

# ASSOCIATION OF ENGINEERING GEOLOGISTS

Southern California Section
"Serving Professionals in Engineering, Environmental,
and Groundwater Geology Since 1957"

# NEWSLETTER - MARCH 2002

# MONTHLY DINNER MEETING

Date:

Wednesday, March 20, 2002

Location: Time: Stevens Steakhouse, 5332 Stevens Place, Commerce, CA 5:30 p.m. - Social Hour; 7:00 p.m. - Dinner; - 8:00 p.m.

Presentation

Reservations:

Call (949) 253-5924 ext. 564 by 5:00 p.m., Monday,

March 18, 2002

Cost:

\$25.00 per person with advanced reservations, \$30.00 at

the door, and \$10.00 for students w/ valid I.D., "No-

shows" will be billed \$10.00

# JOINT MEETING WITH ASCE GEOTECHNICAL GROUP

**SPEAKER:** 

Edwin L. Harp

TITLE:

Landslide Hazards Triggered by the January and February

Earthquakes in El Salvador

**ABSTRACT:** The magnitude 7.6 earthquake of 13 January 2001 in El Salvador triggered thousands of landslides in scattered pockets of high concentration within the southern half of the country. Most of the landslides were falls and slides of rock and soil within young volcanic pyroclastic deposits. Exceptions to this were the slump/debris flow of approximately 500,000 m³ that buried parts of the community of Las Colinas resulting in almost 500 fatalities, and the massive block slide that buried the Pan American highway near San Vicente. Geologic units most affected by landslides include the Balsamo Formation and the younger pyroclastic units that overly this formation. The areas most affected by landslides include the Cordillero Balsamo region west and south of San Salvador, areas around Lago de Ilopango and Lago Coatepeque, slopes on the flanks of volcanoes in the southern part of the country (particularly Usulután Volcano), and several slopes around San Salvador proper.

On February 13, 2001, a magnitude 6.5 earthquake occurred about 40 km east-southeast of the capital city of San Salvador in central El Salvador and triggered thousands of landslides in the area east of Lago de Ilopango. The landslides were concentrated in a 2,500-km² area and were particularly abundant in areas underlain by thick deposits of poorly consolidated, late Pleistocene and Holocene rhyolitic tephras that were erupted from Ilopango caldera. Drainages in the tephra deposits are deeply incised, and steep valley walls failed during the strong shaking. Many drainages were clogged with landslide debris that locally buried the adjacent valley floors. (cont.)

# **OFFICERS**

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et

In addition to thousands of shallow failures, two very large landslides blocked the Río El Desagüe and the Río Jiboa. The Río El Desagüe landslide has an estimated volume of 1.5 million m³, and the Río Jiboa landslide has an estimated volume of 12 million m³. Field studies indicated that catastrophic draining of the Río Jiboa lake posed a serious hazard and warranted immediate action.

Two major slope failures on the northern side of Volcán San Vicente occurred in the upper reaches of Quebrada Del Muerto and the Quebrada El Blanco. The landslide debris in the Quebrada Del Muerto consisted of large, well-lithified andesite blocks, whereas the debris in the Quebrada El Blanco consisted of poorly consolidated pyroclastic sediment. The rock-slide deposit in Quebrada Del Muerto was deemed unlikely to remobilize during the rainy season; whereas, the sandy and silty landslide debris in the channel of Quebrada El Blanco was judged to be susceptible to remobilization as debris flows that could extend into populated areas on the lower slopes of the volcano.

Around the northern and eastern shore of Lago de Ilopango, earthquake-induced liquefaction and lateral-spreading landslides caused local damage to homes and other structures; this damage was most prevalent in the village of San Agustín. San Agustín was also threatened by floods because of its location on the alluvial fan of the Quebrada El Chaguite drainage basin, which contained hundreds of landslides that have choked numerous small channels with pyroclastic landslide debris.

BIO: Ed Harp earned his M.S. degree at Montana State in geology and a Ph. D. at University of Utah also in geology. Dr. Harp has worked at the USGS his entire career studying both earthquake- and climate-induced landslides. His early works focused on process studies that included instrumentation of landslides, post-earthquake and post-storm studies of landslide occurrence both domestic and international, and in-situ experiments in landslide initiation. Recent consists of development of state-of-the-art landslide hazard analysis and mapping in a GIS format. Real-time monitoring of landslides and emergency response (three years on Hurricane Mitch landslide effects in Honduras) to landslide events have occupied about 2/3 of Dr. Harp's research, with the remainder devoted to developing a landslide hazard map for the city of Seattle.

Steven's Steak House, 5332 Stevens Place, City of Commerce, T.G. 675 G-3, (213) 723-9856

# **CHAIR'S COLUMN**

# **By David Seymour**

Our February 2002 joint meeting with the SCGS was great, with a little more than 80 attendees. Thanks again to **Jerome DeGraff** for a fabulous presentation and also to **Mike Hart** for inviting Jerry. Our March meeting should prove to be just as informative with **Ed Harp** as our speaker. This is our annual joint meeting with the ASCE Geotechnical Group. Don't miss out on this opportunity to catch up with your engineering colleagues.

# Past Chairmen Night

As part of our June 2002 Past Chairmen Night, I would like to compile a list of all our past Chairs. All past Chairs please let me know what year you held office either via <u>e-mail</u> (seymourgeo@hotmail.com) or voicemail (714-549-8921).

#### Raffle Items

Our February raffle was a huge success thanks to the generous contributions of **Larry Cann Paul Davis,** and **Buzz Spellman** This raffle provides a great opportunity for our younger members to build their professional libraries with oftentimes classic and out of print publications. Don't forget to buy your tickets at the next meeting, and please don't hesitate to contribute raffle items as well.

## **Legislative News**

Joe Cota, our Legislative Chair, along with **Hugh** Robertson and **Buzz Spellman** have been busy reviewing several bills recently identified by our lobbyist, Judy Wolen. An update on legislative affairs will be provided in upcoming newsletters, as much of the evaluation is still in progress.

#### **Electronic Newsletter and Website**

In order to set up and maintain a website, etc., we **MUST** reduce mailing costs. Due to the poor response to our on-going e-issue campaign [Ye Luddites! ed.], a more aggressive approach is warranted. Starting this

month, everyone that has provided an email address to National will receive both the paper and e-issue versions of the newsletter. In April, those of you that received both versions will then receive the e-issue only, unless paper is requested his will be the only written (paper) notice. For the others, please request the electronic version of the newsletter. The e-issue is in Adobe Acrobat Reader, identical in format, printer friendly, with software free at <a href="https://www.adobe.com">www.adobe.com</a> All you have to do is send Jeff Kofoedan e-mail.

## 2007 Annual Meeting

Many thanks to **Jeff Keaton**who has volunteered to cochair the 2007 Annual Meeting. Jeff got me so excited about it, I agreed to co-chair as well. If you'd like to volunteer, please contact Jeff or I.

# MEMBERSHIP RENEWAL

If you are unsure about your membership status, please contact AEG Headquarters (www.aegweb.org), **Jeff Kofoed**, Secretary, or me. We are currently looking for a new Membership Chair. Please contact David Seymour if you wish to volunteer.

## YEAR 2002 CONTRIBUTORS NEEDED

Contributions from corporations and individual members for 2002 are greatly appreciated. Contributors will be listed in our newsletter throughout the year and can post their logo or business card in the newsletter if so desired. Please mail contributions made out to **AEG** to our section chair, David Seymour, 26276 Buscador, Mission Viejo, CA 92962.

## YEAR 2002 MEETING SCHEDULE

<u>Date</u>	<u>Speaker</u>	<u>Location</u>			
March	Ed Harp	Steven's			
w/ ASCE	·	Steakhouse			
April	TBA	Steven's			
		Steakhouse			
May	TBA	TBA			
June	TBA	TBA			
(Past Chairmen					
Night)					
July	NO MEETING				
August	NO MEETING				
Sept.	TBA	TBA			
October	TBA	TBA			
November	TBA	TBA			
w/ IGS					
December	NO MEETING				

# AEG SOCAL SECTION COMMITTEE CHAIRS

MEMBERSHIP – OPEN
LEGISLATIVE AND REGULATORY AFFAIRS - <u>Joe</u>
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(djames@leightongeo.com)
FIELD TRIPS - OPEN
SHORT COURSES - Kerry Cato (909) 506-9688
EDUCATION - Ali Tabidian (818) 677-2536
EDITOR – Jeff Kofoed

# FIELDTRIP AND MEMBERSHIP CHAIRS NEEDED!

We are still looking to fill both chair positions. If you would like to volunteer, or have any fieldtrip ideas, please contact <u>David Seymour</u>.

# **2002 Meetings and Field Trips**

Engineering Geology for Timber Harvesting Seminars **AEG** San Francisco Section & California Geological Survey

Santa Rosa – April 12 & 13, 2002 Eureka – April 26 & 27, 2002 Sacramento – May 17 & 18, 2002

Registration Fee - \$95 (\$105 after March 15) Contact Jason Preece (925)-296-8055 or preeceje@cdm.com

**AEG** - AIPG Annual Meeting September 23 - 29, Reno, Nevada see <u>www.aegweb.org</u>

**GSA** Cordilleran Section Meeting May 13-15, Corvallis, Oregon see <a href="http://terra.qeo.orst.edu/users/gsa2002">http://terra.qeo.orst.edu/users/gsa2002</a>

Friends of the Pleistocene Pacific Cell Field Trip September 20 - 22, Central Nevada contact John Caskey (caskey@sfsu.edu)

# ADVERTISING RATES IN AEG SOCAL SECTION NEWSLETTER

Contact your section Chairman for rates.

# Ideas Sought for Symposium on the Future of Engineering Geology at AEG-AIPG 2002, Reno, Nevada.

We will have a special symposium at the Reno meeting, titled "Visioning the Future of Engineering Geology: Sustainability and Stewardship." Why this symposium? Yogi Berra said it best: **BE VERY CAREFUL –IF YOU DON'T KNOW WHERE YOU ARE GOING...YOU MIGHT NOT GET THERE.** 

This symposium will explore ways to add value to engineering geology practice in the years to come, and develop strategies to overcome conditions that threaten the viability of the profession.

Engineering Geology has been evolving for well over a century. Where is Engineering Geology headed in the 21<sup>st</sup> century – or even the next twenty years? Where *should* it be going? What can be done – and by whom or by what organizations – to help Engineering Geology fulfill its potential as the prime geologic specialty that directly impacts human health and safety, and supplies solutions to geologically-based engineering, environmental, and public safety problems?

This symposium provides an opportunity for individuals who believe in the value of engineering geology, and the professional organizations that are responsible for its future, to develop a shared and coordinated strategy to keep engineering geology alive and growing, and to keep engineering geologists engaged in using their special expertise to protect the public health, safety, and welfare.

Topics under development are:

- Site characterization as the *raison d'être* for engineering geology
- The role of statutory licensure in the practice and future of engineering geology, and the role of engineering geology in the future of statutory licensure
- Sunrise to sunset: antidotes for poison pills
- The semi-independent licensure board: a solution to financial and legislative headaches?
- The role and feasibility of academic department program accreditation in engineering geology
- Engineering geology in building and grading codes, regulations, laws, and practice guidelines
- The evolution and future of the ASBOG geology licensure examination and state engineering geology certification examinations
- Engineering geology professional associations: are their missions incomplete and their visions clouded?
- Closing workshop: creating the future of engineering geology

As the convener of this symposium, I would like input from geologists who care about our profession and its future. Send me your ideas. What is important to you? What blunders have been made (or blinders worn) in guiding the profession in the past? What are the risks for the future? How do you feel about the topics selected thus far? Any suggestions for speakers and more topics? Thanks!

Robert E. Tepel 767 Lemonwood Ct. San Jose CA 95120-2220 voice 408-997-3437 facsimile 408-997-6932 bobtepel@pacbell.net

## **CCGO ANNOUNCEMENTS**

Dr. Bob Watters, University of Nevada, Reno will present his talk "**Realism in volcano hazard zonation: Does geo-engineering help provide more accurate assessment** April 9, at Steven's Steak House. Funds raised will benefit the CCGO.

Abstract: Significant rock strength reductions, as a result of weathering processes, often result in slope instability. The strength reduction caused by hydrothermal alteration is not well documented or understood. Economic geologists have long recognized the relationship between alteration and mineralization, but only recently has this relationship been correlated with rock strength and applied to surface and underground mining or construction excavations. **Extrapolating the concepts of engineering slope design to the volcano environment** power potential for improving assessments of the hazarch sector collapse and subsequent catastrophic rock avalanche or lahar.

Bio: Dr. Bob Watters obtained his Ph.D. in Engineering Geology from Imperial College. He is a Professionally Registered Engineer in both geological and civil engineering and was the AEG-GSA Richard H. Jahns Distinguished Lecturer for 2000-2001.

Date:

Tuesday, April 9, 2002

Location:

Stevens Steak House, 5332 Stevens Place, Commerce, CA (Off the 5 freeway at Atlantic Boulevard) (323) 723-9856

Time:

Social 5:30 p.m.; Dinner and announcements 6:45 p.m.;

Presentation 8:00 p.m.

**Reservations:** 

Call (949) 253-5924 ext. 564 by 5:00 p.m., Friday, April 5.

Cost:

\$30 per person with advance reservations, \$35 at the door, and

\$15 for students with valid I.D. "No-shows" will be billed \$10.00.

**Exhibits:** 

CCGO member organizations and member businesses are invited to set up

display tables to publicize their activities. Contact Betsy Mathieson, <a href="mathieson@exponent.com">emathieson@exponent.com</a> March 22 to make exhibit arrangements.

http://www.ccgo.org

### **ICBO**

The International (Building) Code Council has published CCGO's proposed code change along with numerous other proposed changes. Our proposal will be heard Wednesday, April 10, in Pittsburgh, Pennsylvania, near the end of the Structural hearings. Please remember that this change is only one small step toward beefing up the minimal grading appendix of the International Building Code (which replaces the Uniform Building Code). We hope to submit at least one change each year and to participate in the annual hearings as a means of retaining our hard-won influence in the code development community, as well as bird-dogging other organizations that submit their own proposed changes, some of which typically undermine our own efforts and jeopardize public safety.

The link below includes more proposed changes to the Structural code, General code (both Structural and General often have items dealing with excavations, seismicity, and other pertinent issues), and other changes, as well additional information on the April hearings (click on "ICC Home" at the bottom).

http://www.intlcode.org/codes/2002cycle/2002proposals.html

Betsy Mathieson, Chair, CCGO Code Development Committee email: emathieson@exponent.com

# **EMPLOYMENT OPPORTUNITIES**

#### **LEIGHTON & ASSOCIATES**



Leighton and Associates is a recognized leader in geotechnical engineering throughout Southern California. Meeting and exceeding client expectations for technical quality and cost-effective service, Leighton and Associates has provided innovative construction design solutions and field support for more than 40 years. Our clients know us for creative site planning, solid foundation and earthwork designs, land development, construction management, and construction observation and testing services that stand the test of time.

Challenging opportunities are currently available in Leighton's offices in Irvine, San Diego, Santa Clarita, Westlake, Chino and Temecula offices. We offer generous benefits, interesting project assignments, and teams with whom you will enjoy working.

Accepting applications for various positions at all locations. Please visit our web site for more information. Resume with salary history (in confidence) with a reference to AEG to:

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17781 Cowan, Suite 100
Irvine, CA 92614-6009
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resume@gtginc.com
www.leightongeo.com
No phone calls, please. EOE

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Resumes may be sent to:

Kristen Black P.O Box 1074 San Clemente CA 92674

949) 369-6141, Fax (949) 369-8083

# **US LABORATORIES, INC.**

USLB has immediate openings for Senior, Project and Staff level Geotechnical Engineers and Geologists, with 5 to 10 plus years of experience. We are also looking for experienced Field Technicians and Inspectors with

appropriate certifications. Positions available in our Ventura, Irvine, San Diego and Las Vegas offices (BTC, TELA, TESD, BUENA).

Please submit resumes in confidence:

US Laboratories, Inc. (USLB) 7895 Convoy Court, Suite 18 San Diego, CA 92111 Attn: Human Resources c/o M. O'Brien

E-mail: mobrien@uslaboratories.com

# **RALPH STONE AND COMPANY**

Project/Senior Engineering Geologist

Full or part time CEG opening, min. 5 year varied experience, preferably in Santa Monica Mountains, field investigations, construction/grading observations, report preparation. Excellent opportunity for young or semi-retired individual, West Los Angeles office/location.

Fax resume in confidence to: J. Rowlands (310)-478-7359

# **CDMG**

The California Division of Mines and Geology is seeking an energetic, experienced Manager/Seismologist to oversee a 3 million dollar annual budget and a dedicated team of 26 geologists, seismologists and support staff in Sacramento.

Primary ongoing program efforts include studies active faulting, probabilistic earthquake analysis, earthquake risk and loss analysis, earthquake history, geotechnical review, landslide mapping, and regional geologic mapping. Applied research experience in probabilistic earthquake analysis and earthquake risk and loss analysis is desirable, as is familiarity with HAZUS. Management experience and Professional Registration in California (which may be obtained within the first year of employment) is required. A Ph.D. is desirable. Liberal benefits and a starting salary of \$67,644 await you.

A second position at the same level, also in Sacramento, may also occur by late March, 2002. This second position will manage the CDMG Technical Information and support Program, which oversees publication production and sales, electronic conversion of data, our library and photo collections, and constituent outreach.

Contact Cindy Ballou, Personnel Liaison at (916) 445-1401 or <a href="mailto:cballou@consrv.ca.gov">cballou@consrv.ca.gov</a> for details.

# ASSOCIATION OF ENGINEERING GEOLOGISTS SOUTHERN CALIFORNIA SECTION PUBLICATION ORDER FORM

Ordered By/Shipping Address: Mail Order Form To:

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PHONE		Attention: Dawn James
		Ph.: (818) 707-8320 ext. 224 (Inquiries only, orders must be mailed with payment)

TITLE / DESCRIPTION	PRICE	QTY	TOTAL
Baldwin, J.E. and Sitar, N., 1991, <b>Loma Prieta Earthquake: engineering geologic perspectives,</b> AEG Special Publication No. 1, 170p	\$10.00		
Bishop, K, and Tandy, 1995, <b>Ground Failure during the January 17, 1994 Northridge earthquake</b> Association of Engineering Geologists, Southern California Section, Annual Field Trip Guidebook, November 11, 1995, 106p.	\$20.00		
Shlemon, R.J., 1993, <u>Applications of Soil Stratigraphy to Engineering and Environme</u> ntal <u>Geology</u> . Short Coarse Volume I, 3-ring binder	\$20.00		
Briggs, R.P. and Parke, C.D., 1990, <u>Guide to Field Trips in Pennsylvania, Ohio, and West Virgi</u> n AEG 33 <sup>rd</sup> Annual Meeting, October 1-5	<b>ia</b> \$15.00		
Blake, T. and Larson, R.A., eds. 1991, <u>Engineering geology along the Simi-Santa Rosa fa</u> ult system and adjacent areas. Simi Valley to Camarillo, Ventura County, California, Southern California Section, Annual Field Trip Guidebook, August 24, 1991, v. 1& 2, 383 p. 4 map sheets	\$25.00		
Bucxley, C.L., and Larson, R.A., eds., 1990, <b>Geology and Engineering Geology of the Western Soledad Basin Los Angeles County, Californi a</b> ssociation of Engineering Geologists, Southern California Section, Annual Field Trip Guidebook, November 3, 1990, 185 p., 2 map sheets	\$15.00		
Byer, J.W., <b>1975 <u>Sycamore Canyon Fault, Verdugo Fault, York Boulevard Fault, Raym</u>ond <u>Fault, Sierra Madre Fault Zon</u>e</b>	\$20.00		
Highway and Railroad Slope Maintenance EG, 34th annual meeting, September 29th – October 1th, 1991	\$10.00		
eighton, F.B. <u>Mitigation of geotechnical litigation in Californ</u> iaunson Book Associates, Huntington Beach, California, 274p.	\$20.00		
Sieh, K.E., and Matti, JC., 1992, <b>Earthquake geology, San Andreas fault system, Palm Springs</b> Palmdale AEG, 35 <sup>th</sup> Annual Meeting, Field Trip Guidebook, October 3-4, 1992	<b>to</b> \$1000		
Stout, M.L., ed., 1992, <b>Proceedings of the 35 annual meeting, Association of Engineeri</b> ng Geologists, October 2-9, 1992: 740p.	\$5.00		
Tepel, R, 1995, <b>Professional Licensure for Geologists, an Exploration of Issues</b> ociation of Engineering Geologists Special Publication No. 7, 1995			
Cann, L.R., Cobarrubias, Hollingsworth, B., 1992, Engineering Geology Field Trips Orange County	\$10.00		
Santa Monica Mountains, and MalibuAEG 35 <sup>th</sup> Annual Meeting, Field Trip Guidebook, October 2-9, 1992			

DELIVERY CHARGES ARE \$3.50 FOR THE FIRST BOOK, \$1.00 FOR EACH ADDITIONAL BOOK

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## COURSE SCHEDULE/LOCATION

#### SOUTHERN CALIFORNIA

Monday - May 6, 2002 - Geotechnical Tuesday - May 7, 2002 - Environmental 8:30 a.m. to 5:00 p.m. (Registration begins at 8:00)

# HYATT REGENCY - Long Beach

200 South Pine Avenue Long Beach, CA 90802 (562) 491-1234

#### WHO SHOULD ATTEND

The courses are intended for Geotechnical Engineers and Working with liquefaction, and investigation and Environmental with environmental with environmental with environmental remedial design. These short courses represent 8 hours of Professional Development Hours (PDH's) per day. A certificate will be issued upon completion.

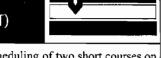
#### PURPOSE

Site characterization is the basic first step for any geotechnical or geo-environmental study. This short course will provide engineers and geologists with the knowledge and background to plan and supervise site investigation and to interpret CPT and SPT data. Emphasis will be given to recent advances and regulatory requirements in the area of liquefaction potential determination and remedial design considerations.

#### A SHORT COURSE ON

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# CONE PENETRATION TESTING (CPT)



Gregg In Situ, Inc. is pleased to announce the scheduling of two short courses on the latest developments in the use of cone penetration testing (CPT) in geotechnical and environmental site investigations.

#### COURSE CONTENT

#### May 6th

# Geotechnical Site Investigation

CPT Data Interpretation
Design Liquefaction
Equipment Testing Procedures
Case Studies
Field Demonstrations

WORKED EXAMPLES AND CASE HISTORIES WILL BE GIVEN TO ILLUSTRATE THE CONCEPTS. A COMPREHENSIVE SET OF NOTES WILL BE PROVIDED TO ASSIST WITH THE COURSE MATERIAL.

#### May 7th

#### Environmental Site Investigation

CPT Data Interpretation
Use of CPT Data in Remediation

Field Screening Tools Sampling Tools

Small Diameter Well

Installations

Injection of Compounds

Case Studies

Field Demonstrations

#### COURSE INSTRUCTORS

Peter Robertson, Ph.D., Peter Robertson, Ph.D., Professor of Geotechnical Engineering, University of Alberta – Dr. Robertson has more than 25 years of professional experience in geotechnical engineering for both private industry and academia. Dr. Robertson, in association with Dr Campenella, developed the widely used Robertson-Campenella Soil Behavior Classification Chart. His recent research has focused on the use of CPT in liquefaction investigation

**David Woeller P.E.**, President, Cone Tec, Inc. — Mr. Woeller is a geotechnical engineer with more than 25 years of professional experience in geotechnical site investigation and foundation design. He has specialized in the development of CPT techniques including the seismic cone, resistivity cone and SPT energy calibration systems for use in foundation design and liquefaction investigations.

Tim Boyd, General Manager, Pitcher Drilling, Inc. - Mr. Boyd is a geotechnical engineer with more than 10 years of professional experience in environmental and geotechnical site investigation. Mr. Boyd has focused on the use of CPT for environmental site investigation and remedial design.

#### \* For additional course details and locations visit our web site at www.greggdrilling.com/seminars

SHORT COURSE REGISTRATION FORM						
	ed by April 26, 2002 to qualify for early registration dicate which seminar you plan to attend:	on fee.	Make checks payab Mail payment with		i <u>q In Situ</u> . registration form to:	
☐ Monday - May 6, 2002 ☐ Tuesday - May 7, 2002 ☐ Both days - May 6 & 7, 2002	\$135.00 early registration - \$200.00 late registrat \$135.00 early registration - \$200.00 late registrat \$185.00 early registration - \$300.00 late registrat	ion	Gregg In Situ 2726 Walnut Ave. Signal Hill, CA 90806 ATTN: Kim Love	PHONE: FAX: E-MAIL: Web Site:	562-427-6899 562-427-3314 klove@greggdrilling.com www.greggdrilling.com	
Registration fee includes seminar, reference materials, continental breakfast, lunch, and break refreshments. Class size is limited; early registration is advised. On-site registration will be on a space available basis.						
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# Douglas E. Moran, Inc

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Do you need reliable results of soil tests that you are not equipped to perform or do not have time to perform? Consider asking *Douglas E. Moran, Inc.* to perform the tests for you. They maintain a laboratory equipped to perform most tests (A.S.T.M., U.B.C., or CALTRANS) and you can always rely on the results. They are willing to perform long-term tests that may be inconvenient to perform in a laboratory that is too busy to allow testing machinery to be tied up for the length of time those tests may require. For you consideration, the following is a list of some of the conventional soil tests that they are equipped to perform.

# Remolded and/or Undisturbed:

Consolidation
Consolidation Plus Time Rate
Direct Shear
Residual Shear
Expansion
Expansion Index
Grain Size (Full Sieve Set)

Hydrometer Analysis
Liquid Limit, Plastic Limit, Shrinkage Limit
Moisture/Density (undisturbed)
Maximum Density
Sand Equivalent
Specific Gravity (soil and rock),
Swell or collapse (remolded air-dry, HUD)

Feel free to call and ask for **Doug Moran** or **Rick Herrera** at (714) 544-2215, Fax (714) 544-7395.

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# ENVIRONMENTAL RECORDS REVIEW Site Assessment Report - Meets Year 2000 ASTM Standards

Our report identifies agency-listed hazardous waste / contaminated sites, solid waste landfills, hazardous waste transfer stations, spills, underground storage tanks and leaking underground fuel tanks in proximity to the subject site. The databases used were obtained from selected government agencies in charge of collecting and keeping such records in accordance with ASTME-1527-00 (Standard Government Records Inquiry for Commercial Real Estate Transactions).

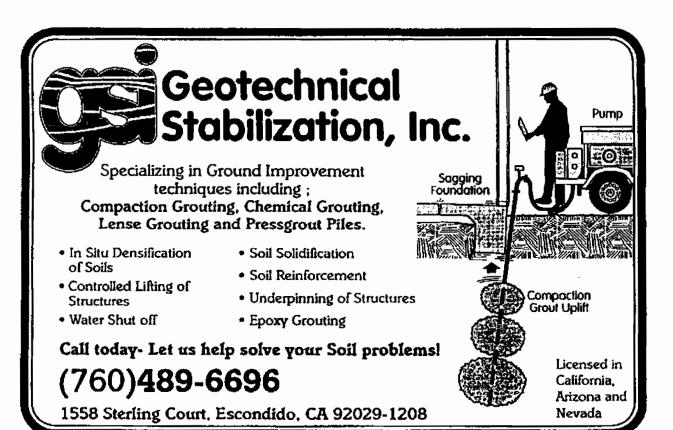
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# Association of Engineering Geologists

Southern California Section





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