amount of \$536,655 and under the category of "Water Rights Litigation and Negotiation (344)" in the amount of \$397,400 as itemized and justified therein.

**BE IT FURTHER RESOLVED** by the Tribal Council of the White Mountain Apache Tribe that the Tribal Chairman, and in his absence, the Vice Chairman, is hereby authorized to sign any and all necessary documents related to the two BIA funding requests for FY2004, reviewed and approved this date by the Tribal Council.

The foregoing resolution was on July 22, 2003 duly adopted by a vote of SIX for and ZERO against by the Tribal Council of the White Mountain Apache Tribe, pursuant to authority vested in it by Article IV, Section 1 (a), (c), (d), (f), (h), (i), (j), (k), (s), (t) and (u) of the Constitution of the Tribe, ratified by the Tribe September 30, 1993, and approved by the Secretary of the Interior on November 12, 1993, pursuant to Section 16 of the Act of June 18, 1934 (48 Stat. 984).

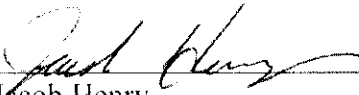


  
\_\_\_\_\_  
Chairman of the Tribal Council

  
\_\_\_\_\_  
Secretary of the Tribal Council

Signatures of the members of the Tribal Council represent their approval of Tribal Resolution  
No. 07-2003-193.

\_\_\_\_\_  
Dallas Massey, Sr.  
Tribal Chairman

  
\_\_\_\_\_  
Jacob Henry  
District I Council Member

  
\_\_\_\_\_  
Phoebe L. Nez  
District II Council Member

  
\_\_\_\_\_  
Patrick Cruz  
District III Council Member

  
\_\_\_\_\_  
Mariddie J. Craig  
District IV Council Member

\_\_\_\_\_  
Noland Clay  
District IV Council Member

Dated this 22nd day of July, 2003.

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Frank Johnny Endfield, Jr.  
Vice-Chairman

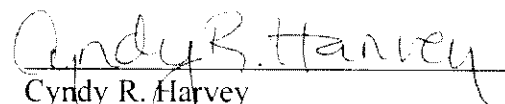
  
\_\_\_\_\_  
Ronnie Lupe  
District I Council Member

\_\_\_\_\_  
Lynn Cody  
District II Council Member

\_\_\_\_\_  
Margaret Baha-Walker  
District III Council Member

  
\_\_\_\_\_  
Wayland Burnette  
District IV Council member

ATTEST:

  
\_\_\_\_\_  
Cyndy R. Harvey  
Tribal Council Secretary

**WHITE MOUNTAIN APACHE TRIBE**  
Fiscal Year 2004 Funding Request

***Water Resources Planning, Management, and Pre-Development (340)***

**Introduction**

In FY2003, the Tribe received approximately \$147,000 out of the \$1.4 million it requested under this grant program. Under the reduced scope of work tied to the limited funding, the Tribe focused its efforts primarily on evaluating municipal and industrial water supply needs and potential supplies for the population of the Fort Apache Indian Reservation [Reservation]. Integral to this effort is the ongoing hydrologic monitoring of water resources and climate on the Reservation. An FY2003 Progress Report has been submitted with this request.

**New Water Supply Development**

A new drinking water supply system for the greater Whiteriver area (10,000 people) is currently in the design phase. EPA and IHS funding will support design and construction of the facility which will divert and treat water from the North Fork White River north of Whiteriver. Treatment will be accomplished with two Microfloc Trident® TR-420A treatment plants. The plants will be enclosed in a fabricated Butler building. Water will be conventionally treated using polymer injection, flocculation, sedimentation, filtration, and chlorination, and placed into the existing Whiteriver water distribution system.

Essential to the successful operation of this new system is the accurate measurement of stream flows above and below the system in the North Fork White River. In order to achieve a finding of no significant impact during the Environmental Assessment process, the Tribe must be able to ensure that sufficient flows will be maintained in the river after diversion. In light of the ongoing drought condition, this task requires vigilant monitoring of stream flows and the rapid notification of Tribal Utility Authority staff in the event that stream flows reach critically low levels. A plan of operation for this facility must be developed in cooperation with IHS and Tribal Utility staff, and must incorporate stream flow trigger points for reduced or discontinued operation of the diversion. Tribal Hydrology staff will be responsible for providing accurate and frequent flow measurements below the diversion system as part of the operational requirements of the diversion facility. Ultimately, these measurements may readily be accomplished by the installation of a new automated stream flow gaging station near the facility. The Tribal Hydrology program requires funds for the installation of such a facility, and for staff necessary to monitor and maintain the station and associated data, as part of the facility operation.

## **Water Conservation Planning**

In May 2003, the Tribal Council of the White Mountain Apache Tribe formally declared the Reservation to be in drought condition. A report by Consulting Hydrologist, Laurel Lacher (2003) documents the current drought situation and provides an analysis of current forecasts. At the time of this writing, forecasters suggest that La Niña conditions are slightly less strong than in June, but they believe that La Niña conditions will occur by fall and will probably persist through the winter months (CLIMAS, 2003).

Also in May of this year, the Tribal Council of the White Mountain Apache Tribe instructed Tribal Hydrology staff to develop a Tribal Water Conservation Plan. This plan is intended to direct efforts needed to reduce waste of potable water from Miner Flat well field and other sources in an effort to avoid a drinking water crisis in the short term. It will also set up a framework for long-term conservation on the Reservation by instilling water conservation values and outlining a plan for leak detection, repair or replacement of faulty or high-water-use fixtures, progressive water pricing, and law enforcement to prevent water waste. The Tribal Hydrologist will coordinate this effort by developing a Water Conservation Task Force comprised of representatives from Tribal Utility Authority, community leaders, irrigation specialists, and others. A list of water conservation priorities and goals will be identified, and ideas for accomplishing these goals will be developed. Public education through local media, schools, and direct community outreach will be one of the most important components of the Tribal Water Conservation Plan.

## **Drought Monitoring**

As cited above, the ongoing drought has driven the Tribe into emergency response measures. Keeping the Tribal Council and Tribal and federal natural resources planning staff informed of current conditions and forecasts is a primary responsibility of the Tribal Hydrology program. Because of the extreme staffing shortage within the Tribal program, a consulting hydrologist will be used to provide semi-annual updates to the Tribal Council and to generate reports detailing drought conditions on the Reservation. Tribal Hydrology staff will also continue to be involved in the Governor's Drought Task Force planning process to ensure that the needs of the White Mountain Apache Tribe are represented and to remain informed of statewide efforts and programs to respond to drought conditions.

## **Runoff Monitoring**

As the Tribe evaluates the potential downstream impacts of a storage facility on the North Fork White River (see FY2004 Water Rights funding request), Tribal water rights and water resources planning experts require information on the quality and quantity of runoff from Reservation streams. Tribal stream gaging stations across the Reservation have been instrumental in supporting this analysis, but additional measurements are

needed. Repeat measurements at sites of historic USGS data, such as on the White River near Fort Apache, will improve the Tribe's understanding of evapotranspiration losses along the White River. Monitoring runoff from the area burned by the Rodeo-Chediski fire also provides an indication of the variation in runoff (both quality and quantity) that may be expected over time.

Quality assurance is maintained by utilization of consulting hydrologists and through consultation with USGS Water Resources Division. The White Mountain Apache Tribe recently became the first tribe in the nation to run the US Geological Survey's Automated Data Analysis and Processing Software (ADAPS) on its own in-house computer system. This step has brought the Tribe into a position of having reliable, defensible data to support its water rights claims.

### **Spring Monitoring**

The accurate characterization of spring flows on the Reservation is a crucial component in the Tribe's efforts to secure its water rights claims. These springs constitute the reliable surface water supply (baseflow) and reflect groundwater recharge.

Documenting trends in spring flows and water quality will be critical to planning future drinking water supply systems. Tribal staff have embarked on a program of targeted monitoring of springs issuing from the transbasin Coconino Aquifer via the Fort Apache Limestone. These springs provide high quality water and serve as indicators of long-term of perturbations in groundwater recharge. Historic records from some of these springs provides a baseline to which modern measurements may be compared. These measurements will likely provide the first indication of impacts to Reservation water resources from off-Reservation pumping.

### **Groundwater Monitoring and Development**

In addition to the specific items listed above, Tribal Hydrology staff must continue their efforts to characterize Reservation water resources. Water level measurements in wells as the failing Miner Flat well field and in monitoring wells along the Mogollon Rim provide important information on the hydrogeology of the transbasin Coconino Aquifer and on the stability of existing and future Tribal drinking water sources. New exploration and monitoring wells are needed for evaluating the potential for water supply development along the Mogollon Rim and for monitoring the impacts of off-Reservation pumping on the transbasin Coconino Aquifer.

### **Other Hydrologic Monitoring**

Snow pack, precipitation, temperature, and evaporation measurements on the Reservation are essential to the Tribe's ongoing efforts to secure its water rights claims. Measurements at off-Reservation stations are helpful but insufficient and often not comparable, so the Tribe's data collection and management efforts are paramount. With permanent funding for only one staff hydrologist, the Tribal Hydrology & Water

Resources program is in dire need of additional funding to carry out this important mission.

#### FUNDING REQUEST

The White Mountain Apache Tribe's FY2004 funding request (see attached budget) includes \$210,623 for Water Resources Monitoring and \$326,032 for Groundwater Exploration. Both items are considered vital to the Tribe's efforts to secure future sources of water for municipal and industrial purposes. The monitoring efforts are integral to the Tribe's ongoing efforts to secure its water rights claims (see FY2004 Water Rights proposal).



## References

CLIMAS, 2003, Southwest Climate Outlook - June 2003, [www.ispe.arizona.edu/climas](http://www.ispe.arizona.edu/climas), Institute for the Study of Planet Earth, Univ. of Arizona.

Lacher, L., 2003, June 2003 Drought Conditions on the Fort Apache Indian Reservation, internal report for White Mountain Apache Tribe.

\*\*\* CONFIDENTIAL \*\*\*

**WHITE MOUNTAIN APACHE TRIBE**  
Fiscal Year 2004 Funding Request

***Water Rights Negotiation/Litigation (344)***

**Introduction**

The White Mountain Apache Tribe's 1.7-million-acre Fort Apache Indian Reservation [Reservation] is the most productive watershed area in the entire Salt River basin. Its surface waters and supporting groundwaters constitute a vital life force for the White Mountain Apache people. Since the development of the Salt River Project [SRP], downstream users in Phoenix have also grown tremendously dependent on these waters. As shown in Table 1, White Mountain Apache lands comprise just over 40% of the total Salt River watershed area above Phoenix, but they have historically provided 70% of all Salt River water delivered to Phoenix.<sup>1</sup> Stream flow from the Reservation makes up about 37% of all SRP water from the Verde and Salt River basins combined.

Table 1.  
Percentages of land area and stream flow attributable to  
Fort Apache Indian Reservation.

% area of Salt River basin at Lake Roosevelt	% area of Salt River basin at Stewart Dam‡	% area of total Salt River Project watershed (Salt + Verde)	% of flow in Salt River at Lake Roosevelt	% flow in Salt River below Stewart Dam	% flow of entire Verde + Salt River system at confluence†
61	42	20	74	70	37
			period of record	period of record	period of record
			1925-2001	1935-2001	1962-2001

‡ Stewart Dam is the lowest Salt River dam in the Salt River Project. It is approximately 10 miles northeast of Mesa.  
† flow of Salt River measured at USGS gaging station below Stewart Dam.

these statistics demonstrate the extraordinary value of the water from the homeland of the White Mountain Apache people, as well as the contentious forces facing the White Mountain Apache Tribe [Tribe] in its effort to secure its aboriginal and other reserved claims to the use of its own waters.

In addition to growing demand for a dependable drinking water supply for its rapidly increasing population, the Tribe has been plagued by 5 years of extreme drought. In 2000, the tribal community of Cedar Creek ran completely out of water

when three wells that had served the community for decades dried up. The wells, which produced water from the alluvium of Cedar Creek, were rendered useless by what may prove to be the most severe drought on record in this area (see Lacher, 2001 and Lacher, 2002). By the end of May 2003, Salt River system reservoirs were filled to only 42% of capacity, or 64% of average. This condition represents a 30% improvement over last year's levels, but it also reveals the system's vulnerability to a prolonged drought.

Forecasting centers at the National Oceanic and Atmospheric Administration, including the National Weather Service and the Climate Prediction Center, as well as local climate experts from the University of Arizona (CLIMAS, 2003; Betancourt, 2003; and others) indicate that the current drought shows little or no sign of abatement in the next several months, and that long term trends of below-normal precipitation may be in store for the next several decades.

Whether exacerbated by drought or off-Reservation pumping, the prospect of continuing declines in surface water runoff, combined with the lack of a reliable groundwater source for drinking water (see Groundwater discussion below), in the face of rapid population growth dramatically heightens the already pressing need for development of a permanent storage facility that will meet the Tribe's drinking water and economic needs. A facility that would supply nearly all of the Tribe's population below the Mogollon Rim until 2050 is proposed for development on the North Fork of the White River at Miner Flat. In order to demonstrate the minimal downstream impact of Miner Flat Dam, the Tribe proposes to develop supporting facts with regard to Tribal surface water depletions and potential alternate water supply sources for downstream users.

### **Legal Framework for Tribe's Water Rights**

The White Mountain Apache Tribe has occupied the lands currently known as the Fort Apache Indian Reservation since time immemorial. It enjoys an unbroken chain of title to those lands. It is well established as a matter of federal Indian and property law that the Tribe has aboriginal and federal reserved rights to the use of surface and ground water on and within its federally recognized trust lands.

The White Mountain Apache Tribe has time immemorial priority rights to the use of water in the Salt River Basin and the Little Colorado River Basin (LCR). It also has reserved rights to the transbasin Coconino Aquifer which underlies both the LCR and Salt River basins and which is the source of the base flow of the Tribe's surface water rights in both basins.

Recently, the Tribe has proposed construction of a Reservation-wide rural water system to ensure a dependable, high quality municipal drinking water supply for the White Mountain Apache Tribe. The authorizing legislation would fund construction of a drinking water storage facility, Miner Flat Dam, on the North Fork White River, and an extensive water delivery system. The facility has been under site and pre-design

investigation for several years. A field extension report, which includes a cost-benefit analysis of the storage facility, will be completed by September 30, 2003.

The storage facility will only have an active storage capacity of 6,000 acre feet, but it will provide a sustainable and reliable source of drinking water for the White Mountain Apache Tribe until the year 2050, when the population served is projected to be 36,800 persons. The 6,000 acre-foot storage represents only a fraction of the claim filed by the United States as Trustee for the White Mountain Apache Tribe in both the Gila River and Little Colorado River general stream adjudications, and an even smaller fraction of what the Tribe has asserted as its rightful reserved water rights. In order to obtain support for the Tribe's project, the Tribe must meet with, and be prepared to explain to, state parties in both general stream adjudications, particularly the Arizona Department of Water Resources and the Salt River Project, regarding the impact that the storage facility at Miner Flat Dam may have on downstream water users, other Indian tribes, and the Gila River Indian Community Water Settlement Act pending in Congress.

State parties have indicated that they will only support the Tribe's Miner Flat Dam project if the Tribe can demonstrate minimal impact of the dam on downstream water users. They have also indicated that they may require the Tribe to participate in negotiations to settle all or a portion of the Tribe's water rights claims in the LCR and Salt River basins as a condition of endorsement of the project. Accordingly, the funding request outlined herein identifies issues and concerns of state parties which must be clarified and investigated by the Tribe. It is no exaggeration to state that the Tribe's long term storage facility at Miner Flat Dam must be constructed within the next eight to ten years in order to meet the drinking water needs of the Tribal population and other residents on the Fort Apache Indian Reservation.

## TECHNICAL STUDIES IN SUPPORT OF TRIBE'S WATER RIGHTS EFFORTS

### **Groundwater**

Tribal staff and consultants have reviewed and continue to monitor the "Kyle study" on the potential impacts of groundwater pumping north of the Mogollon Rim. The Tribe has major concerns that such pumping may impact base flows and groundwater sources of surface water on the Reservation. Severe fish kills at the Alchesay National Fish Hatchery resulting from the drought-impaired record-low stream flows on the Reservation in June 2002 provide a poignant demonstration that the Tribe's economic and natural resources are extremely vulnerable to perturbations in base flows sustained by groundwater recharge.

### **Failure of Miner Flat Well Field**

In December 2001, the Tribe learned that its primary source of drinking water - the Miner Flat well field - is failing at an alarming rate. A consulting report by Morrison-

Maierle, Inc. (2002) describes the failure as a result of dewatering of the aquifer as reflected by water level declines ranging from 9.5 to 30.6 feet per year over the 4 to 6 years since the wells were installed. The reduced saturated thickness of the aquifer has resulted in a 42% decrease in well field yield since 1998 (Morrison-Maierle, Inc., 2002). While initially perceived as an essentially boundless groundwater supply hydrologically connected to the regional Coconino Aquifer along the Mogollon Rim, Tribal experts now believe that the Miner Flat well field is tapping an isolated aquifer unit that receives essentially no recharge relative to the rate of extraction (Morrison- Maierle, Inc., 2002). At the time of this writing, the Tribe is soliciting proposals for the development of a new drinking water supply system that would divert and treat water from the North Fork White River for delivery to 80% of the population on the Fort Apache Indian Reservation. This diversion will replace the failing Miner Flat well field, but projected demand will outstrip even this delivery capacity within 6 to 8 years.

As the Tribe responds to these ongoing water crises, it continues to refine its own regional groundwater flow model to demonstrate potential impacts to Tribal waters from off-Reservation pumping. Additional effort is required to complete the calibration of this model and to incorporate new data as it becomes available. It is anticipated that the Tribe's groundwater model may become the basis for proposing an Active Management Area along the transbasin Coconino Aquifer/Mogollon Rim area in the LCR and Gila River general stream adjudications.

### **Depletion Analysis**

The White Mountain Apache Tribe is the focus of considerable scrutiny with respect to the impact of its future water use for domestic, commercial, irrigation and other purposes. As the settlement process sponsored by Sen. Kyl (Gila River Indian Community water rights settlement, S. 437) concludes and the Salt River Project and other interests in the Salt River Valley assess the remaining water supplies available for future expansion, keen eyes will be concentrating on the level of future depletion by the Tribe.

A depletion analysis is needed to assess the level of impact of future water use by the White Mountain Apache Tribe on the Salt River below Roosevelt Dam. Several alternative levels of future depletion require assessment (i.e., 75,000, 100,000, and 150,000 acre-feet annually). The analysis would be independent of the following factors:

- the purpose for which future water would be diverted, such as for irrigation, domestic, commercial, recreational, stock pond or other purpose.
- the location of diversion from the tributaries of the Salt River that arise on the Fort Apache Indian Reservation, namely Canyon Creek, Cibecue Creek, Carrizo Creek, White River and Black River.
- the source of tributary groundwater discharge from either the Coconino Aquifer or the basalt aquifer.

The depletion analysis would comprehensively assess the operation of Roosevelt Dam over the full period of record using historical inflows, historic change in reservoir

storage, historic evaporation estimates, historic releases (if available), and other less significant parameters in the mass balance equation that will assist in defining all components of inflow, outflow and change in storage. Inflow data from the Salt River and Tonto Creek are available from U.S. Geological Survey gaging stations. Information on water level elevations and storage in Roosevelt Lake is available from the U.S. Geological Survey and the Bureau of Reclamation. It will be necessary to obtain rating curve records from the Bureau of Reclamation to relate both storage and surface area in Roosevelt Lake to water level elevation based on the enlargement of Roosevelt Dam in the 1990s. Evaporation estimates may be available from federal agencies, but if not pan evaporation stations are located in the vicinity and can be used to establish estimates of monthly and annual evaporation from Roosevelt Lake over the historic period of record.

Having fully analyzed the historic dam operation, a monthly simulation study will be used to project the impact of future depletions. The historic releases from Roosevelt Dam will be evaluated to determine if the last 10 years of release are representative of future releases or if some other more appropriate estimator of future releases should be used. These estimated releases are intended to reflect future demand in the Salt River Valley. Monthly future depletion alternatives by the White Mountain Apache Tribe will be imposed at the gaging station on the Salt River above Lake Roosevelt. With reduced inflow to Roosevelt Lake and constant levels of future release by the Salt River Project, reservoir levels will decline in Roosevelt Lake with at least two consequences. The first will be lower rates of evaporation offsetting the upstream depletion. The second will be greater capacity to contain significant floods that would otherwise spill at Roosevelt Dam, further offsetting the upstream depletion. One of the primary purposes of the evaluation will be to quantify these offsets.

For both the historic and future periods of operation, the impact of changes in storage and releases on hydropower generation at Roosevelt Dam, Horse Mesa Dam, Mormon Flat Dam, and Stewart Mountain Dam will also be evaluated. Therefore, the impact on future releases, reservoir levels in Roosevelt Lake, and hydropower will be analyzed.

Other opportunities for analysis may be presented based on the results of the simulation studies. For example a schedule of modified releases from Roosevelt Dam that would maintain water levels at higher elevations may be considered. A report summarizing the finding of long-term, monthly simulation studies will be delivered as the product of this effort.

### **Salinity Investigation**

Federal and state agencies in Arizona have undertaken in a salinity study (Central Arizona Salinity Study or CASS) in the Gila River Basin to determine the sources and causes of increased salt accumulation in the Salt River Valley. Several factors are known to be contributing to the accumulation of salt in the Valley:

1. Groundwater recharge from discharging wastewater facilities serving an ever-expanding population of several million is introducing more salt into the groundwater system.
2. Central Arizona Project is delivering water with greater salinity concentrations than the historic sources of water, including the Salt River.
3. Historic concentration of salts by irrigation throughout the Valley.

4. Elimination of the natural discharge from the Valley (Gila River) keeps salts from exiting the system.

The adverse affects of high salinity in municipal and natural groundwater systems include accelerated rates of corrosion in residential, industrial and commercial water fixtures, water heaters and other infrastructure as well as deterioration of soil structure by the replacement of clay particles with sodium when dissolved in water. As salinity increases, compliance with discharge permits requires increasingly greater levels of treatment. Cost impacts of the increasing salinity are currently being summarized by Bureau of Reclamation and others, but it is known that the costs are significant in relation to the population of the area under investigation.

The White Mountain Apache Tribe seeks to establish baseline conditions by determining the level of salinity, total dissolved solids, and other chemical constituents in the surface waters of the Salt River at the gaging stations near Roosevelt and Chrysotile. A sensitivity analysis will be conducted by relating all available water quality data and stream flow data will be correlated for the recent segments of the record. For the more distant segments of the record, correlation will determine if there are significant changes in concentration over time that could be attributed to the White Mountain Apache Tribe or other upstream interests. Moreover, the effect on salinity of depletions outlined in the previous task will be assessed to determine impact using mass balance techniques.

### **Agriculture and Livestock**

Tribal attorneys continue to search for an agricultural and a livestock economist to conduct detailed analyses of the Tribe's current and anticipated future water use through farming and ranching, and a market analysis of agricultural potential on the Reservation. Included in this category is updating the Tribe's 1980 soils analysis to evaluate soil suitability for crop and livestock agriculture development. Although the Arizona Supreme Court has made clear this issue must be considered when quantifying Indian reserved water rights, no BIA funding has been awarded for this crucial task to date,

### **Historical Irrigation and Water Use**

The Tribe retained an historian to conduct an evaluation of historical water use and irrigation on the Fort Apache Indian Reservation. Historic water use and irrigation are among the several factors identified by the Arizona Supreme Court to be considered in quantifying a tribe's water rights. To date, the Tribe's consulting historian has provided thousands of pages (several linear feet) of documentation which now must be reviewed, organized, and consolidated by Tribal consultants in advance of future court-ordered hydrographic survey reports for the Fort Apache Indian Reservation, and to support, advance, and defend the

Tribe's water rights claims. In addition, because the Tribe's funding request was not granted last year, completion of the historical work was postponed. Funding is needed to complete this critical work necessary to the Tribe's water rights claim.

### **Power Reserve Claims**

The consulting historian has provided historic documents related to the water and power sites on the Reservation. The Department of Justice has made a claim based on these sites in the Gila River general stream adjudication. These documents must be reviewed, analyzed, and supplemented as necessary. In addition, the Tribe is seeking an energy consultant to estimate the value of the Secretarial power reserves on the Reservation to assist the Tribe in its decisions regarding their inclusion in the Tribe's water rights claim.

### **Future Sources of Water for Downstream Interests**

The final report from the Governor's Water Management Commission (2001) acknowledges the likely prospect that the Salt River Valley will have exhausted all available supplies of water including Salt River Project, Central Arizona Project and existing groundwater sources, by year 2025:

*"In the Phoenix and Tucson AMAs, water budgets based on current supply availability projections, indicate that achieving safe-yield may not be as difficult as maintaining that condition. The Assured Water Supply (AWS) Rules require that municipal growth utilize renewable supplies or replenish groundwater use in the AMAs. However, the expected population growth beyond 2025, particularly in the major metropolitan areas, may ultimately exceed the availability of renewable supplies and result in increasing costs for providing renewable water supplies and again put pressure on groundwater availability" (Governor's Water Management Commission, 2001). (Emphasis provided)*

The White Mountain Apache Tribe has prior and superior rights to the use of waters of the Salt River and its tributaries, including the transbasin tributary Coconino and volcanic aquifers, on the Fort Apache Indian Reservation. The Tribe also has a rapidly growing population projected to exceed 100,000 persons by year 2100. This growing population will require increasing use of water from the reserved water rights of the Tribe. As part of its effort to preserve and protect its rights to the use of its water, the Tribe needs to identify future sources of water for the downstream interests to offset the future uses of water by the Tribe. Those potential sources of future supply include unallocated Central Arizona Project water, dependable water afforded by the enlargement of Roosevelt Dam, reclaimed wastewater, water saved by increased water conservation, unused ground waters of the Salt River Valley subject to statutory limitations, and imported water from basins outside the Salt River, currently limited by statutory prohibitions. An additional source of future downstream supply of considerable magnitude is water now used for agriculture in the Salt River Valley that can be converted to M&I use to meet future downstream demands. These potentials will be



investigated and quantified to demonstrate the options available in the Salt River Valley to meet future demands subject to increasing use of water by the White Mountain Apache Tribe and corresponding loss of available supplies from the Salt River. The Tribe proposes to review all relevant literature on future population growth and water requirements of downstream interests. Sources of this information are expected to include State and local government agencies (eg, ADWR, municipal water suppliers), private corporations (SRP), federal agencies (USGS, BOR, CAP, and others), and universities. The documents will be reviewed for the purpose of developing a summary report on the level of downstream development that is contemplated and the potential sources of water necessary to meet projections. This report will assist the Tribe in discussions with decision-makers on the need to protect from downstream reliance the water rights of the White Mountain Apache Tribe. (\$50,000).

## FUNDING REQUEST

Please refer to the attached table for a detailed budget itemized by task. The funding requested for technical consultants will support the development of reports, presentations to, and meetings with, state and federal agencies and others in direct support of the Tribe's water right claim, and the development of background information vital to the Tribe's water rights claim case. In FY2004, meetings with ADWR, other Indian tribes, SRP, Department of Interior Indian Water Rights division, and others are anticipated as the Tribe continues to pursue funding to complete development of a crucial storage facility on the North Fork of the White River (Miner Flat Dam). The technical consultants/experts will also work closely with Tribal water rights attorneys to keep the Tribal Council informed on the progress of the Tribe's water rights claim, make recommendations regarding intervention in the state general stream adjudications, and provide guidance to Tribal technical staff regarding the collection of data in support of the Tribe's claims. Finally, the technical consultants/experts will continue to conduct detailed briefings in coordination with DOJ and BIA representatives to clarify elements of the DOJ's claim for the Tribe as well as the Tribe's own claim.

Total Request: \$ 397,400

## References

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Governor's Water Management Commission, 2001, Final Report (<http://www.water.az.gov/adwr/Content/Publications/files/FinalReport.pdf>), 97 pp.

Morrison-Maierle, Inc., 2002, Performance Evaluation - Miner Flat Well Field, White Mountain Apache Tribe, Fort Apache Indian Reservation, prepared by M. Kaczmarek, 163 pp.

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<sup>1</sup>USGS NWIS database - annual statistics from Salt River near Chrysotile and Salt River below Stewart Dam.