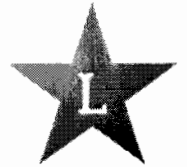

**World Water Forum College Grant Program
2007 Grant Proposals**



College

CSU Northridge (1)

Faculty

Dr. M. Ali Tabidian

Project

Analysis of Selected Aquifer Characteristics
and Hydrostratigraphy of the South Las Posas
Basin, Ventura County

December 11, 2007

Benita Lynn Horn, Project Coordinator
Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

SUBJECT: Southern California World Water Forum Innovative Conservation Research and Technology Grant Program – Proposal Submittal

Dear Ms. Horn:

On October 12th, 2007, we attended your World Water Forum event in Los Angeles to obtain information about your College Grants Program. Department of Geological Sciences at California State University, Northridge, is pleased to submit the accompanying proposal for your review. We look forward to your partnership and our cooperative efforts to facilitate research efforts for the following project:

Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County, California (Author: Kenda Neil)

This proposal request is for \$10,000 to facilitate this research. Ms. Neil's research project falls under category C1 (Develop Conservation Prototype). This research focuses on local, water-related issues or problems, while concurrently creating new technological approaches for water conservation and management.

Thank you for your interest and supporting our hydrology program, and for the opportunity to partake in both the World Water Forum event (October 12, 2007), and the Southern California World Water Forum Innovative Conservation and Research and Technology Grant Program. We envision building upon our collaborative success by developing partnerships and promoting new and innovative technological approaches for water conservation and management within the Southern California Municipal Water District region in general and the Calleguas Water District of Ventura County in particular.

Respectfully submitted,

M. Ali Tabidian

Dr. M. Ali Tabidian
Department Chair and Professor, Hydrogeology
Department of Geological Sciences

CONTACT INFORMATION

A. College

California State University Northridge
18111 Nordhoff Street
Northridge, CA 91330
www.csun.edu

Make check payable to: CSUN Foundation, Geology Department

B. Applicant

First Time – Local Project

C. Student Project Manager

Ms. Kenda L. Neil
Graduate Candidate
Department of Geological Sciences, 18111 Nordhoff Street, Northridge, CA 91330-8266
805-482-8852
805-377-6505
enviroluv2@aol.com

D. Faculty Project Manager

Dr. M. Ali Tabidian
Department Chair and Professor, of Hydrogeology
Department of Geological Sciences
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Ali.tabidian@csun.edu

E. Organizational Background:

To evaluate the effectiveness of our Department's mission and goals, the Department of Geological Sciences has developed a program-level plan for assessment of student learning. The **mission** of CSUN's B.S. and M.S. degree programs parallels that of the University: to prepare students to be life-long learners so that they may become productive members of the workforce. CSU Northridge use rubrics to quantify and assess the achievement of specific Student Learning Outcomes (SLOs) in different department courses. Because they are a small department, faculty-student relationships are strong, and they are able to assist our students on an individual basis. This allows the department to better accommodate students with diverse economic, social, and academic backgrounds. The Department offers the B.S. and M.S. in Geology and a minor in Geology. For the B.S. degree, three options are available: Geology (Option I), Environmental Geology (Option II), and Secondary Teaching (Option III).

The following list displays past and current research projects at CSU Northridge (Geology Department) under direction of Dr. M. Ali Tabidian, Department Chair and Professor, of Hydrogeology

1. Hydrogeologic Masters Theses in Progress

- George Clark - Numerical Modeling of a Groundwater Dewatering Project in Simi Valley, Ventura County, CA
- Mark Gannett - Hydrogeologic Characteristics of Aquifer (s) Underlying Sepulveda Basin, West San Fernando Valley, California
- Colleen Garcia - Hydrogeology of the Upper-Reach Areas (Canyons) of the Los Angeles River Drainage Basin in Western San Fernando Valley, CA
- Rana Khan - Groundwater Modeling of Eastern Half of Simi Valley Using U.S.G.S. MODFLOW, Ventura County, CA
- Eric Margrave - Numerical Simulation of a Proposed Artificial Recharge System in Antelope Valley Wash, California
- Kenda Neil – Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County, California
- Anita Regmi - Characterization of Vadose Zone and Assessing Enhanced Recharge Potential in Headwater Areas of Western San Fernando Valley, California
- Snejana Toneva - Temporal and Spatial Distribution and Potential Sources of Perchlorate in Soils and Water Resources of Ventura County and San Fernando Valley, California

2. Masters Theses Completed

- Miles, Jack, 2007. Water Quality and Land Use in Western San Fernando Valley Canyons and Tributary Streams. (Chair)
- Kear, Jordan, 2005. Hydrogeology of the Ojai Groundwater Basin: Storativity and Confinement, Ventura County, California. (Chair)
- McCord, Brian, 2001. Hydrogeochemistry and Isotopic Analyses of the Fractured Volcanic Aquifer System of Mount Shasta, Siskiyou County, California. (Chair)
- Tersibashian, Nuna, 2001. Characterization and Quantification of Non-point Source Water Pollutants Emphasizing Chloride and Nitrate in Simi Valley, Ventura County, California. (Chair)
- Davila, Jose, 1998. Fluid Mechanics of Horizontal Radial Flow in Porous Medium as Applied to Soil Decontamination by Bio-Slurping. (Member)
- Bonds, Christopher, 1998. Reactant Sand Fracking - A Pilot Study of an Innovative In Situ Groundwater Remediation Technology for Fractured Bedrock Aquifers. (Member)
- Schaaf, Joseph, 1998. Hydrogeology of the Tierra Rejada Groundwater Basin, Ventura County, California. (Chair)
- Evensen, James, 1997. Hydrogeology of the Simi Valley Hydrologic Basin, Ventura County, California. (Chair)
- Clasen, Christopher, 1997. Modeling the Influence of Air Sparging on Soil Vapor Extraction. (Member)
- Gossell, Melissa, 1996. Application of Impeller Flowmeter and Discrete Water Sampling Techniques for Improved Groundwater Well Construction. (Chair)
- Larson, Robert, 1995. Stability of Soil on Natural Slopes. (Member)
- Copeland, Jeff, 1992. Hydrogeologic Study of the Upper Water Bearing Zone in the Palos Verdes Landfill, Los Angeles County, California. (Chair)

F. PROJECT SUMMARY

Project Title: Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County, California

Introduction

Water supplies are one of the most vital and necessary of human needs. However, water resources are not always available to meet supply and demands, and, in many cases, are limited to already over-drafted aquifers. Although Ventura County abuts the Pacific Ocean shoreline, the prospect of incorporating saltwater or brackish groundwater into a reverse osmosis desalination project is cost prohibitive to meet long-term water needs. Since approximately 68-percent of local water supplies are derived from groundwater, subsurface supplies are a proven resource. Critical water infrastructure is at risk of failure or collapse in the event of a drought, natural disaster, or terrorist attack. Finding additional water supply should be a high priority for future resource sustainability. This project involves a comprehensive subsurface characterization and investigation of the water-bearing units (aquifers) in a groundwater basin. Such comprehensive studies will not only improve the management of current groundwater resources and water quality, but will provide a means to assess new water sources as additional or emergency supplies during periods of drought or disaster. To prevent future water shortages, water supply within the local basin(s) should be utilized. In summary, it is more cost-effective to use local water resources, than to import limited State Water supplies.

Development of Conservation Prototype

This research project will be implemented in a local community, and will use innovative ideas for increasing applied research toward enhancing water quality and supply resources. For example, a three-dimensional (3-D) model of the hydrostratigraphy will be constructed using ARCVIEW Geographical Information Systems (GIS) computer software. This model will provide not only views of the overall shape and form of the aquifers in this basin, but also allows the evaluation of both horizontal and vertical connectivity (or disconnectivity) between the aquifers. In addition, water quality, geologic and other data types will be incorporated to interpret the hydrogeologic framework of the basin. Characterizing an aquifer is an important first step to understanding groundwater flow and storage, contaminant fate and transport, water quality impairments in the subsurface, and this research will be the first comprehensive study of its kind conducted within this basin. This is a new technological approach, and the results should serve as a significant tool and/or prototype to aid in developing water resource management and the County of Ventura and other decision makers responsible for water supply and resources.

Project Study Area

The South Las Posas Basin (SLPB) underlies the southeastern end of the Las Posas Valley. The SLP Basin is located beneath the majority of the City of Moorpark and extends eastward beneath the extreme northwestern portion of adjacent Simi Valley, in Ventura County, California (Appendix A, Figure 1). The SLPB is one of thirty-two (32) recognized groundwater

basins, and by volume, the ninth largest of the top ten (10) major groundwater basins (by estimated storage capacity) within Ventura County (Appendix A, Figure 2).

The principal water-bearing units include permeable sediments, Epworth Gravels, and Fox and Grimes Canyon aquifers (VCWPD, 2007). The SLPB encompasses an area of approximately 10,560 acres (or 16.5 square miles). One main tributary flows through the basin (Arroyo Simi, lower reach and Arroyo Las Posas, upper reach). The general groundwater flow directions are south to southwest. The main usage of groundwater within the basin is for domestic and agricultural purposes. Current water demands within the basin are from agricultural (at 93.4%) and municipal and industrial (at 6.6%) uses (Calleguas MWD, 2007). The Metropolitan Water District of Southern California (MWDSC) supplies water to Calleguas Municipal Water District as the wholesale entity via the State Water Project for basin water supply needs. Calleguas, in turn, delivers water to numerous retail water purveyors within Ventura County, including the cities of Moorpark, Simi Valley, Camarillo, Port Hueneme, Thousand Oaks, and Oxnard.

Environmental Significance

The groundwater flow within the SLPB is controlled by the complex geology of the area. An elongated synclinal fold-fault structure is present (VCWPD, 2007) and forms the northern boundary of the basin. In addition, the hydrology and subsurface water flow is dominated by surface flow, percolation, soil permeability, and fold location/orientation (VCWPD, 2007). In the past 20 years, groundwater levels have increased within the basin due to continuous discharges into the Arroyo from local wastewater treatment plants. Since reaching fill capacity, this basin has been spilling westward into the adjacent East Las Posas Basin primarily via constant underflows and continuous surface water flows in the Arroyo. Over the last 20 years, this topping off of the aquifers has caused the East Las Posas groundwater basin to fill in the southerly portion. This relatively recent recharge has also caused a notable and significant degradation in the groundwater quality of the SLPB.

Although the total theoretical water storage capacity within the SLPB has been estimated at 1,252,000 acre-feet (AF) (DWR Technical Information Record, Volume II, July 1975), this number is probably a very high estimate at best. Earlier reports indicated a more realistic figure of 688,000 AF (DWR Bulletin 12, 1953). Based upon an average specific yield value of 9.4% for all SLPB aquifers combined (VCWPA), a more realistic estimate of 117,600 AF of potential recoverable groundwater, however should be considered as the benchmark of basin volume. Currently, the water storage within the SLPB is at approximately 68,000 AF. As the population increases within the basin, so does the demand for water. Historically, within the SLPB, row crops have dominated the agricultural arena. However, future population growth is driving the need for alternative agricultural methods such as more water-intensive greenhouses. Greenhouses require more water; therefore, this process increases the strain on water resources within the basin.

Proposed Work

California State University Northridge, in partnership with the Calleguas Municipal Water District, is applying for funding through the Metropolitan Water District of Southern California to further characterize the SLPB by conducting additional groundwater sampling

within the basin. Currently, cleaning up the SLPB groundwater is a high priority for the Fox Canyon Groundwater Management Agency (FCGMA is the agency with groundwater oversight in the Las Posas Basins) as well as other local water agencies (e.g., Calleguas MWD and Ventura County Water Works District #1). Any attempt to solve this ongoing problem will need a rapid solution to prevent further water quality degradation (FCGMA Groundwater Management Plan, 2007). In addition, Ventura County Waterworks Districts #1 (Moorpark) and #19 (Somis) are working with Calleguas MWD to design and fund a pilot desalter plant project in the SLPB. This project would include the extraction and cleaning of saline groundwater (out of the shallow aquifer), to be blended with low-chloride water and/or desalinated or imported water before delivery to customers (Calleguas MWD, 2007). The potential effectiveness of this particular strategy can be evaluated by the following criteria: 1) reduce the overall salts in the SLPB; and 2) draw down the shallow groundwater to create space for recharge of better quality rain water recharge (FCGMA, 2007). In addition, Calleguas Creek Watershed has a robust monitoring program underway at numerous receiving (surface) water sites throughout the Watershed (Appendix A, Figure 3). Five of the 15 sites are located along the Arroyo Simi (which flows through the SLPB). The remaining 10 sites are outside the study area and beyond the scope of this project.

The proposed effort involves adding one (possibly two) groundwater sampling collection events (during 2008) at pre-determined strategic locations. Primarily, the sample locations will focus on the basin boundaries between the East Las Posas and SLP Basins (Appendix A, Figure 1). Figure 4 (Appendix A) shows the previous 4 wells sampled (in 2007) as well as various other locations that will be selected from for future groundwater sampling events. Only four out of approximately 18 wells within the basin were sampled in 2007, due to limited resources including cost, time, and staff availability. It is hoped that this proposed project effort will serve as a cost-effective investment for better management of water resources of the SLPB. Furthermore, the proposed effort would bridge the gap between surface water and groundwater quality. At present, only basic water samples (e.g., pH, conductivity, and selected general minerals) are collected and analyzed on a yearly basis by County or water district personnel. This proposal includes adding the following groundwater analyses for a more comprehensive SLPB water quality monitoring evaluation and review:

- General Minerals
- CCR Title 22 Volatile Organic Compounds (EPA 502.2)

The SLPB is primarily recharged with groundwater recharge and discharge water from the Simi Valley Wastewater Treatment Plant. The dewatering of highly mineralized groundwater from the western portion of the Simi Valley Basin, and urban runoff water into the Arroyo Simi have been mainstays of water influx sources to the SLPB for at least the last 25 years. As a result, the dynamics of the SLPB have changed dramatically. The groundwater levels are now so high in the SLPB that they have been consistently entering into the East Las Posas Basin for the past several years. The aforementioned groundwater has a Total Dissolved Solids (TDS) value averaging about 2,000 mg/l, whereas the TDS of Arroyo's waters average around 1,000 mg/l. These water quality impairments have reduced the utilization of the Basin's water resources.

Project Tasks/Schedule

The project involves a list of tasks that are necessary to thoroughly characterize the basin. For example, a comprehensive analysis of selected aquifer characteristics such as hydraulic conductivity, hydrogeology and hydrology of the SLPB will be conducted. To characterize the basin, a three-dimensional (3-D) model in ARCVIEW Geographic Information System (GIS) will be constructed. This computer-generated model will be similar to a conceptual site model (CSM), visualize the hydrostratigraphic units, and spatial and temporal trends of other hydrologic and hydrogeologic data. Furthermore, this modeling software will be used to accurately represent the water-bearing units that comprise the hydrogeologic framework for this basin. In addition, the model will evaluate the overall shape and degree of hydraulic connectivity (or disconnectivity) between the aquifers by interpreting the geologic structures. The model will also be used to visualize spatial and temporal variations of water quality impairments within the basin. Lastly, this study will attempt to delineate and document a suspected northeast-southwest trending unnamed fault that cuts the basin by analyzing lithological and groundwater data. The project will also involve a comprehensive hydrologic budget analysis to completely analyze current and projected groundwater supplies.

Key Schedule/Milestones/Deliverables

Project Task ^a	Fall 07	Winter 08	Spring 08	Summer 08
Literature Review and Data Collection				
Groundwater Sampling and Data Analysis				
GIS and Hydrostratigraphy Modeling				
Report Writing and Finalization				
Public Outreach: Groundwater Conference Poster				

a = Tasks and dates may be modified in the future to fit research and project objectives.

Outcomes/Water Supply Benefits

This research project has numerous benefits on both a local and regional scale. For example, analyzing the hydrostratigraphy within a groundwater basin assists in identifying permeable zones and confining units that provide knowledge of the hydrogeologic framework. This new knowledge facilitates source-water protection and improved storage and recovery. In addition, this model will characterize the subsurface and provide a better understanding of the groundwater basin including availability of water resources and water quality. Numerous local agencies will benefit from this study including but not limited to the County of Ventura Watershed Protection District, United Water Conservation District, Fox Canyon Groundwater Management Agency, Calleguas Municipal Water District, and the Metropolitan Water District of Southern California. Subsurface modeling is important in geosciences for data collection, organization, presentation, understanding, and distribution of geologic and hydrogeologic data. Geographic Information System (GIS) software uses the commonality between multiple layers to search their relationships. Spatial analysis in GIS is used to uncover associations between data sets that are otherwise unknown.

The Fox Canyon Groundwater Management Agency (FCGMA) is the primary agency responsible for oversight of the SLPB. The prime objectives of the agency are to preserve

groundwater sources for agricultural, municipal and industrial uses in the best interest of the public and for the common benefit of all water users (FCGMA, 2007). The FCGMA Groundwater Management Plan (May 2007) discusses a number of aspects and future groundwater management strategies. In the SLPB, the current strategy includes the South Las Posas Pump/Treat idea, which is a plan to pump poor quality shallow groundwater and then blend/treat the groundwater to suitable quality necessary to meet customer demands. This research will not only assist the end user(s) to visualize the hydrostratigraphy, water quality and other hydrogeologic parameters within the subsurface, but more importantly, to continue to preserve and protect the groundwater as a valuable resource and commodity within the basin. No comprehensive study of the SLPB in Ventura County has ever been conducted. Such comprehensive studies will not only improve the management of groundwater resources and water quality, but will provide a means to assess any possible new water sources as additional or emergency water supplies during periods of drought or disaster when conventional wells and imported sources are not readily available.

Team Member Roles/Responsibilities

Individual	Affiliation	Responsibilities
Dr. M. Ali Tabidian (Faculty Project Manager)	CSUN Department of Geological Sciences	Overall project direction and technical approach; budget and personnel management; and data quality assurance
Ms. Kenda L. Neil (Student Project Manager)	CSUN Graduate Student (Geology Department)	Assist with technical approach; budget and personnel management; report writing; and data quality assurance
Mrs. Colleen Garcia (Research Assistant)	CSUN Graduate Student (Geology Department)	Assist with any field efforts; data quality assurance; and assist with report writing
Mr. David Panaro (Technical Expert)	VCWPD (Groundwater Section)	Provide technical data, support and oversight; and data quality assurance

Team Member Experience/Technical Capabilities

Individual	Experience/Technical Capabilities
<p>Dr. M. Ali Tabidian (Faculty Project Manager)</p>	<ul style="list-style-type: none"> • 20 plus years experience in the field of hydrogeology and groundwater quality • Areas of Interest: Stream/Aquifer Hydraulics, Water Quality (Surface and Groundwater), and Application of Groundwater Models (Numerical and Analytical) • Registered Environmental Assessor, California (REA-02816) • Numerous textbook and journal publications (10) on the following topics: environmental geology, groundwater resources, and water quality issues • Professional Consulting: 1) Mountains Restoration Trust (2005 – present); 2) Bridge the Gap and the Santa Susana Field Laboratory Community Working Group (2000-Present); and 3) Law Offices of Paul, Hastings, Janofsky & Walker LLP, San Francisco (1997-1998) • Previous proposals funded: 1) Funding Agency – Mountains Restoration Trust (2005); Title: Upper Los Angeles River Area Assessment Project: ULARA; 2) Funding Agency – Santa Susana Field Laboratory, A Project of Tides Center, San Francisco (2004); Title: Perchlorate Occurrence /Distribution, Surface Water/Groundwater Interactions and Groundwater Use in Simi Valley, Ventura County, California. • Research in Progress: 1) Hydrologic and hydrogeologic investigation of the upper portions of local canyons west of the 405 Freeway in the western San Fernando Valley.
<p>Ms. Kenda L. Neil (Student Project Manager)</p>	<ul style="list-style-type: none"> • 10 plus years experience (education and professional combined) in the field of hydrogeology, groundwater and soil remediation • Current Professional Employment: NAVFAC Engineering Service Center, Port Hueneme, CA, Hydrologist (2003 – present) • Specializations: Hydrogeologic investigations, groundwater quality analyses, tracer hydrology and isotope geochemistry studies, subsurface geologic mapping, aquifer characterization • M.S. Geology Degree (in progress) candidate, CSU Northridge; courses taken: hydrogeochemistry, hydrogeology, groundwater modeling, isotope geochemistry, structural geology, environmental geology, and advanced microstructural geology • B.S. Environmental Science and Minor in Geology; UC Santa Barbara (1999) • Computer software knowledge: ArcGIS, USGS MODFLOW, Adobe Illustrator and Photoshop, Visio, Microsoft Office (entire suite – Access, Excel, etc.)
<p>Mrs. Colleen Garcia (Research Assistant)</p>	<ul style="list-style-type: none"> • 10 plus years experience (education and professional combined) in the field of hydrogeology and groundwater quality • M.S. Geology Degree (in progress) candidate, CSUN; courses taken: groundwater modeling, hydrogeology, hydrogeochemistry, GIS • Specializations: Hydrogeologic analysis, hydrogeomorphology, digital mapping, EIR report writing, environmental law, wetland conservation, surface water studies, water resources planning, subsurface geologic mapping, aquifer characterization • Computer software knowledge: AutoCad, ArcGIS (Certified, 2007), USGS MODFLOW, Adobe Illustrator, Microsoft (PC) and Mac trained
<p>Mr. David Panaro (Technical Expert)</p>	<ul style="list-style-type: none"> • 20 plus years experience in the field of groundwater resources, hydrogeology, and geotechnical engineering • Professional Geologist, California (No. 7118) • Numerous publications (12) on the following topics: groundwater resources and groundwater quality (e.g., nitrates, seawater intrusion) • Research interests: Landslides; groundwater basin studies and safe yield determination

G. PROJECT MANAGEMENT TEAM

Our project team consists of California State University, Northridge faculty and students, and Ventura County Watershed Protection District (VCWPD) personnel. Although this project team is relatively small compared to other teams, this team collectively provides a unique set of capabilities, recognized expertise in the development and application of environmental-related projects, and a combined timeframe of 30 plus years experience. VCWPD personnel and CSU Northridge faculty and students have worked collaboratively before on other research projects.

Team members

Dr. M. Ali Tabidian

Department Chair and Professor, of Hydrogeology

Department of Geological Sciences

Title: Faculty Project Manager

18111 Nordhoff Street, Northridge, CA 91330-8266

(818) 677-2536

ali.tabidian@csun.edu

Ms. Kenda L. Neil

Title: Student Project Manager

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(805) 482-8852

enviroluv2@aol.com

Mrs. Colleen Garcia

Title: Research Assistant

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(818) 636-7134

colleengarcia@gmail.com

Mr. David Panaro, P.G.

Title: Technical Expert

County of Ventura – Watershed Protection District, Groundwater Section

800 South Victoria Avenue

Ventura, CA 93009-1610

(805) 654-2327

dave.panaro@ventura.org

References Cited

Fox Canyon Groundwater Management Agency, 2007. *Groundwater Management Plan*, 183 pp.

APPENDIX A – FIGURES

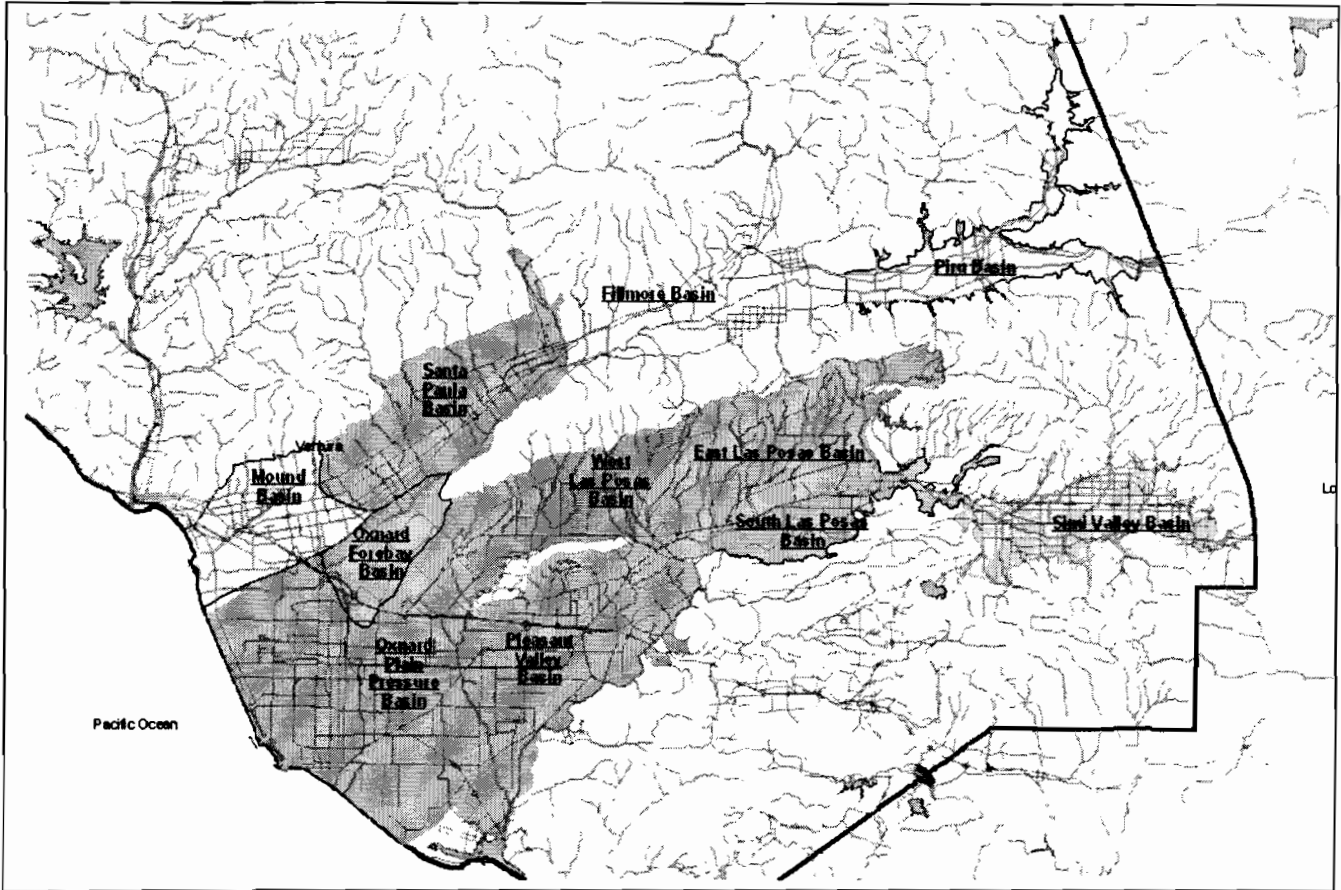


Figure 1. Index map of major groundwater basins (including South Las Posas Basin), Ventura County, California (VCWPD, 2007).

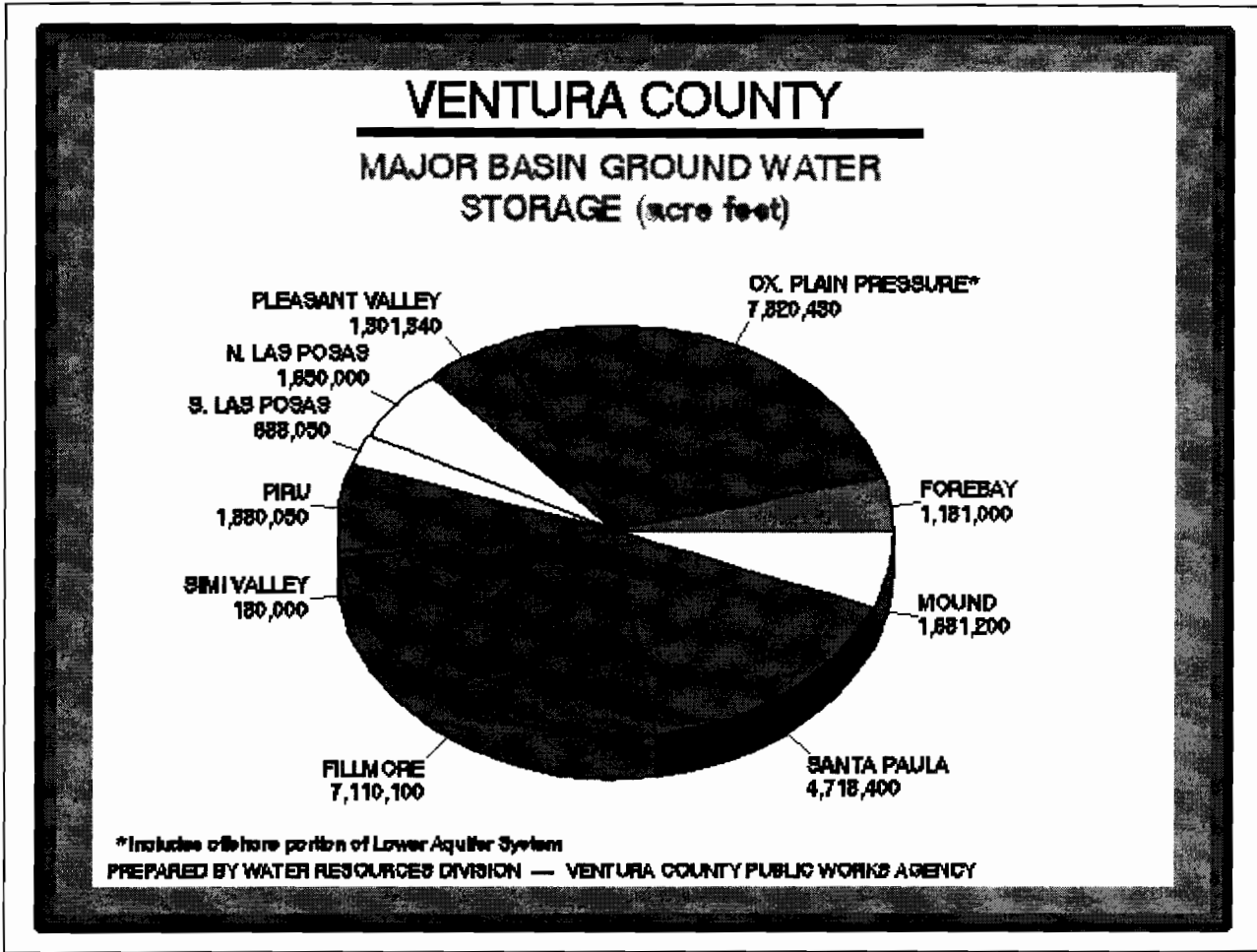


Figure 2. Pie chart represents storage capacity of 10 major groundwater basins, Ventura County, California (furnished by VCWPD, 2007).

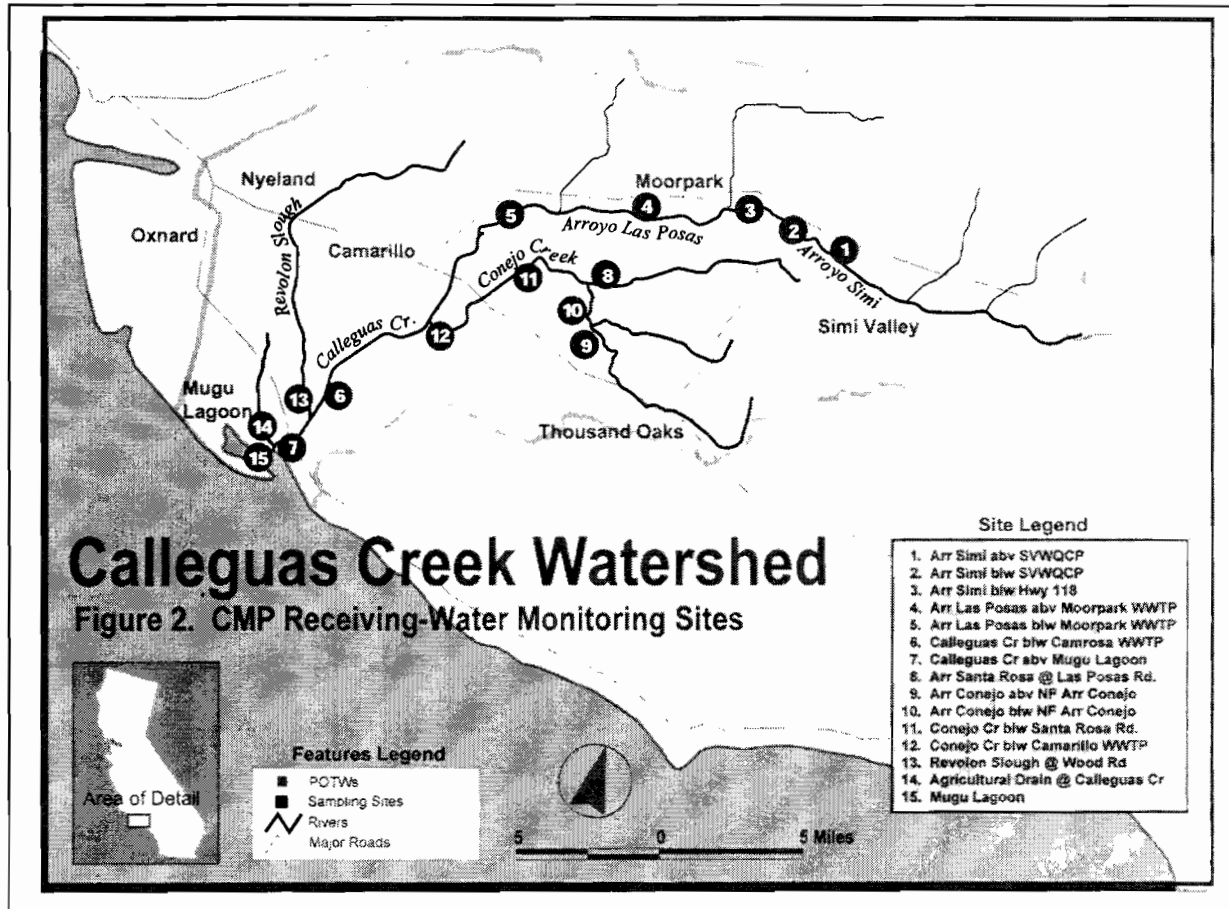


Figure 3. Index map of Calleguas Creek Watershed receiving-water monitoring sites (furnished by Calleguas MWD, 2007).

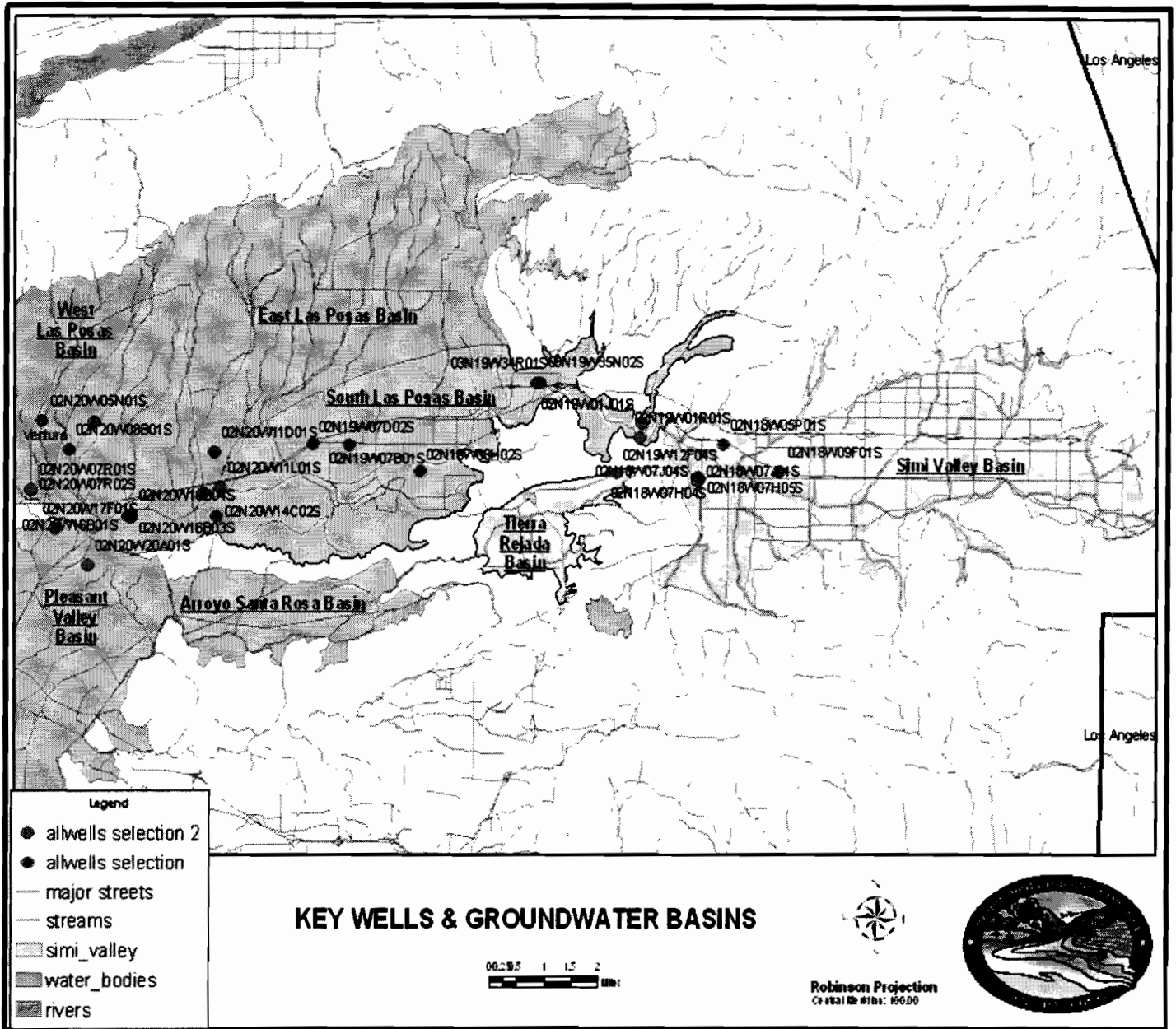


Figure 4. Well location map with past 4 wells (02N19W07B02, 02N19W07D02, 02N19W08H02S, and 02N19W12F04S) that were sampled in 2007 by County of Ventura personnel. Additional wells for future groundwater sampling are also shown. (map furnished by VCWPD, 2007).



H.1.

In order to provide perspective on reasonable grant requests, the respondents are reminded that \$10,000 is the maximum grant amount allowable. Budget must reflect all anticipated expenses.

DESCRIPTION	AMOUNT	NOTES
GRANT FUNDS REQUESTED FROM MWD	\$ 10,000	SEE H.2 ATTACHED BUDGET (LINE ITEMS)
ADDITIONAL SOURCE OF FUNDS CSUN GEOLOGY DEPT SCHOLARSHIP	\$ 1,000	DATE ISSUED (if applicable): NOT ISSUED YET
ADDITIONAL SOURCE OF FUNDS CALLEGUAS MWD.	\$ 5,000	DATE ISSUED (if applicable): NOT ISSUED YET
PROJECT TOTAL	\$ 16,000	





H.2.

LINE ITEM	AMOUNT	DESCRIPTION
STIPENDS		
LAB FEES		
OFFICE SUPPLIES		
CONSULTANT		
OVERHEAD FEE		
CONFERENCE REGISTRATION		
EQUIPMENT		
OTHER (Define)		
TOTAL		

Important Financial Criteria:

Each applicant must demonstrate how they will provide the **minimum match of 25 percent** of the total cost of the proposal. The **matching funds** can be categorized as: (1) Grants, (2) In-kind contributions, (3) Volunteer time and (4) Donated equipment. The **money cannot be used for** travel and related expenses. Where applicable, the **college overhead fee may not exceed 10%** of the proposed budget. Where applicable, the **stipends may not exceed 50%** of the proposed budget.

H.2. – RESEARCH GRANT PROPOSED LINE-ITEM BUDGET

Note: This document replaces H.2. in the Grant Application

Organization Name: California State University Northridge, Department of Geological Sciences

Proposal Title: Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County, California

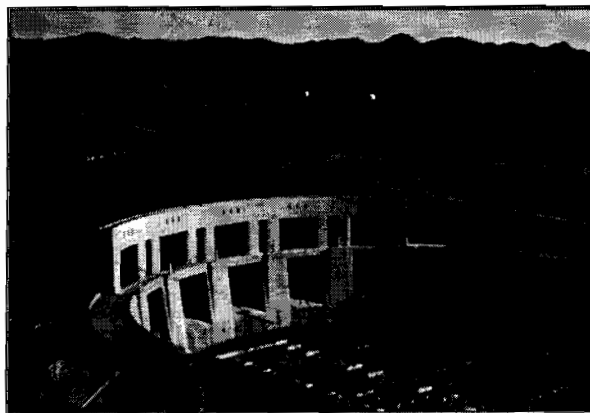
LINE ITEM	AMOUNT	DESCRIPTION
1. STIPENDS	N/A	N/A
2a. LAB FEES Groundwater Sampling Analyses (General Minerals)	\$3240	\$162/sample; 10 samples per event x 2 events
2b. LAB FEES Groundwater Sampling Analyses (Title 22 Volatile Organics – Method 502.2)	\$4700	\$235/sample; 10 samples per event x 2 events
3. OFFICE SUPPLIES	\$400	Publication costs for final report (e.g., binding, printing)
4. CONSULTANT	N/A	N/A
5. OVERHEAD FEE	N/A	N/A
6. CONFERENCE REGISTRATION	\$450	Public outreach – Poser presentation at a 2008 NGWA Groundwater Conference
7a. EQUIPMENT – Rental/In-Kind Peristaltic Pump	\$460	Amount is based on rental fee (1 month). Equipment furnished by NFESC, Port Hueneme, CA
7b. EQUIPMENT – Water Level Meter	\$250	See 7a description
7c. EQUIPMENT – Flow Through Meter	\$150	See 7a description
8a. OTHER - Consumables	\$350	Groundwater sampling supplies: gloves, bailers, etc.
9. TOTAL	\$10000	



I. SIGNATURE BLOCK

	NAME	SIGNATURE	DATE
Faculty Project Manager	M. Ali Tabidian	M. Ali Tabidian	12/11/07
Student Project Manager	KEWDA NEIL	Kenda Neil	12/7/07
Member Agency Representative ²	DON KENDALL GENERAL MANAGER CALLEGUAS MWD	Don Kendall	Dec 7 th , 2007

Note: On a voluntary basis, the Member Agency, has agreed to serve as the local partner for the college / university. As a non-fiscal partner, the Member Agency is not required to provide financial assistance for the Project. At their discretion and strictly on an as-needed basis, the Member Agency will provide in-kind resources and technical assistance for the college / university, pending availability of requested resources or personnel (subject matter experts). *Excerpt from MWD-College Funding Agreement*



² For a list of local water agencies (member agencies), log onto www.mwdh2o.com or you may contact the Project Coordinator, Benita Lynn Horn at waterforum@mwdh2o.com or (888) 42-WATER.



METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Thank you to the following program partners, who generously provide fiscal, technical or in-kind resources to this project:

United States Bureau of Reclamation

Sanitation Districts of Los Angeles County

American Society of Civil Engineers

Friends of the United Nations

Water for People

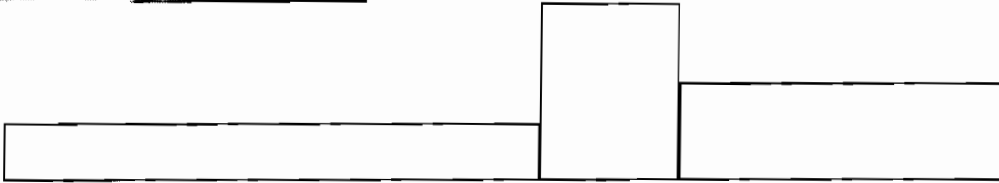
Family of Southern California Water Agencies

www.usbr.gov, www.water4people.org, www.lacsd.gov,

www.bewaterwise.com, www.asce.org, and www.fotun.org



SANITATION DISTRICTS OF LOS ANGELES COUNTY



Ms. Kenda L. Neil
1491 Mandalay Court
Camarillo, CA 93010

December 5, 2007

Dr. Donald Kendall, Ph.D., P.E.
General Manager
Calleguas Municipal Water District
2100 Olsen Road
Thousand Oaks, CA 91360-6800

SUBJECT: Partnership request for the following research project: "Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County, California"

Dear Dr. Kendall:

Please accept this letter and accompanying information as my request for a partnership between my research team, CSU Northridge (Department of Geological Sciences), and Calleguas Municipal Water District. On October 12, 2007, I (along with my advisor, Dr. M. Ali Tabidian) attended the Southern California World Water Forum, sponsored by Metropolitan Water District of Southern California. The purpose of the forum was to invite colleges and universities who attended and inform them of the Southern California World Water Forum Innovative Conservation Research and Technology Grant Program (SCWWFGP). Currently, I am preparing a research grant proposal to submit to Metropolitan Water District of Southern California, on or before December 14, 2007. This proposal will be submitted on behalf of CSU Northridge, Department of Geological Sciences, and will follow all administrative and grant development university protocols.

One of the grant proposal requirements includes forming partnerships with local water agencies or other environmental organizations. This is not a solicitation for financial support. The only requirement would be for Calleguas Municipal Water District to support my research with either technical expertise or other resources.

We would like to thank you for taking the time to review this request for partnership. My project summary is included with this letter. Please provide a response (either in support or not) on letterhead and return to me at your earliest convenience. Please do not hesitate to call if you have any questions regarding the aforementioned information. Thank you for your time and consideration.

Respectfully submitted,



Ms. Kenda Neil
CSU Northridge
Graduate Candidate (M.S. in Geology)

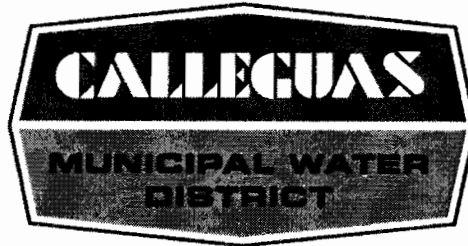
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December 6th, 2007

Dr. Ali M. Tabidian
CSU Northridge
18111 Nordhoff Street
Northridge, CA 91330

Dear Dr. Tabidian:

Under the terms of the Southern California Metropolitan Water District's World Water Forum College Grant Request for Proposals for the calendar year 2008, it is the intent of Calleguas Municipal Water District (MWD) to support the research project "Analysis of Selected Aquifer Characteristics and Hydrostratigraphy of the South Las Posas Basin, Ventura County" proposed by Ms. Kenda L. Neil. As you are aware, Calleguas and Metropolitan are storing State Project Water in the adjacent North Las Posas Basin. As such, we would be interested in learning more about how potential changes in groundwater pumping in the South Las Posas will influence the stored water supply.

If the proposed project is approved for University funding by the Metropolitan Water District, and a mutually acceptable research agreement is negotiated and completed, Calleguas Municipal Water District intends to fully support Ms. Neil's research project. We realize that funding is not requested at this time, however, we would like to join the University as a partner in this research project.

I attest that the information provided to Calleguas MWD by the project proponents is accurate and that I have the authority of Calleguas Municipal Water District to make the commitments, herein, and further, that I have read the proposal and determined that it does not include any commitment to provide financial support, only for research and technical support. However, Calleguas may be interested in participating financially as well.

Good luck with your proposal submittal. I look forward to speaking with you in the near future to discuss any additional details regarding our partnership.

Very truly yours,

A handwritten signature in black ink, appearing to read "Donald R. Kendall", written over a horizontal line.

Donald R. Kendall
General Manager