Promoting Sustainability in the Inyo-Mono Region: Understanding Regional Groundwater Resources and Upgrading Infrastructure in Disadvantaged Community Water Systems

Attachment 7: Technical Justification

Introduction

Below are Technical Justifications in support of the four projects included in the Inyo-Mono Round 2 Implementation proposal. All four of the proposed projects will benefit economically disadvantaged communities in the Inyo-Mono planning region. All four of the proposed projects also address identified priority needs for the Inyo-Mono region using methodological approaches that are technically justifiable and in one case, the most cost-effective.

Big Pine Fire Protection Improvement Project

Project Summary

Wildfire and isolated residential fires have caused extensive destruction of homes and other property over the past decade on the Big Pine Indian Reservation and within the town of Big Pine. The Big Pine Paiute Tribe of the Owens Valley (BPPT) and the Big Pine Community Services District (BPCSD) are integrating fire hydrant water infrastructure needs to improve fire protection on the reservation and the adjacent town. This project will replace 38 hydrants on the BPPT public water system which are no longer able to be repaired because parts are obsolete or have reached the end of their useful life. In addition, this project will install four new hydrants to the BPCSD water system because of a lack of hydrants, as well as replace one antiquated hydrant. This project is the first time that the BPPT and BPCSD have collaborated together by integrating their needs for a shared benefit. The implementation of this project will provide needed infrastructure upgrades for improved access to water at fire hydrants to assist the local volunteer fire department and other fire agencies in extinguishing fires within the two communities.

Technical Justification

Due to the fire history in the Big Pine area, there is a need for increased fire protection. BPPT has experienced seven catastrophic household fires in the past nine years which could have posed less of a danger to the rest of the community if fire hydrants were able to perform at their peak performance. Reasons for the catastrophic nature of these household fires have been noted as either due to a lack of working fire hydrants within the proximity of the home or due to a lack of sufficient fire flow. The sufficient fire flow issue is being resolved through a separate project being conducted by the Tribe to increase the mainline distribution pipe size from 4" to 6" at various areas throughout the distribution system. The project being proposed here will complement the water line replacement project by installing new fire hydrants throughout the distribution system to increase the safety of the residents, prevent a wildfire from spreading to other areas and reduce the likelihood of water quality impacts on Big Pine Creek.

The BPCSD has also experienced catastrophic household fires as wildfires have ignited residences in their service area. The most notable of the recent fires, the Center Fire of March 2011, resulted in the loss of 19 homes within the BPCSD service area.

BPPT installed two fire hydrants in 2009, conducted a fire hydrant excavation to gather knowledge about replacement needs and collected quotes from local businesses to determine the labor and material cost for replacing and installing fire hydrants as a part of this project. The Big Pine Volunteer Fire Department Chief, John Marzano, was consulted for needs of the fire department in replacing hydrants and assistance in deciding locations for the installation of new fire hydrants. The Indian Health Service (IHS), an agency within the Department of Health and Human Services, is responsible for providing federal health services to American Indians and Alaska Natives. One of IHS' tasks is to provide safe drinking water to American Indians. In order to accomplish that task, IHS provides engineering services for federally recognized tribes. Brandon Beckman, IHS Project Engineer, has assisted BPPT with this project by conducting a fire flow analysis, creating an engineering design for watermain improvements (which includes fire hydrant schematics and notes) and consulting with BPPT on costs. BPCSD has a contract

water operator, David McMurtank, who helped develop the project proposal costs and workplan for the BPCSD portion of the project based on local knowledge and expert opinion.

Project Physical Benefits

The physical benefits of the project are based on avoided costs for fire-related impacts. The loss of 26 homes in Big Pine over the last decade due to fire has placed a tremendous financial and social burden on the community. The estimated median house or condo value for Big Pine in 2009 was $232,829 (http://www.city-data.com/city/Big-Pine-California.html#ixzz2A9WpxvaK). Therefore, the destruction of 26 homes to fire in Big Pine over the last 10 years has resulted in a financial loss of over $6 million dollars.

The avoided costs related to completing mitigation projects to decrease sediment loading in Big Pine Creek due to fire impacts is another physical benefit of the project. The Oak Creek drainage has very similar hydrogeological features as the Big Pine drainage and is located 25 miles to the south. "In 2007, the Inyo Complex Fire burned approximately 60% of the watershed, approximately 6% was burned at high severity, 34% at moderate severity, and 60% at low severity. In 2008, a large debris flow triggered by an intense localized thunderstorm caused extensive hillslope rilling and gullying of the mid- and lower elevation segments of Oak Creek" (FY2011 Transition Watershed Restoration Action Plan, Inyo National Forest). The estimated cost to reduce sediment loading associated with the action plan is $543,000. Big Pine Creek has not experienced the sediment loading in connection with fire impacts that occurred within Oak Creek; however, the potential exists for a similar event to occur.

This project supports other projects being submitted in the Proposal, particularly the Inyo County Disadvantaged Communities Meters Project. This project and the Inyo County project both serve to address the need to update antiquated infrastructure for small water systems serving disadvantaged communities within the Inyo-Mono region. More broadly, this project, combined with all other projects in this proposal will serve to increase understanding of regional surface water and groundwater issues and needs in addition to continuing to build region water-management related capacity.

There are no potential adverse physical effects as a result of this project.

Annual Physical Benefits

See Table 9 below.

Table 9 – Annual Project Physical Benefits			
Project Name: Big Pine Fire Protection Improvement Project			
Type of Benefit Claimed: Avoided Cost			
Measure of Benefit Claimed (Name of Units): Number of Homes Destroyed by Fire			
Additional Information About this Measure: Each home has an estimated worth of $232,829			
(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (b) – (c)
2012			
2013			
2014	2.5	0.25	2.25
2015	2.5	0.25	2.25
2016	2.5	0.25	2.25
2017	2.5	0.25	2.25
2018	2.5	0.25	2.25
2019	2.5	0.25	2.25
2020	2.5	0.25	2.25
2021	2.5	0.25	2.25
2022	2.5	0.25	2.25
Last Year of Project Life	2.5	0.25	2.25
Total	25	2.5	22.5
Comments: (b) 25 homes lost = $5.8 million dollars; (c) 2.5 homes lost = $582,072; (d) Avoided Cost = 22.5 X $232,829=$5.24 million dollars (non-discounted value)			

Amargosa Basin Water, Ecosystem Sustainability, and Disadvantaged Communities Project

Project Summary

A high-priority need in the Inyo-Mono IRWM planning region is an improved understanding of the character of groundwater basins underlying the region, including the movement, quantity, and quality of groundwater resources. More than 90% of domestic water resources in the southern half of the region originate as groundwater. Pressures on water resources continue to mount, stemming from agriculture, domestic production, and more recently, solar energy developments in the Amargosa Basin. More knowledge about the nature of groundwater basins will help to inform management decisions about domestic, agricultural, industrial, and ecological uses of this precious resource. The proposed project will result in critically needed information regarding groundwater location, movement, quality, and losses in the Amargosa Basin. Such information will then be used to support long-term planning and management of groundwater resources in the region.

Technical Justification

The Amargosa River Basin of Eastern California and Nevada supports one of the largest arrays of endemic and rare plant and animal species in the United States. Groundwater and surface water in the basin support a unique and diverse ecosystem, a free flowing river, and a domestic water supply for the severely economically disadvantaged communities of Shoshone and Tecopa. Groundwater and spring flow supply municipal, domestic, agricultural, wildlife, stock-watering, mining and other industrial uses in the area. Because the flowing portion of the Amargosa River is a groundwater-fed surface water body, relatively small variations in the groundwater surface elevation can affect spring flow and surface flow in the river. Minor lowering of the groundwater surface in the area could have crippling effects on springs, seeps, and wells that supply human and natural communities and the local economy. From previous studies it has been discovered that groundwater flow within and among the five basins making up the Amargosa River watershed is complex. Adding to that complexity, multiple jurisdictions exist within the study area, including two states, federal government land, and private property. Overdrafting of groundwater is a real and constant threat in the Amargosa Basin system.

While the hydrology of the Nevada portion of the bi-state basin has been relatively well-studied through hydrologic studies centered on the Nevada Test Site and the Yucca Mountain Project, the California portion of the basin has seen few regional hydrogeologic investigations. Collaborative groundwater investigations of the California Amargosa have begun[1], but are far from complete. Thus, it is not yet known where, or how much, groundwater extraction can occur before devastating impacts to flora, fauna, and human communities are observed. This grant would provide essential missing information.

The following technical justification of the proposed project summarizes the project's physical benefits. This project is essential to determining, managing, and maintaining the water supply

[1] Partners in and contributors to this work, in addition to Inyo County and the Amargosa Conservancy, include the BLM, the US Geological Survey, The Nature Conservancy, and Nye County, Nevada.

and the associated ecological features and local economies of very disadvantaged Mojave Desert communities.

Physical Benefits

The proposed project will provide critically important benefits to the local disadvantaged communities of Tecopa and Shoshone. The project will probe the sources and extent of groundwater resources in a region of complex and largely unstudied hydrology. Tecopa currently does not have access to a supply of drinking water that meets federal and state standards. This project would materially assist in finding and protecting new sources of drinking water, assuring protection of the public health and the survival of the local economy. The low-income populations of far southeastern Inyo County are almost wholly supported by tourism and entirely dependent on threatened groundwater resources. The unique, world-class ecological features of the Amargosa region are dependent on the same groundwater resources and are important to maintaining the tourism-based economy. The federally-designated Amargosa Wild and Scenic River and a long list of endemic and listed plants and animals--as well as human uses--are at severe risk due to over-allocation of water resources and future proposed water development projects in the bi-state basin. This project will provide vital information to protect both human and ecological life in this desert region.

This study is part of a larger, regional effort to implement a groundwater regional water management program for the Inyo-Mono IRWM Program. In conjunction with this project, the Indian Wells Valley Brackish Water Resources Study aims to better understand groundwater dynamics in the southeastern portions of the Inyo-Mono region. Collectively these two projects will help the region improve the management of groundwater resources. Additionally, information derived from both studies will enhance current CASGEM monitoring. As with all of the projects being proposed in this application, the two groundwater projects are related in that knowledge and information gained from each of the projects will be communicated to the Inyo-Mono RWMG, which will continue to help the region build capacity to address water-related needs.

There are no potential adverse physical effects as a result of this project.

Annual physical benefits

See Table 9 below.

Table 9 – Annual Project Physical Benefits **Project Name: Amargosa Basin Water, Ecosystem Sustainability, and Disadvantaged Communities Project** **Type of Benefit Claimed: Quantification of groundwater dynamics and loss to evapotranspiration** **Measure of Benefit Claimed (Name of Units): Acre-feet** **Additional Information About this Measure:**			
(a)	**(b)**	**(c)**	**(d)**
	Physical Benefits		
Year	**Without Project**	**With Project**	**Change Resulting from Project (b) – (c)**
2013-2015	Unquantified amount of groundwater movement and loss to evapotranspiration	Quantification of groundwater location and movement; quantification of groundwater loss to evaportranspiration	Given the nature of this project, the amount of groundwater movement and location in the Amargosa region is unquantified. This study will provide the necessary information and data to quantify location, movement and loss of groundwater to evapotranspiration.

Inyo County Disadvantaged Communities Meters Project

Project summary

In the Inyo-Mono IRWM region, there is an ongoing and pressing need to upgrade infrastructure to improve water system efficiency and reliability. This need is particularly apparent in the disadvantaged communities of the region, including the Inyo County communities of Laws, Independence, and Lone Pine. Meters were installed in these towns by the Los Angeles Department of Water and Power (LADWP) in 1979 and have not been replaced since. Today, many of the meters are non-functional or do not accurately report water use. This project would provide a full meter replacement with new digital meters in the three water systems. This project is an early step in a much-needed process of re-examining rate structures and developing a capital improvement plan for these water systems.

Technical Justification

Approximately 1,798 acre-feet of water have been unaccounted for over a 12-year period in the disadvantaged communities of Laws, Independence, and Lone Pine. The most likely cause is the 33-year-old meters, the manual nature of meter reading, and the problematic billing system. Inaccurate billing has also led to conflicts among Inyo County, LADWP, and ratepayers. The need for water meters is a given. California legislation requires that homes built after 1992 have water meters, and that all existing connections be metered by 2025. This project seeks to remedy this defect in the distribution system and the replace the billing software.

Two options exist with respect to meter replacement in these three systems: (1) replacing old water meters with analogue meters, or (2) replacing old meters with Automatic Meter Reading (AMR)/digital meters. This project proposes to replace old meters using AMR meters as the more cost-effective approach based on the following analysis.

Known parameters:

1. 1% replacement of meters will be required per year, regardless of meter type. A total of 950 meters will be installed. Annual replacement of 10 meters per year will be required.
2. Analogue meters cost $162/unit, AMR/digital meters cost $346/unit.
3. Time required for reading analogue meters per bi-monthly billing period is 78 hours/billing period based on Inyo County records. Time required for reading AMR/digital meters is 16 hours/billing period based on a simulated drive-through of the Independence water system, and then extrapolating that result across the other two systems. The simulated drive-through was undertaken at about 15 miles per hour.
4. Time required for billing using analog meters is 115.5 hours/billing period based on Inyo County records. Time required for billing using AMR/digital meters is 6 hours/billing period based on discussions with billing systems providers using optical reading devices.
5. Approximate hourly wages for contractor staff to read meters is $50/hour and prepare bills is $30/hour based upon communication with the contractor.
6. Both analogue and AMR/digital meters have an expected lifespan of 20 years.

The table below summarizes the Capital, Operating, and Replacement costs for each alternative. Maintenance costs will be identical; therefore they were not included.

Summary of Project Capital, Replacement and Operational Costs		
	Analogue meters	AMR/Digital meters
Total Project Costs	$732,799	$913,433
Cost difference between analogue and AMR/digital projects	**$180,634**	
Annual Capital Costs	Analogue Meters	AMR/Digital Meters
Per Meter Cost	$162	$346
Annual Expected Replacement (units)	10	10
Annual Replacement Costs	**$1,620**	**$3,460**
Operational Costs	Analogue Meters	AMR/Digital Meters
Per billing Period (6 per year)		
Vehicle Costs Costs per Billing Period (based upon miles driven & IRS mileage rate $0.565/mi)	$107	$67
Meter Reading Staff Costs per Billing Period (based on number of hours X hourly rate)	$3,900	$800
Customer Billing Staff Costs per Billing Period (based on number of hours X hourly rate)	$3,464	$180
Annual Operational costs (billing period rates X 6)		
Annual Vehicle Costs	$644	$400
Annual Meter Reading Staff Costs	$23,400	$4,800
Annual Customer Billing Staff Costs	$20,786	$1,080
Total Annual Operational Costs	**$44,830**	**$6,280**
Total Annual Operational and Replacement Costs	***$46,450***	***$9,740***

As demonstrated in the above table, the big difference between the two systems is found in the meter reading and billing costs. Meter reading is estimated to be much faster with AMR meters, which utilize a system that can read up to or more than 6,000 meters per day. Only a few minutes are required to upload those reads into the billing system. Bills contain a barcode identifying the person, account number, and amount due. The use of an optical reading device to scan the barcode of the paid bills into the system shortens the time to enter bills to minutes rather than hours.

The AMR system, although more expensive initially, is the less costly alternative over the course of the project life of 20 years. AMR project costs are $913,433; the project cost for analogue meters would be $732,799 (both in 2012 dollars). Taking into consideration net present values, at the end of the project life of 20 years the AMR option is the least costly alternative (see Table 11, Cost Effectiveness, for this project in Attachment 8).

Annual Physical Benefits

See Table 9 (parts A and B) below.

Table 9 – Annual Project Physical Benefits Project Name: Inyo County Disadvantaged Communities Meters Project Type of Benefit Claimed: (A) Reduction in unaccounted for water; (B) Reduced O & M expenses (next page) Measure of Benefit Claimed (Name of Units): (A) Acre-feet; (B) Dollars Additional Information About this Measure: (A) Difference between groundwater pumping and end-use meter reading			
(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (b) – (c)
(A) 2016-2033	Unknown quantity of unaccounted-for water	More accurate quantification of domestic water use versus system leakage.	By installing new meters, the amount of water being pumped compared to actual water use will be determined. This will in turn allow for more accurate determination of leakage in the three water systems supporting disadvantaged communities. At this point, quantification of the amount of water lost to leakage versus amount of domestic water use cannot be determined.

(B) Reduced O & M expenses

(a)	(i)	(b)	(c)	(d)	(e)
Year	Discount Factor [1]	Costs Associated with Analog Meter	Discounted Costs-Analog Meters	Costs Associated with AMR system	Discounted Costs- AMR
2012	1.000				
2013	0.943	$732,799	$691,029	$913,433	$861,367
2014*	0.890	$46,450	$41,341	$9,740	$8,669
2015	0.840	$46,450	$39,018	$9,740	$8,182
2016	0.792	$46,450	$36,788	$9,740	$7,714
2017	0.747	$46,450	$34,698	$9,740	$7,276
2018	0.705	$46,450	$32,747	$9,740	$6,867
2019	0.665	$46,450	$30,889	$9,740	$6,477
2020	0.627	$46,450	$29,124	$9,740	$6,107
2021	0.592	$46,450	$27,498	$9,740	$5,766
2022	0.558	$46,450	$25,919	$9,740	$5,435
2023	0.527	$46,450	$24,479	$9,740	$5,133
2024	0.497	$46,450	$23,086	$9,740	$4,841
2025	0.469	$46,450	$21,785	$9,740	$4,568
2026	0.442	$46,450	$20,531	$9,740	$4,305
2027	0.417	$46,450	$19,370	$9,740	$4,062
2028	0.394	$46,450	$18,301	$9,740	$3,838
2029	0.371	$46,450	$17,233	$9,740	$3,614
2030	0.350	$46,450	$16,258	$9,740	$3,409
2031	0.331	$46,450	$15,375	$9,740	$3,224
2032	0.312	$46,450	$14,492	$9,740	$3,039
Last Year of Project Life	0.294	$46,450	$13,656	$9,740	$2,864
Total Present Value of Discounted Benefits			$1,193,619.54		$966,754.12
Net Savings by Using AMR Meters				$226,865	

* Costs starting in 2014 are annual operation, maintenance and replacement costs.

This project supports other projects being submitted in the Proposal, particularly the Big Pine Fire Protection Improvement Project. This project and the Big Pine project both serve to address the need to update antiquated infrastructure for small water systems serving disadvantaged communities within the Inyo-Mono region. More broadly, this project, combined with all other projects in this proposal will serve to increase understanding of regional surface water and groundwater issues and needs in addition to continuing to build region water-management related capacity.

There are no potential adverse physical effects as a result of this project.

Indian Wells Brackish Water Resources Study

Project Summary

Ridgecrest, CA, and the surrounding environs comprise a rapidly-growing region in the eastern California desert. The communities in this region, several of which are economically disadvantaged, rely solely upon groundwater for domestic, industrial, agricultural, and military uses. Currently, the groundwater basin is being overdrafted by 1 to 1.5 feet per year. Although water managers in the area know that brackish water makes up a portion of the groundwater basin, it is not known precisely where, what amount, and what quality of brackish water is available. This project, building upon previous work completed in the basin, will investigate the location, amount, and quality of brackish water in the Indian Wells Valley as a next step towards a project to begin desalting brackish water. This study will also contribute to the Inyo-Mono IRWM groundwater resources management program by providing needed information about a little-understood resource.

Technical Justification

The proposed project is essential to the Indian Wells Valley Water District's mission of providing reliable supplies of good quality water to its customers. As noted in the Budget Narrative, the Brackish Water Resources Study (this project) is Phase III of a five-phased approach to solving a critical water supply issue in the southern portion of the Inyo-Mono IRWM region. *Physical benefits* derived from the proposed project include the identification and provision of reliable, high-quality water supplies to communities within the Indian Wells Valley. As an output of this project, water quality benefits will be realized via the identification of locations of brackish water of varying quality. Water supply benefits derived from this project result from (1) identification of source water and (2) treatment and delivery of domestic water supplies to communities within the purview of the Indian Wells Valley Water District, several of which are economically disadvantaged. Given the proposed project is one phase of the larger effort, it is difficult to quantify either the water quality or water supply benefits.

Groundwater is the sole source of drinking water supply for people living in the Indian Wells Valley groundwater basin. Groundwater levels have been chronically declining in the basin on an average of 1 to 1 ½ feet per year for over 50 years without recovery. The water budget developed for the basin indicates total recharge off the eastern face of the Southern Sierra Nevada Mountains of approximately 7,500 acre-feet per year with underflow into the basin primarily from the north of roughly 1,500 acre-feet per year. Outflow is from evapotranspiration of 6,000 acre-feet per year, and pumping of 24,000 acre-feet per year. This water balance suggests an estimated annual ground water recharge shortfall (overdraft) of roughly 21,000 acre-feet of water in the Indian Wells Valley groundwater basin. Additionally, previous studies of the Indian Wells Valley groundwater basin indicate that the water budget is not only in a deficit, but also that the water of highest quality and lowest salinity is currently being extracted, and groundwater salinity has increased in a few areas in the basin over time.

An additional challenge that the Water District faces in the basin is spatially managing growing cones of depressions around pumping wells. The Water District has modeled alternative

pumping scenarios and has developed several options to alternate pumping and help reduce the extent of these cones of depression over a wider area.

The Water District's alternatives for developing new water supplies are extremely limited. The current efforts to address the water supply deficit in the basin include tiered water rate structure, several water conservation ordinances, public water conservation education, increasing recycled water use through wastewater treatment plant expansion/upgrade, and investigating an imported water supply project. Current tiered water rates and conservation efforts have been quite successful and have reduced water demand significantly. Preliminarily planned recycled water expansion by the City of Ridgecrest is projected at peak capacity of 6 million gallons/day or optimistically about 6,000 acre-feet year. The Water District has in the past and continues to develop a partnership with Los Angeles Department of Water and Power for an imported water supply and groundwater recharge project through the Los Angeles Aqueduct: these discussions have yet to yield a possible project (but efforts will continue). Brackish water desalination has been previously assessed, and the results of a treatability study tested at 3,000 acre-feet per year reported that the treatment technology worked and provided some rough capital and operational costs for a treatment system. *This summary clearly indicates that, not one or even some, but all of the alternatives discussed above will be needed in the future to meet water supply demands in the Indian Wells Valley groundwater basin because of the large water budget deficit.*

Development of brackish water supplies is not new, is a well-tested and proven technology, and is a growing water supply alternative globally and specifically in California. The question is not whether this alternative is technically justifiable; it is a question of what are the best alternative locations for the brackish water extraction wells, treatment plant technology and location, and amount of brackish groundwater that can be withdrawn, treated, used and recharged to groundwater.

Brackish water sources identified through the Brackish Water Resources Study could help meet the urgent water needs of the Water District. The proposed study will provide vital information necessary to responsibly manage critical water supply and water quality issues facing the local communities. The knowledge and information collected from the proposed project would help develop improved water source reliability and contribute to the long-term benefits of this growing inland community. The results of the proposed project would also become the basis for future decision-making activities associated with ensuring a reliable local water supply, helping to address groundwater quality issues, and providing a potential source for groundwater recharge. Being able to extract brackish groundwater away from the current low saline groundwater areas would further help manage the spatial aspect of the cones of depression formed from current focused pumping areas

This study is part of a larger, regional effort to implement a groundwater regional water management program for the Inyo-Mono IRWM Program. This project, in conjunction with the Amargosa Basin project, aims to better understand groundwater dynamics in the southeastern portions of the Inyo-Mono region. Collectively these two projects will help the region improve the management of groundwater resources. Additionally, information derived from both studies will enhance current CASGEM monitoring. As with all of the projects being proposed in the proposal, these two projects are related in that knowledge and information gained from each of the respective projects will be communicated to the Inyo-Mono RWMG, which will continue to help the region build capacity to address water-related needs.

There are no potential adverse physical effects as a result of this project.

Annual Physical Benefits

See Table 9.

Table 9 – Annual Project Physical Benefits **Project Name: Indian Wells Valley Groundwater Basin Brackish Water Resources Study** **Type of Benefit Claimed: Increased supply of groundwater** **Measure of Benefit Claimed (Name of Units): Acre-feet of groundwater identified** **Additional Information About this Measure: This project will determine the availability and quality of groundwater sources in the Indian Wells Valley.**			
(a)	**(b)**	**(c)**	**(d)**
	Physical Benefits		
Year	**Without Project**	**With Project**	**Change Resulting from Project (b) – (c)**
2013-2014	Increased scarcity of groundwater resources necessary to supply communities served by the Indian Wells Valley Water District	Identification of groundwater quality and sources that can be treated for domestic use in communities served by the Indian Wells Valley Water District	This project will determine the *availability and quality of groundwater* in the Indian Wells Valley. Once project is completed, Indian Wells Valley Water District will be able to determine actual quantity of groundwater resources available for treatment and eventual supply to served communities.