Association of Environmental and Engineering Geologists
Inland Empire Chapter, Southern California Section

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"Chromium mobilization from the unsaturated zone"

Wednesday 21-Jan-2009

5:00 - 6:20	Geologist Orientation	Barroom
6:20 - 7:20	Dinner Meeting	Banquet Room
7:30 - 8:30	Guest Speaker Presentation	Banquet Room

_____Place of Meeting_____

Cask 'N Cleaver Steakhouse, Riverside, CA
(Meeting Cost $24.00 to $32.00)
(Fund-raising donation suggested is $5.00, or more)
(*RSVP/Directions below*)

RSVP Due COB 17-Jan-09 Please Send Name, Company/Affiliation to Rick Gundry e-mail to :rick.gundry@verizon.net

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This Month's Speaker:

John Izbicki, Ph.D., *Research Geochemist U.S. Geological Survey, Water Science Center, San Diego California*

Abstract

Chromium mobilization from the unsaturated zone

John A. Izbicki[1], Thomas R. Kulp[2], Thomas D. Bullen[3], James W. Ball[4], and David R. O'Leary[5]

Recent work has shown that natural Cr(VI) concentrations in oxic, alkaline aquifers, especially those in mafic terrains, occasionally exceed the California Maximum Contaminant Level for chromium of 50 mg/L. $d^{53}Cr$ data in the western Mojave Desert intended to define the margin of a chromium contamination plume in an area having high natural background Cr(VI) concentrations revealed high Cr(VI) concentrations having near-zero $d^{53}Cr$ compositions at the top of the water table upgradient from obvious point sources of contamination. These values may be related to overlying land uses, especially land uses associated with large concentrations of animals. In the study area, high-sulphate concentrations, exceeding 2,000 mg/L, that are associated with animal-waste discharges appear to have mobilized Cr(VI) sorbed on iron and manganese oxides. This may occur because sulphate is an oxyanion having sorptiveproperties similar to those of Cr(VI). Oxic conditions in the unsaturated zone limit the reduction

of Cr(VI) to Cr(III) despite the obvious presence of organic reductants. The reduction of Cr(VI) to Cr(III) is further limited by high-nitrate concentrations, exceeding 200 mg/L as N, that provide a more thermodynamically favourable electron donor—thereby partly inhibiting the reduction of Cr(VI) to Cr(III). As long as high-nitrate concentrations persist, Cr(VI) can persist in both the unsaturated and saturated zones at the site, even if anoxic conditions develop. Although these processes are probably more important in unsaturated zones in mafic terrains they also may occur in other geologic settings.

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Speaker Biography

John Izbicki attended West Virginia University, Penn State University, and obtained a Ph.D. from the University of California Riverside in 2000. Dr. Izbicki worked as a hydrologist for the U.S. Geological Survey for 25 years and spent the last 15 years in southern California. While in California, he has focused on studies designed to apply environmental tracers to further the understanding of physical hydrologic processes. These studies addressed issues related to seawater intrusion and brine invasion, natural and artificial recharge processes, stormwater and beach contamination, well-bore hydraulics, and the occurrence and distribution of trace elements in desert environments.

Message from the Chair

HAPPY NEW YEAR!

And what a year it will be. We begin this year with Dr. John Izbicki, USGS Hydrologist speaking at our January meeting on the mobilization of chromium in the groundwater regime. In February, Dr. Jeff Keaton will speak on his research regarding the Scour of Rock.

On February 19 & 20, the AEG Shlemon Specialty Conference on "Investigation, Risk Analysis, and Mitigation of Surface Faulting" will be held in Palm Desert, California. Details on this conference follow later in this newsletter. A brochure, information, and a registration form for the conference can be accessed from our website (www.aegsc.org) or from the National AEG website homepage (www.aegweb.org).

In March, we will descend on the desert for our Annual Chapter Field Trip. Field trip Chair Mark Spykerman is planning a field trip, "Hydrogeology of Springs in the Palm Springs Area: Field trip to Indian Canyon and Agua Caliente Springs". Please let Mark know if you will be able to attend this trip. See more details later in this newsletter.

In April, Dr. Ed Medley, AEG/GSA Jahn's Lecturer will speak to our Chapter and all three local universities: University of California at Riverside, California State University at San Bernardino, and Cal Poly Pomona. Topics are still being selected, but Dr. Medley has a suite of interesting and entertaining talks on rock mechanics,

Your officers are in discussion to determine the topic of our annual chapter short course. Stay tuned for more on this issue.

So you can see there is a lot to learn from the topics this year. SUPPORT YOUR CHAPTER and attend chapter meetings. We hold these meetings for you! This is where networking occurs. See your there.

Dr. Kerry Cato, Chair – Inland Chapter

Cato Geoscience, Inc.

Attendees at the November Chapter Meeting

We were given an excellent talk on the groundwater condition in the San Bernardino Valley by USGS Hydrologist Wes Danskin, of the California Water Science Center, San Diego.

Meeting attendees were:

1. Mark Doerschlag, Consulting Engineering Geologist, Riverside
2. Mark Spykerman, Earth Systems Southwest, Rancho Cucamonga
3. Mike Cook, Kleinfelder, Redlands
4. Wes Danskin (speaker), USGS, San Diego
5. Doug Johnston, Petra, Murrieta
6. Rick Gundry, Inland Geologic, Inc., Moreno Valley
7. Lisa Battatio, Leighton Group, Palm Desert
8. Ernie Roumelis, AKW Geotechnical, Temecula

AEG Shlemon Specialty Conference on Surface Faulting

Evaluation, Risk Analysis, & Mitigation of Surface Faulting

Palm Desert, CA, February 19–20, 2009

This symposium and the associated AEG Special Publication will document technical issues that bear on the review of an important law in California—The Alquist-Priolo (AP) Fault Study Act. This law, that regulates development on active surface faults, has been in existence for 35 years and is currently under review by the California State Mining and Geology Board. It is anticipated that the proceedings of this conference will be used by the Californian Mining and Geology Board in their decision whether to make changes in this high profile law governing the practice of geology in the State of California.

The technical program will focus on:

- The history, standard of practice, and trends in future investigations regarding surface faulting,
- The identification and characterization of active (and potentially active) surface faulting and secondary ground displacement,
- The present capabilities of engineering design to accommodate small amounts of fault offset in single--family residential and larger structures, and
- The application of probabilistic assessments of earthquakes on faults to evaluation of the potential for surface fault rupture. This type of professional association activity is crucial to the mission of AEG. This

makes AEG pertinent on technical issues involving the practice of geology in California. While this particular issue focuses on California, other western states such as Utah, Nevada, Oregon, and Washington will be monitoring these actions. California fault rupture criteria are commonly referenced on projects in other states and internationally where there are not criteria for active fault definition and mitigation. There are parallels to be drawn regarding other geologic processes such as fault development in areas of subsidence (Louisiana, Texas) and in areas of ground cracks (Arizona, Nevada).

For more information, go to the home page of www.aegweb.org.

March AEG Chapter Annual Field Trip

We are still gathering info for a Chapter Field trip, but preliminary agenda for this ½ day trip follows:

"Hydrogeology of Springs in the Palm Springs Area: Field trip to Indian Canyon and Agua Caliente Springs"

Probable agenda will include:

- Meet at the Agua Caliente Resort in morning and then carpool to Indian Canyon (tribal land).
- Hike up Indian Canyon to review the springs and related geology.
- Return to the Agua Caliente Spring for a brief walk around to see the spring (now currently under the street near the casino) and discuss the theory's on its manifestation, geology, and chemistry.

This is an excellent opportunity to see an area that is normally restricted to public access. The springs and hydrology along the San Jacinto Mountain front are an important key in understanding the local geology. Please let Mark Spykerman know if you will be able to attend as we would like to get a count prior to the event (mspykerman@earthsys.com, (909) 484-5455). This Field Trip will be held instead of a monthly Chapter meeting.

CSU San Bernardino MS option in geology

To all current students who are planning to graduate in June and to all past students who are considering getting a masters degree. A new geology option in the Environmental Sciences MS program has been approved by the campus curriculum committee and should be in place for the Fall quarter 2009. If there is a reasonable number of students in this option next year we can probably request that a MS in geology be approved as a permanent degree program in addition to the current MS in Environmental Sciences. The current MS in Environmental Science is presently being offered as a 5-year pilot program, last year is next year. The request to make these programs permanent has to be made sometime during the 2009-2010 academic year. The deadline for enrollment for Spring quarter 2009 is January 15, and for Fall 2009 is May 1 2009. You can enter into the current MS in ES and transfer into the geology option in the Fall. I should like to urge all interested students to apply for this program now so that we have a chance of getting a MS degree in geology approved. Failure to achieve this next year will probably mean that we will have to propose the degree program through the regular channels, not a pilot program, which will take about 5 years to get approved.

- Alan L. Smith,Chair, Geological Sciences

January Meeting Details and Location

RSVP Due by COB 15-Jan-09 Send Name, Company/Affiliation by e-Mail to rick.gundry@verizaon.net

Location:

Cask 'N Cleaver Steakhouse
1332University Avenue
Riverside, CA 92507
(951)682-4580

Directions to Meeting:

From the 60/215 in Riverside, Exit at University Avenue and Turn West. Travel about 1/8th-mile or less, crossing Iowa Avenue to TURN RIGHT into parking lot for Cask 'N Cleaver Steakhouse.

Menu items for Selection at Meeting:

Charbroiled Teriyaki Chicken	$24
Famous 8 oz. Top Sirloin	$28
Charbroiled Salmon	$30
Slow Roasted Prime Rib	$32

Includes one of nine Premium Sides and tea, coffee or soft drink
Cost includes tax and gratuity with private banquet room.
Bar Available (No Host)

Future AEG Inland Empire Chapter Meetings

FEB Wednesday February 18th, 2009
__ __ "Scour of Rock – Rates and Threshold Conditions"
Dr. Jeffrey R. Keaton, MACTEC, Los Angeles, CA

MAR Saturday, March 14th, 2009
Annual Chapter Field Trip
__ __ "Geohydrology of Springs in the Palm Springs area; Field trip to Indian Canyon and Agua Caliente Springs"
Mark Spykerman, Earth Systems Southwest, Rancho Cucamonga/Palm Desert

APR Wednesday April 15, 2009, Cal Poly Pomona
__ __ GSA/AEG 2009 Jahns Distinguished Lecturer in Engineering Geology
Dr. Ed Medley, Geosyntec Consultants, Oakland CA

AEG Coordinated Dr. Medley's University Talks:

Tuesday, April 14, 2009, Riverside
Hewett Club Meeting, 4:00pm University of California, Department of Earth Sciences

Wednesday, April 15, 2009, San Bernardino
Geology Club, 2:30-3:30pm, Geological Sciences Department, California State University, San Bernardino

Thursday, April16, 2009, Pomona
Geology Club Meeting, 12-Noon - 1:00–pm, Department of Geological Sciences, Cal Poly Pomona University

SHORT COURSES

FEB February 27, 2009, Huntington Beach
— — "Cone Penetration Testing for Environmental and Geotechnical Professionals
Gregg Drilling (562) 427-6899 www.greggdrilling.com.conf/seminars.htm

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INLAND EMPIRE CHAPTER

Program Chairman/Newsletter Editor, Rick Gundry (see above); Webmaster, Dr. Kerry Cato, Cato Geosciences, Kerry@catogeoscieces.com; Field Trip Chairman, Mark Spykerman, Earth Systems Southwest, mspykerman@earthsys.com; Membership Chairman, Richard Orr, Leighton Group, Rorr@leightongroup.com;

Past Presidents; Frank Jordan, 2005; Gary Wallace, 2006; Rick Gundry, 2007, Mike Cook, 2008.

The AEG Inland Empire Chapter *Newsletter* a monthly publication of Inland Empire Chapter of the Southern California Section, Association of Environmental and Engineering Geologists. For more information visit websites shown in Newshead page 1 or for Officers, page 2.

Submittals: Deadline 28th of the month. Employment notices, job position vacancy announcements no cost..
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