WELCOME TO KENTUCKY!

WE CORDIALLY INVITE YOU TO THE 42ND ANNUAL MEETING AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS

LEXINGTON, KENTUCKY OCTOBER 9 – 14, 2005

“GEOLOGIC INFORMATION RACING INTO THE DIGITAL AGE”

FOR INFORMATION, CONTACT TOM SPALDING AT Phone No. (502)458-1209, Email: AIPG2005@YAHOO.COM

PLEASE VISIT OUR WEB SITE AT www.professionalgeologist.org

Photographs from Kentucky Tourism.com
THE PROFESSIONAL GEOLOGISTS

MARCH/APRIL 2005

Volume 42, Number 2

Tsunami/Emergency Well Disinfection Guide .......................... 11-12
Motivation For Real .............................................................. 15
Forensic Geology vs. Geologic Law ........................................ 29-30
AIPG 42nd Annual Meeting - CALL FOR PAPERS .................. 31-32
AIPG History Book - Available Now! ...................................... 33
AIPG Membership Classifications and Requirements ............... 35
AIPG Student Chapters - NEW STUDENT CHAPTER ............... 20

PEER REVIEWED ARTICLE

Environmental Geology and Sustainability .......................... 41-43

AIPG STORE - NEW ITEMS!... NEW ITEMS!... NEW ITEMS! .... 44-45

DEPARTMENTS

EDITOR'S CORNER ................................................................. 2
LETTERS TO THE EDITOR ...................................................... 2-3
MEMBERS IN THE NEWS ...................................................... 4-7
BOOK REVIEWS ................................................................. 8-9
PRESIDENT'S MESSAGE ...................................................... 13-14
EXECUTIVE DIRECTOR'S COLUMN — AIPG and Professional Employment .......................... 16
TEST YOUR KNOWLEDGE .................................................. 17-20
PROFESSIONAL ETHICS AND PRACTICES — Column 96 ............ 21-23
MEASURING THE PROFESSION — Column 8 .......................... 24-25
PROFESSIONAL LIABILITY AND RISK MANAGEMENT — Column 8 ...................... 26-28
STUDENT’S VOICE — Column 7 ............................................. 28
AIPG STUDENT APPLICATION FORM ....................................... 34
NEW APPLICATIONS AND MEMBERS ................................... 35
AIPG MEMBER APPLICATION FORM ..................................... 36-38
PROFESSIONAL SERVICES DIRECTORY ................................. 39-40

FRONT COVER — View of the conspicuously bound early Proterozoic-age Biotite schist (right foreground) and the middle Proterozoic-age Silver Plume Granite that forms Hallet Peak (right background), in Rocky Mountain National Park, Colorado. These formations and other related units, some of the oldest rocks exposed in the park, were the source of the material comprising Holocene and upper Pleistocene age rock glaciers that accumulated along the sides of high altitude valleys (center). Photograph by John W. Jengo, CPG-08139.

American Institute of Professional Geologists (AIPG) is the only national organization that certifies the competence and ethical conduct of geological scientists in all branches of the science. It adheres to the principles of professional responsibility and public service, and is the ombudsman for the geological profession. It was founded in 1963 to promote the profession of geology and to provide certification for geologists to establish a standard of excellence for the profession. Since then, more than 10,000 individuals have demonstrated their commitment to the highest levels of competence and ethical conduct and been certified by AIPG.

The mission of the American Institute of Professional Geologists (AIPG) is to be the superior advocate for geology and geologists, to promote high standards of ethical conduct, and to support geologists in their continuing professional development.
EDITOR’S CORNER

QUESTIONS OF THE MONTH

The following questions are offered to stimulate some discussion and get feedback on personal experience and research efforts. The questions do not reflect the position of AIPG or the Editor. Send your response and suggestions for future questions to wjd@aipg.org.

1. Should AIPG develop short courses in the geological sciences for CEU credits? If so, what type of courses?

2. Would a tsunami warning system have been effective for the recent tragedy in Southeast Asia?

It seems like only yesterday that we were preparing for the Annual Meeting in Saratoga Springs and brainstorming on what the yearly student issue of TPG (January/February) should contain. Both of these events have occurred and I would like to express my congratulations to the NE-AIPG Committee who made this Annual Meeting a tremendous success. From the net proceeds of this meeting, the NE-AIPG made substantial contributions to both the AIPG Foundation and the Angelo Tagliocozzo Memorial Scholarship Trust Fund.

This year’s student issue exceeded all expectations! You simply have to look at the length of this issue (78 pages) and the number of contributors (29 members). This was the largest single issue of TPG ever published according to Wendy Davidson and Bill Siok and why it took a little bit longer getting into print and on the AIPG web page. Wow! The credit goes to you – the responses were as diverse as our membership and supportive of the next generation of geologists. If there is a central theme it is – the pathway you walk through your geological career is not straight and certainly not boring or without stumbles and trips, but if you are not afraid of a challenge or a new adventure you will have a smile on your face and a lot of interesting stories at the end of the day.

Over the past few months, there have been many natural disasters reported by the media. One in particular, the tsunami that ravaged Southeast Asia, resulted in the loss of many lives in many countries around the Indian Ocean. From our Introductory Geology course, these natural disasters have been described in geological terms (i.e. plate tectonics, earthquakes, mass-wasting). If the geological curriculum is modified to include fewer geological courses, how will fieldwork, recognition of geologically-sensitive areas, and research continue for geological hazards? Will there be specialized programs for this? Will we still be called geologists or earth scientists or CSI: Geology? Your thoughts on this are greatly appreciated and welcome.

On a personal topic, our lives are not only geology. One of my co-workers, Dave Mattimore, who is also a CPG, has just been deployed to Iraq along with other members of the New Hampshire National Guard. Dave is a helicopter pilot. His mission is to fly an ambulance helicopter where needed in support of the on-going United States effort. I am proud of Dave. He has made a great sacrifice to be away from his family and friends. Even with this diversion from Dave’s geological pathway, his job is secure and we await his safe return.

LETTERS TO THE EDITOR

Dear Editor:

I would personally like to thank all those who contributed in giving the free AIPG student memberships at the GSA annual convention. Jeanette Truong the geology club president from Georgia State University was one of those students that signed up for membership. Soon afterwards she received the Georgia Section newsletter and attended our meeting in December. We had discussions at that meeting about the possibility of forming a student chapter and she along with help from the Chairman of the department, Dr. Tim La Tour, were able to sign up six other students and petition the Georgia Section and National for the formation of a student chapter. This would probably not have happened without the generosity of those members that gave and I greatly appreciate it.

Ron Wallace, CPG-08153

Dear Editor:

Below is a photograph sent to me by a supporter of the current BGG in California. It shows graphically one of the main reasons why both South Carolina and California require competent geologists, and why we all need to ensure that a Board for Geologists and Geophysicists, whose decisions are open to public discussion, endures, in spite of the efforts of the sponsors of the current administrations of both states.

Registration and continuing development of geologists is one way to help ensure competency. We may eventually ascertain who allowed this housing development to be built on a geologically active landslide (with heavy rains resulting in a ‘debris flow rotational slide’).

Jane H. Gill
(JaneHGIll@aol.com)

Slide 21 - La Conchita, California - a small seaside community along Highway 101 south of Santa Barbara. This landslide and debris flow occurred in the spring of 1995. Many people were evacuated because of the slide and the houses nearest the slide were completely destroyed. Fortunately, no one was killed or injured. Photograph by R.L. Schuster, U.S. Geological Survey.

www.aipg.org
LETTERS TO THE EDITOR

Greetings AIPG:

Preventable childhood diseases still claim way too many lives in areas that we have expertise: clean water supply and water treatment. This is the time that we must take our American leadership and go outside of our own houses and into the houses of others less fortunate to assist them with meaningful projects and training that we know we can perform.

Leadership is not easy, but I request AIPG’s assistance in helping me set up this non-profit organization. I hope AIPG will take an interest in helping to fund the concept and maybe others at AIPG will have an interest in serving on the board once the Institute is established. Professional growth from these types of exchanges can be rewarding and meaningful. I have included an article that appeared in The Professional Geologist (AIPG) several months ago.

I estimate that I will need about $5,000 seed money to start the organization and any grant would be greatly accepted.

Please let me know your thoughts.

James A. Jacobs, CPG-07760,
R.G. #4185, C.H.G. #88
Tel: 415-381-5195
Web site: www.EBSinfo.com
e-mail: augerpro@sbcglobal.net

Editors Note: If you wish to learn more or contribute please contact Jim Jacobs directly.

Resignation

I promised myself when I joined this organization that I would not be a “hanger on” as some have been in the past. I tried last year but was talked out of it. Now is the time .... This hunt is over!

My membership has been a joy and the friends I’ve made are many. I wish AIPG continued success and long life. I am proud to have been a small part of its history. Thank you again for my Charter/Emeritus certificate.

Frederick L. Stead, CPG-567

Dear National Headquarters,

Kudos for emailing that job announcement. As an aside, it was professional services such as these that drew me to AIPG and that I originally had hoped to take advantage of when I first joined the Institute at, albeit, a much younger and less-experienced age (1978) ... and when the Institute showcased these exact kinds of services. I judge that if we could offer more “high profile” professional support services direct to our membership like you just did, and perhaps demonstrate any resulting successes in the TPG, we would see increased interest from our younger Membership Applicants - perhaps dramatically so.

I also used to push for selective advertising in local Section newspapers (ie. regular ads that might say something along the lines of: “Hire your local Geologist for this kind of service ... instead of your engineer or surveyor”) but as we can all understand, such expenditures of precarious Section funds almost always fell on deaf or indecisive ears. Can we do ads with the various colleges and universities to drum up student interest/internships (with our Member organizations) in Geology, if and when the Institute’s local Section coffers do appear relatively healthy and certain monies are made available? Perhaps some Sections are doing this already. And given how much geology and we geologists are in the news lately, particularly with quotes on the tsunami, plate tectonics, etc., and all the public safety threat, it seems an opportune time for AIPG to speak up.

Just some ramblings, and to wish you a Happy New Year!

Charlie Rich, CPG-04433
NE Section Screening Chair

State of California

With the passage of Senate Bill 1914 in the Fall of 2004, the name for licensed geologists in the State of California changed from Registered Geologist (RG) to Professional Geologist (PG). This change in the law became effective on January 1, 2005. Individual license numbers will remain the same, but all new pocket licenses and wall certificates will state Professional Geologist. Existing wall certificates and pocket licenses are still valid and do not need to be replaced.

The intent of the law is to bring California licensees in line with what every other State utilizes to identify their licensed professionals. This will facilitate cooperative licensure (reciprocity) with other States. It should also mitigate the confusion caused to consumers by Registered Geologists being grouped with Registered Environmental Health Specialists (REHS) and Registered Environmental Assessors (REA), both of which are unlicensed titles.

The titles Certified Engineering Geologist (CEG) and Certified Hydrogeologist (CHG) are still valid and are not affected by this change. Registered Geophysicists (RGP) did not have their license renamed. The following is the link to the legislation:


Paul Sweeney
Executive Officer
Board for Geologists and Geophysicists
California Department of Consumer Affairs

www.aipg.org
MEMBERS IN THE NEWS

Honored as Distinguished Alumni at South Dakota School of Mines and Technology (SDSM&T)

James E. Martin (Geol 71), CPG-07367, was born in Rock Springs, Wyoming. He earned his bachelor’s and master’s degrees in geology from SDS&M&T and graduated from the University of Washington with a Ph.D. in geology. He became the curator of vertebrate paleontology at the SDSM&T Museum of Geology and professor of Geology and Geological Engineering in 1979.

Martin’s work in paleontology has established his international reputation and advanced the reputation of SDSM&T as well. In 1999, Martin was honored by the Royal Geographical Society of London as the first American to receive the prestigious International Discovery of the Year Award.

In 2004, the National Science Foundation (NSF)/Polar Research Program recognized Martin and his colleague, Dr. Judd Case of St. Mary’s College, when they found a unique dinosaur fossil from Antarctica. Martin was subsequently invited to the NSF National Press Club in 2004 to discuss this discovery and to credit his numerous field assistants.

While his paleontological work has been recognized around the world, Martin has also dedicated his talents locally by updating the South Dakota State geological map and marking substantial increase in detail since last published maps in the 1950s.

It goes without saying that Martin’s professional affiliations, consulting work, publications, and field findings have benefited SDSM&T along with numerous other entities, companies, and organizations. But perhaps the most important service Martin performs for his profession and community is to the students at SDSM&T. He shares his own excitement about paleontology with his students and ensures they get the best education possible at SDSM&T. The standards Martin sets in the Paleontology Program guarantee that students graduating from this program are of excellent caliber and dedicated to the field of paleontology.

SDSM&T Foundation Update, January 2005

Medal of Merit Award

During the European Federation of Geologist’s (EFG’s) June 2004 Council meeting in London, the third Medal of Merit was awarded to Richard Fox of the AIPG (1989-1999). This eventually led to the reciprocal Associate Membership between the EFG and AIPG.

Although he retired from representation in 1996, he was still heavily involved in important auxiliary roles including Chair of the Registration Committee and then the Registration Authority, which he concluded with distinction in London in June 2004.

Above all, Richard was a fine representative of the federation and we all remember his consummate skill when in 1992 he addressed first the Regional Assembly of Castilla Y León in Salamanca, Spain, and later a special meeting of the European Parliament in Brussels.

Richard was Director of Land Search for ReadyMixConcrete until he retired recently and now operates his consultancy Richard Fox & Associates in Winkfield near Windsor.

European Geologist, December 2004

South Dakota Section Establishes Award in Memory of Dr. John Paul Gries

In 2004, The South Dakota Section of AIPG recognized the need to honor geologists who have done exemplary work in the field of geology in South Dakota. It was decided to initiate an annual award named after an eminent geologist in South Dakota who practiced a wide range of geologic disciplines. Arriving at the “John Paul Gries Geologist of the Year Award” was an easy decision in honor of Dr. Gries and his many decades of work ranging from stratigraphy to hydrology to mining. Dr. Gries was a long time member of AIPG and the South Dakota Section.
MEMBERS IN THE NEWS

Any geologist who has done exemplary work in South Dakota may be nominated for this award, but need not necessarily be a member of the South Dakota Section of AIPG. Please send nominations for 2005 and a short description of the person’s accomplishments in geology to the address below by March 12, 2005. It is not necessary for the exemplary geological work to have been accomplished in the past year due to the fact that such accomplishments often take many years of work. A winner will be selected and announced at the Section’s annual luncheon at the Ramkota River Center in Pierre, South Dakota on March 17, 2005. The winner does not have to be present at the luncheon to receive the award.

Nominations should be directed to:
Tom Durkin, SD Section President
SD School of Mines & Technology
SD Space Grant Consortium
501 E. Saint Joseph St.
Rapid City, SD 57701
E-mail: Thomas.Durkin@sdsmt.edu

Dr. J. Paul Gries passed away on March 28, 2003. Dr. Gries joined the faculty of South Dakota School of Mines in 1936. During his long and distinguished career, he also served as Graduate Dean. He retired from active teaching in 1976 but continued to serve as Professor Emeritus for 25 years. Dr. Gries (CPG 771) was an active member of AIPG for 33 years.

Dr. Gries cleaned out his office in 2002, it felt like the end of an era, but in keeping with his character he didn’t spend much time being sentimental. He simply kept a few mementos and told us to use whatever we could of the things that remained. We will, Dr. Gries’ well files, spanning almost 65 years since his arrival in the Black Hills in 1936, will form the basis for the planned J. Paul Gries Well Information Center (see below).

Many of you know that in 1996 Dr. Gries published his book, "Roadside Geology of South Dakota.” It is printed by Mountain Press Publishing Company as part of the series that includes most of the Rocky Mountain region. The book is available through the Department of Geology and Geological Engineering for $20 plus shipping costs. The geological information alone makes it worth reading, but even more enjoyable are Dr. Gries’s sharp-witted comments and incomparable writing style.

In 1992 Dr. Gries wrote a short history of the Department of Geology and Geological Engineering. Entitled, “A Century of Geology at the South Dakota School of Mines,” it relates some of the highlights and colorful stories of the department’s long history — about two thirds of which Dr. Gries experienced first-hand. If you are interested in getting a photocopy, please let me us know. It is about 20 pages long (double spaced), so copying and shipping costs will be less than $10.

J. Paul Gries Well Information Center

During his long career at the School of Mines, Dr. Gries was involved in the drilling and logging of an incredible number of wells in western South Dakota. The files he amassed are not only a historical treasure but are useful almost every week for supplying information to the public about water wells, aquifers, and depth to water. Perry Rahn, Arden Davis, Jim Fox, and others in the department regularly get calls from Black Hills residents who are drilling new water wells or seeking related information. Because of the value of Dr. Gries’s files, the Department of Geology and Geological Engineering is establishing the J. Paul Gries Well Information Center, which will include his drilling logs, well files, and maps. The center will be housed in the department’s map room.

2005 Recipient of the New Mexico Earth Science Achievement Award

John W. Hawley, CPG-02309, is one of the recipients of the 2005 New Mexico Earth Science Achievement Awards. These awards, co-sponsored by the New Mexico Bureau of Geology and Mineral Resources and the Energy, Minerals and Natural Resources Department in Santa Fe, are presented annually to honor individuals who have made outstanding contributions to advancing or facilitating the role of geoscience in areas of education, research, public service, and public policy in New Mexico. Selections were made following a statewide nomination process. John’s technical expertise in the geology and hydrogeology of New Mexico, combined with his professional and scientific integrity and contributions to public service and policy, have earned him the unequivocal respect of his peers, colleagues, and clients.

The presentation of the award occurred in the rotunda of the state capitol building on January 28, during the legislative session and in conjunction with Earth Science Day. The presentation of the award was made by Dr. Dan López, president of New Mexico Tech.

Peter A. Scholle, MEM-0350, New Mexico State Geologist & Director

Larry Rhodes, CPG-02250, has been named Vice President over the Geotechnical Division and brings over 40 years experience to the CAE team. With Larry comes an extremely capable staff of geotechnical, lab, and drilling specialists.

Tsunami

Robert Sanders, CPG-06460, spent January in Thailand assessing damage from the December 29th Indian Ocean Tsunami as a member of a six man Forward Engineering Support Team-Advanced (FEST-A) of the U. S. Army Corps of Engineers, Alaska District. He reports that the details of the damage varies greatly from place to place along the Phutak and Khao Lok coasts. In some places the breaking wave front caused extraordinary impact damage, but in other places the flood was merely a

www.aipg.org

MARCH/APRIL 2005 • TPG
MEMBERS IN THE NEWS

Larry Woodfork Represents US National Academy of Sciences

Larry D. Woodfork, CPG-02370, a Morgantown, WV consulting geologist, was appointed again this year by NAS President Bruce Alberts to be a member of the 2004 US delegation to the 32nd IGC IUGS Council. The other 7 delegates appointed were Grant Heiken, Los Alamos National Laboratory; Mark Cloos, Chair, Department of Geological Sciences, University of Texas; Farouk El-Baz, Director, Center for Remote Sensing, Boston University; Suzanne Mahlburg Kay, Professor, Department of Geological Sciences, Cornell University; Susan Landon, CPG-04591, Petroleum Geologist, Thomasson Partner Associates, Denver; Patrick Leahy, CPG-10507, Associate Director for Geology, U.S. Geological Survey; and Eldridge Moores, Distinguished Professor Emeritus, Department of Geology, University of California, Davis.

Woodfork had also previously served on the US delegation to the 31st IGC held in Rio de Janeiro, Brazil, in 2000.

In addition to his duties as a delegate to the IUGS Council in Florence, Woodfork participated in several other functions and ceremonies at the 32nd IGC. As a past president of the American Geological Institute (AGI), a federation of 43 earth science societies with 120,000 members worldwide, and an organization affiliated with the IUGS, he presided over an AGI awards ceremony (photo attached). Accompanied by Susan Landon, also a US delegate and former AGI president, Woodfork presented the AGI Explorer Award to Eduardo F.J. de Mulder from the Netherlands, President of the IUGS; and Werner R. Janoschek from Austria, IUGS Secretary-General, in recognition of their visionary and dedicated leadership in the international geoscience community.

Later in the ceremony, Woodfork brought greetings and a commendation to the IUGS from the Honorable Joe Manchin III, Secretary of State of West Virginia, in the form of a Certificate of Excellence from Secretary Manchin recognizing the contributions of the IUGS and geoscientists to human welfare and the betterment of society. He also conveyed commissions from Secretary Manchin to both de Mulder and Janoschek designating them Honorary West Virginians.

At the final IUGS Council meeting this year, delegates selected Oslo, Norway to be the site for the 33rd IGC in 2008 and Brisbane, Australia to be the site for the 34th IGC in 2012. Between congresses much of the work of the IUGS is accomplished through its various commissions, subcommissions, task forces and initiatives. The Council unanimously endorsed an ambitious new initiative to be undertaken between now and the 33rd IGC – The International Year of Planet Earth. Although 2006 will be the official International Year, the initiative will begin in 2005, with the UN declaration scheduled for 2006 and the project to continue through 2007. The International Year of Planet Earth was conceived by the IUGS, endorsed by UNESCO’s Division of Earth Sciences and backed by all IUGS sister unions in related disciplines. The International Year will place equal emphasis on research and outreach activities demonstrating the potential of the earth sciences to lay the foundation for a safer, healthier and more prosperous society. Following that, the council also ratified the formation of a new Commission on Fossil Fuels. Following the Council meeting, in recognition of his long standing leadership in the US geoscience community and his background and expertise in fossil fuels, Woodfork was appointed a senior advisor to the IUGS for the International Year of Planet Earth and asked to serve as a member of its newly authorized Commission on Fossil Fuels.

Commenting on his selection to serve in these two new IUGS assignments, Woodfork stated: “I’m very pleased...
and excited to have the opportunity to be of further service to the international geoscience community. It is, of course, an honor and privilege to be involved in these important activities. Coincidentally, they are both nice synergistic fits with other projects I am currently involved in with other organizations. One example would be the 2005 International Symposium on the History of the Oil Industry to be held at the Radisson Hotel in Morgantown, WV this coming April. The Petroleum History Institute (PHI) – formerly the Drake Well Foundation – is the sponsor of the symposium. Several academic departments and units at West Virginia University, as well as the Oil and Gas Museum in Parkersburg, WV are co-hosts of the event. I am general chairman. The symposium will provide a great opportunity to raise the visibility of the West Virginia oil and gas industry in the international arena, increase public awareness of the important role it played in the early history and development of the American oil and gas industry, showcase the Oil and Gas Museum in Parkersburg, and give petroleum engineering and geology students an opportunity to make important contacts with industrial leaders.” Visit www.petroleumhistory.org for complete details.

Although a native Hoosier, Woodfork has spent most of his adult life and professional career in West Virginia. After receiving his undergraduate and graduate education at Indiana University, he began his professional career as an exploration geologist in the oil industry. In 1968 he joined the West Virginia Geological and Economic Survey (WVG&ES) in Morgantown. After completing a 34-year career with that agency he retired as Director and State Geologist in 2002.

Woodfork is a licensed professional geologist, certified professional geologist, certified petroleum geologist and senior fellow in the Geological Society of America. He has served as president of three national geological organizations – the American Institute of Professional Geologists, the Association of American State Geologists and the American Geological Institute and received numerous prestigious awards for his service and contributions to the geosciences. He currently divides his time among his private geological consulting practice, service on the board of directors of several research and educational foundations and his continuing involvement in a number of scientific and professional organizations. In addition, Woodfork serves as an adjunct professor of geology at both West Virginia University and Marshall University.

IS YOUR PROFILE CORRECT?

It is important to keep your address, phone numbers, and e-mail information up to date in our records. Please take the time to go to the AIPG National Website <www.aipg.org> login to the member portion of the site and make sure your information is correct. You can edit your record online. If you do not know your login and password you can e-mail National Headquarters at aipg@aipg.org or call (303) 412-6205.

Thank you

Just don’t have time to round up all that stray data?

We Can Handle It.

GDM’s experienced G&G professionals are standing by, ready to do the homework, find the data that you’re missing, organize it, analyze it and hand it over to you in electronic format so you can

Get Your Job Done.

GeoScience Data Management

Houston (281) 364-0793, Dallas (972) 509-1522

Call for details or visit our website - geodm.com
BOOK REVIEWS

WILEY’S REMEDIATION TECHNOLOGIES HANDBOOK

Hundreds of interesting remediation technologies for soil and groundwater have been developed over the past two decades. As one who has gone to dozens of hazmat shows, I have file folders full of various specialty vendor brochures and pamphlets for numerous technologies. My bookshelves have numerous United States Environmental Protection Agency (US EPA) reports detailing various technologies and remedial strategies. However, locating the specific technology information in a short period of time is sometimes difficult and available information is frequently incomplete or outdated. For those having a need for a decent reference of remediation technologies indexed to major contaminant chemicals and chemical groups, that can be accessed quickly, the solution is relatively simple.

Dr. Lehr is the senior scientist at AR Environmental Services Inc. and Science Director at The Heartland Institute. He is the author of twelve books and over 400 articles on groundwater science. Dr. Lehr has worked extensively with the federal government to develop key environmental regulations regarding surface and groundwater. What he has written in the Wiley’s Remediation Technologies Handbook is a collection of 901 technology solutions to remediate 368 chemicals and chemical groups. The accompanying CD has the complete database to look up a particular technology by chemical, vendor or site location. The remediation treatments range from the experimental and unusual. The various technology listings have the same format, allowing the reader quick access to the information. Each listing provides an abstract, technology costs, and information sources. Typical information sources include as the US EPA technology review reports, VISITT database, EnviroGlobe database, peer-reviewed journals, United Stated Department of Energy (US DOE), national laboratory reports, trade journals, conference proceedings, as well as information from the technology vendor.

As an example, gasoline, under the heading of total petroleum hydrocarbons in the index, has no less than 450+ technologies listed for treatment options of soil, vapor or water treatment. Some of the remediation technologies are for in-situ methods; other technologies are designed for above ground treatment of contaminants. The treatments range from in situ oxygen diffusers to ion exchange resins for above ground treatment of water to vitrification to soil washing to radio frequency heating to low-thermal desorption with heat recovery.

The index that lists the technologies applicable to specific chemicals provides insight when less common contaminants are being evaluated for remediation. Although gasoline has hundreds of technologies, tungsten and chlorodane are two contaminants that are less common in the environment and in remedial approaches. There are two technologies listed for tungsten remediation and thirty-one technologies listed for chlorodane. For regulators or consultants working with sites containing harmful levels of tungsten or chlorodane, for example, this book provides a good starting point.

The remediation technology entries contain details, uses and limitations such as lithology or other site conditions which are often described in the abstracts, providing the hands-on knowledge that might not be so obvious. For example, radio frequency heating cannot be used on a site containing large metal objects such as buried metal pipelines or underground tanks. The Chemical Stabilization Technology, a proprietary contaminant immobilization mechanism for treating soils, sludges, and ashes contaminated with toxic heavy metals and hydrocarbons, may be limited by the presence of oxidizers, such as chlorine, peroxide, permanganate, or persulfate. This type of information is sometimes not learned by new project managers until they are in the field and something has not gone well. Consequently, this book has significant value for a clear and concise overview of hundreds of remedial technologies listing some of the limitations and pitfalls for specific applications.

Because the book lists every significant chemical contaminant and the numerous technologies used to clean them up, Wiley’s Remediation Technologies Handbook is a worthwhile addition to the libraries of environmental consultants, regulators, and brownfield developers who need to know the types and costs of remedial options available for specific contaminants, the uses and limitations of each technology and appropriate references.

Reviewed by: James A. Jacobs, R.G., C.H.G., is president of Environmental Bio-Systems, Inc. He has 25 years of experience as a geologist and has been a two-time Fulbright award winner in environmental engineering. Comments: augerpro@scbglobal.net.

A History of AIPG 1963 – 2003

Reviewed by Gretchen M. Gillis, CPG-9693

A History of AIPG
1963 – 2003
by Richard J. Proctor, CPG-5091, AIPG Past-President
American Institute of Professional Geologists
ISBN 0-933637-05-5;
www.aipg.org
390 pages; paperback ($45), hardback ($80), or CD ($15).

“The plight of many earth scientists is of deep concern to our profession and should be of concern to our Government. Not only are earth scientists leaving the profession, but college majors in earth science have dropped to an alarming degree.”

I might have pegged this sentiment as vintage 1987 but for reading it in the fascinating new volume, A History of AIPG, in which it was reprinted from the first issue of The Professional Geologist. Similarly, the book includes a 1973 letter from Harrison Schmitt to President Nixon about the energy crisis that makes as much sense today as it must have then, fueling the aphorism that those who do not study history are doomed to repeat it.

Meticulous organization, anchored chronologically, lends the material in this massive treasury a useful and logical framework. Readers interested in specifics may easily navigate the comprehensive table of contents to learn about events and people involved in AIPG. Most interesting to me were the sections under the heading, “The Formative Years,” for I previously had no idea how AIPG took root. It seems...
BOOK REVIEWS

that many concerns that prompted the founding of AIPG persist today.

In 1962, visionary geologists recognized the lack of support for the profession of geology and made the first attempts at organizing using what is now known as "snail mail." Although some of the correspondence seems quaint, some hard-hitting exchanges describe the crucial differentiation and expected contributions of AIPG. Reminiscences from various members document the sustained effort necessary to implement a certification-granting professional organization that would meet the needs of professional geologists while averting conflict with extant organizations.

By its twentieth anniversary in 1983, AIPG had matured sufficiently that it had a balanced budget, 35 state sections, and numerous publications. Nevertheless, key objectives that year included building a membership more representative of the entire profession, participating more actively in public and governmental affairs, and improving the visibility of the organization.

The main text concludes with a synopsis of 2003, AIPG's fortieth year. Declining membership stemming from retirements and from perceived devaluation of certification led President Powers to articulate the strategy of increasing AIPG advocacy while encouraging certification. This represents a shift in priority from AIPG's early emphasis on certification, but it retains the focus on promoting ethical practice of geology.

Appendices document AIPG presidents, Executive Committee rosters, awards, annual meetings, AIPG publications, AIPG activities, and charter members. Selected speeches and papers by CPGs, archived in Appendix 9, are especially valuable for the lessons they offer to younger geologists. Appendices 10 and 11 describe the European Federation of Geologists, of which AIPG is an Associate Member, and the Canadian Council of Professional Geoscientists, with whom AIPG signed a Cooperation Agreement in 2001.

For all it contains, the paperback edition is relatively compact. Numerous black and white photographs break up the text and serve as a warning that meeting attendees should always look their best lest they be captured otherwise in a future edition! A charming touch is the inclusion of four sign-in sheets from the AIPG Founding Convention of 1968 in the back of the volume.

Not having lived as long as AIPG, I imagine that compiling the history of this august organization must have been a mixed blessing for author and AIPG Past-President Richard J. Proctor: fun for the obviously fond memories he recounts, and nightmarish for the sheer scope of the undertaking. Reading A History of AIPG has instilled in me a new appreciation for the many hurdles the leaders of the organization have crossed successfully, and an appreciation for the efforts of its founders and subsequent leaders.

In any undertaking of this size, readers must cope with a few small faults. For example, a speaker listed in the program of the 1966 Annual Meeting is described as “now” chairman of his university department. “Now” 2004 or “now” 1966? More careful attribution of the writer or speaker would add clarity to certain passages, as would use of quotations around all citational remarks. Nevertheless, Proctor and collaborators Virginia T. McLemore, Raymond W. Talkington, Wendy J. Davidson, Jessica R. Valero, and Lydia Testa have done a great service for AIPG and its members by capturing a wealth of important information and presenting it in an accessible format.

The Reviewer: Gretchen M. Gillis, Advisory Editor of the Schlumberger Oilfield Review, has worked in the oil and gas industry for 15 years.

A History of AIPG
1963 – 2003

Reviewed by
Adolf U. Honkala, CPG-00007

The History of AIPG is a most informative and interesting account of the Institute from its founding through 2003. Richard Proctor has done a remarkable job of reconstructing the Institute's origin and detailing the activities of the officers and the committees that have led AIPG from its inception.

For the average member whose interests may be "what's in it for me" there is a real story about a huge amount of individual and corporate effort that has taken place from 1963 to 2003. All the membership should read it and find that so many cared about the profession. I heartily recommend it to be read and kept in a prominent place on the book shelf.

Thank you Richard J. Proctor for your service to AIPG.

The Reviewer: Adolf U. Honkala is a Charter Emeritus member and is a founding member of the AIPG Foundation.

An order form for “A History of AIPG - 1963-2003” is available on page 31 of this issue or go to the AIPG National Website at www.aipg.org.
State Survey Completes Saratoga Geologic Map

The Wyoming State Geological Survey (WSGS) has released a new geologic map that encompasses major parts of the Medicine Bow Mountains and the Sierra Madre, including the towns of Centennial, Saratoga, and Encampment. WSGS geologists Wayne M. Sutherland and W. Dan Hausel compiled the new map, which is entitled Preliminary geologic map of the Saratoga 1:100,000-scale Quadrangle, Albany and Carbon counties, Wyoming. The project was funded in part through grants from the U.S. Geological Survey’s STATEMAP program.

The map was compiled from available geologic maps, aerial photograph interpretation, and reconnaissance field mapping where required. The Medicine Bow Mountains and Sierra Madre of southeastern Wyoming are Precambrian-cored uplifts that contain rocks ranging in age from Precambrian to Quaternary. These mountain ranges are cut by the Cheyenne Belt, a major geologic break between the older Precambrian Wyoming Province (Wyoming craton) to the north and the younger Precambrian Colorado Province to the south.

The new map incorporates localized areas of interest for some strategic metals and minerals including gold, platinum-group metals, chromite, titanium, vanadium, copper, diamond, other gemstones, and rare earth metals.

Large blocks of ground surrounding the Mullen Creek, Lake Owen, and Puzzler Hill mafic and ultramafic complexes within the map area have recently received considerable interest for platinum-group metals. Increased gold and platinum prices make the quadrangle especially interesting. The search for rare earth metals in the Big Creek district has also gained momentum during the past few years. The quadrangle has high potential for the discovery of significant gem and industrial diamond deposits.

The map area includes several historical mining districts including Gold Hill, Grand Encampment, Keystone, Douglas Creek, New Rambler, Big Creek and others; hundreds of historical mines and prospects lie within the map area.

AWG Links Women Geoscientists Worldwide

Eloise Kendy, AWG Rocky Mountain Delegate

No matter where in the world women geoscientists live and work, there’s a place for us to come together. Once isolated both personally and professionally, a growing number of women geoscientists stays connected through the Association for Women Geoscientists (AWG).

The world’s largest organization for women geoscientists, AWG provides opportunities and support for women at all stages of their careers. AWG is an international organization devoted to enhancing the quality and level of participation of women in the sciences and to introducing girls and young women to geoscience careers.

AWG was founded in San Francisco in 1977 to provide encouragement to women in the geosciences, a career choice where they were largely underrepresented at the time. Today, AWG membership approaches 1,000, reflecting the increasing participation of women in diverse fields ranging from geology to hydrology, geochemistry, geophysics, paleobiology, petrology, and earth science education.

“Our membership is brought together by a common love of earth science and the desire to ensure rewarding opportunities for women in the geosciences,” says AWG President Allyson K. Anderson. “Our members include professional women and men from industry, government, museums and academia, students from a cross-section of colleges and universities, retirees, and others interested in supporting our goals.”

Members gain access to networking, mentoring, resume reviews, scholarship opportunities, and awards that strengthen and sustain personal and career goals. As an affiliate of the American Geological Institute, AWG members also receive member rates for conferences and activities of other affiliated societies, including AIGP. Many AWG members promote their work through the distinguished lecture series and other outreach activities to people of all ages. In addition, AWG has local chapters in Houston, San Francisco, Puget Sound, Denver, Salt Lake City, South Florida, Minnesota, Central California, Kansas, and the Washington DC area that sponsor seminars, outings, and other activities in their communities.

AWG-sponsored geology field trips are a favorite way for members to connect. This year, Kata McCarville will lead a whitewater rafting trip down the Grand Canyon, and Nadine Langley will lead a camping trip along the eastern Sierra Nevada. Past field trips have visited Mexico, Scandinavia, the Black Hills, southwestern Colorado, Big Bend National Park, the Cascade Mountains, and Yellowstone National Park.

Members share their experiences, expertise, and interests bimonthly in the AWG newsletter, Gaea. In addition to featuring lively stories and discussions on technical and career-development topics, Gaea is a leading outlet for job advertisements by public and private entities that seek to expand workforce diversity.

For more information about AWG visit our website at www.awg.org.

www.awg.org
Tsunami / Emergency Well Disinfection Guide

The National Ground Water Association (NGWA) has developed an emergency well disinfection guide for use in the tsunami-stricken area. A very simplified procedure designed for people who have no expertise in wells. Also, it can be applied to drilled wells or shallow dug wells.

This advisory is designed for the treatment of wells under emergency conditions with limited equipment. Do not over treat wells with excessive chlorine. Be sure to leave the chlorine solution in the well for at least 6 hours. Any circulation of the chlorinated water in the wellbore or well hole will improve disinfection.

1. Disconnect the well from any water distribution system.
2. Begin pumping the well to flush the salt water and any debris from the well.
3. While the well is pumping, clean up any debris from around the well. Remove any standing water and taper the soil away from the well head so that surface water drains away from the well.
   The well will have to be pumped from one to three hours to remove the salt water. This can be checked by a conductivity meter (Ocean water will average 30,000 to 60,000 micro siemens). If a meter is not available, dip your finger in and taste the water. A salty taste indicates the need for continued pumping. If it is likely the water is contaminated, treat a glass of clear water with five drops of hypochlorite solution (5% liquid bleach) and wait several minutes. Then dip your finger in the water and taste to see whether all the flood water has been removed. If the pumped water is not clear, continue pumping until clear and free of sea water.
4. Pump some of the clear water from the well into a drum or tank (50 gallons or 200 Liters). Put a spigot near the bottom of the drum so a hose can be attached.
5. Add the amount of liquid bleach or cups (250mls) of powdered calcium hypochlorite indicated in the chart below and mix. Pump or siphon the hypochlorite mix into the well. A longer hose allows a deeper placement of the disinfectant solution. After removal of the hose, the pump can be momentarily used to allow the water to rise and fall back into the well. This should be done several times to mix the chlorine solution throughout the well. Let the well set for 6 hours or overnight, then pump the well and dispose of the pumped water until no chlorine is detected.

Smaller Diameter Wells / 1 cup = approximately 0.25 kilograms

<table>
<thead>
<tr>
<th>Approximate Depth of Water</th>
<th>Diameter 4” or 10 cm</th>
<th>Diameter 6” or 15 cm</th>
<th>Diameter 8” or 20 cm</th>
<th>Diameter 10” or 25 cm</th>
<th>Diameter 12” or 30 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meters Feet Liters Cups</td>
<td>Liters Cups Liters Cups</td>
<td>Liters Cups</td>
<td>Liters Cups</td>
<td>Liters Cups</td>
<td>Liters Cups</td>
</tr>
<tr>
<td>6 20 1 .5 2.5 1 3 1 4.5 1.5 7 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 40 2 .5 4.5 1.5 6 2 9 3 13.5 4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 60 3 1 7 2.5 9 3 13.5 4.5 20 6.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 80 4 1.5 9 3 12 4 18.5 6 27 8.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 100 5 1.5 11.5 3.5 15 5 23 7 33.5 10.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46 150 7.5 2.5 17.5 5.5 23 7 34.5 11 49.5 15.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 200 10 3 23 7.5 30 10 45.5 14.5 66.5 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76 250 12 4 28.5 9 38 12 57 18 83 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consideration for wells which require a large amount of hypochlorite:
Wells which require more then 15 liters of liquid hypochlorite should repeat the mixing and addition procedure by preparing a tank of disinfectant for each 15 liters required.
Wells which require more then 15 cups of powdered hypochlorite should repeat the procedure for each 15 cups required. This procedure is necessary to properly place the disinfectant in the borehole and provide for disbursement throughout the well and surrounding formation.
**Large diameter wells**

<table>
<thead>
<tr>
<th>Approximate Depth of Water</th>
<th>Diameter 18” or 45 cm</th>
<th>Diameter 24” or 60 cm</th>
<th>Diameter 30” or 75 cm</th>
<th>Diameter 36” or 90 cm</th>
<th>Diameter 48” or 120 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meters Feet Liters Kilo</td>
<td>Liters Kilo</td>
<td>Liters Kilo</td>
<td>Liters Kilo</td>
<td>Liters Kilo</td>
<td>Liters Kilo</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>15</td>
<td>1.2</td>
<td>27</td>
<td>2.1</td>
</tr>
<tr>
<td>12</td>
<td>40</td>
<td>30</td>
<td>2.4</td>
<td>54</td>
<td>4.2</td>
</tr>
<tr>
<td>18</td>
<td>60</td>
<td>45</td>
<td>3.5</td>
<td>81</td>
<td>6.2</td>
</tr>
<tr>
<td>24</td>
<td>80</td>
<td>60</td>
<td>4.5</td>
<td>108</td>
<td>8.3</td>
</tr>
<tr>
<td>30</td>
<td>100</td>
<td>75</td>
<td>5.7</td>
<td>135</td>
<td>10.2</td>
</tr>
<tr>
<td>46</td>
<td>150</td>
<td>113</td>
<td>8.7</td>
<td>201</td>
<td>15.5</td>
</tr>
<tr>
<td>61</td>
<td>200</td>
<td>150</td>
<td>11.6</td>
<td>269</td>
<td>20.4</td>
</tr>
<tr>
<td>76</td>
<td>250</td>
<td>188</td>
<td>14.4</td>
<td>336</td>
<td>25.6</td>
</tr>
</tbody>
</table>

[1 cup = 0.25 kilogram approximately; 1 20-liter (5 gallon) pail = 20 kilograms approximately]

**Consideration for wells which require a large amount of hypochlorite:**

Wells which require more than 15 liters of liquid hypochlorite should repeat the mixing and addition procedure by preparing a tank of disinfectant for each 15 liters required.

Wells which require more than 5 kilograms of powdered hypochlorite should repeat the procedure for each 5 kilograms required or dilute the disinfectant at the same ratio in larger tanks if available. This procedure is necessary to properly place the disinfectant in the borehole and provide for disbursement throughout the well and surrounding formation.

---

**AGI and USGS Provide Unique Tsunami Disaster Relief**

ALEXANDRIA, VA – In light of the recent tsunami disaster in Indonesia and other parts of Asia, the U.S. Geological Survey (USGS), in cooperation with the American Geological Institute (AGI), is providing copies of the Global GIS DVD-ROM to U.S. Department of State-led teams traveling to Humanitarian Information Centers in affected areas.

The Global GIS, a large digital map database, provides datasets of historical seismicity, topography, geology, population density, roads, political boundaries, airfields and utility lines, among others. These datasets will benefit teams working in areas struck by the tsunami by supplying basic reference points for people working on the relief effort. The base maps are manageable at a nominal scale of 1:1 million and are easy to manipulate.

“It’s relatively low resolution, but it’s far better than any huge atlas you have on your shelf,” says Paul Hearn, a senior scientist with the USGS Regional Investigations Team, which has already sent copies of the Global GIS DVD-ROM to the Department of State. AGI, who through a development CRADA with the USGS helped complete the DVD-ROM and provides distribution of the database, is providing additional copies to the USGS as part of the relief effort.

“It’s useful for strategic work,” Hearn says, pointing out that the database is convenient because users can load it onto a laptop and zoom in on particular crisis areas to see a detailed view of the region. Thus, the disaster-relief teams can take the reference directly into the field and manage the data without having to access individual maps, books, or online archives.


**Press Release - January 14, 2005**
Laura Stafford - ljs@agiweb.org

www.aipg.org
The President’s Message

Robert G. Font, CPG-03953

Dear friends and colleagues:

As you know by now, one of my primary goals as National President in 2005 is to find ways in which we may strengthen the practical value of the CPG title. I will dedicate this “President’s Message” to this particular issue.

I am sure that we all agree that there is no dispute about the honor that it is to hold the title of “Certified Professional Geologist.” It is safe to state that we are all proud of our “CPG” designation. After all, the CPG is a title that we earn after rigorous evaluation by our own peers, who then endorse us by recognizing our credentials, experience, accomplishments and professional ethics. It is a title that should be desirable by all practicing professional geologists.

Realistically, however, we all know that the CPG title must be more than just an “honor” for it to continue to have its appeal. In specific, in order to attract new and maintain existing members at the CPG level, we should do what we can to make the title translate into better compensation for those who have it and/or better opportunities for jobs, promotion and advancement for those who hold it. It is my strong opinion that, unless we make the CPG title more practical, it will eventually weaken and lose its prestige. I am determined not to let this occur.

The challenge that we face is to convince new potential AIPG members (and even some currently “certified” members) that it is worth it to them to hold the CPG title. If the title does not give us an edge in procuring a job, securing a promotion or obtaining better compensation, what practical value does it have? These issues are becoming most critical, especially in states where registration of geoscientists has taken root.

How, then, do we continue to promote the importance and value of the CPG title? Strengthening the practicality of the CPG title constitutes one of the critical goals of our institute.

Efforts to Date

One basic problem that I have recognized for some time has to do with the fact that most people who hire geologists in the business world have no idea as to who we are in the AIPG and of the attributes that a CPG brings to the table. In my opinion, it is imperative that we do a better job of promoting the AIPG and the importance of the CPG title throughout the corporate world. In addition, we must enhance the membership benefits that we offer, especially as these apply to our “certified” members.

Promoting the CPG Title: One thought I had in 2004 is for the AIPG, upon a CPG’s request, to write a “letter of introduction” on behalf of that member. A key purpose of this letter would be to promote the AIPG throughout the corporate world and to highlight the attributes that a “Certified Professional Geologist” brings to an employer. At this time, we are reviewing this process and will assess the viability of its implementation.

A second front involves the internal promotion of the CPG title among our existing members and potential new members. To this end, I emphasize the relationship that I see between the CPG title and the continuing professional development (CPD) program that we are implementing. In my judgment, the fulfillment of CPD requirements will do nothing but strengthen the practical value of our CPG title. In my view, this has been long overdue. However, I also believe that from the moment that we start promoting and, at some point in the future, even demanding the fulfillment of these requirements, we assume a major responsibility toward that end. One way that we can begin to fulfill that responsibility is through the development and accreditation of online courses. This would also provide us with an additional source of income for our institute that is above and beyond what we can collect from membership dues.

So, as I see it, both the development of online courses and the fulfillment of CPD requirements are a very important part of our future in the AIPG and ways in which to strengthen the significance of the CPG title.

Concerning online offerings, we are making much progress. Over the past few years Dean and Professor, Dr. Detlev Doherr of the University of Offenburg in Germany and I have cooperated to establish a system of online instruction to serve both the AIPG and the EFG. Detlev concentrated on the computer side of the issue, while I worked on a prototype course (i.e. the “Introduction to Landslides and Mass Wasting” course that I have developed). As it now stands, the AIPG has procured an elegant and versatile system of online instruction, which is LINUX based, for a very reasonable and relatively modest investment. This will, undoubtedly, be attractive to our CPG members participating in the CPD program and to all geoscientists, in general.

The topic of the CPD program and online instruction will be the subject of my “President’s Message” in the next TPG.

Enhancing Membership Benefits: Regarding membership services, it is my intention to make the CPD quest worthwhile and attractive to all involved and, particularly, to CPG members. To achieve this, I have already formally proposed to our Executive Committee the implementation of discounts for our CPG members that participate and fulfill the CPD requirements prescribed.
PRESIDENT’S MESSAGE (continued)

in our program. I would like to see discounts applied to annual membership dues, registration to the annual national meeting, the purchase of publications from the AIPG, the purchase of any promotional item from the AIPG and fees or tuition for any future AIPG-sponsored online course. If we do this, we bring “practicality” to the CPD program and give our CPG title holders a tangible incentive to participate.

What Needs to be Done

I have recently formed a committee, whose charge is to find, define and outline ways and procedures that we should implement at the national level to strengthen the “practicality” of the CPG title. I asked seven outstanding members of our institute to take on this responsibility. They include Chair MB Kumar from Louisiana, Jim Shotwell from Texas, John Hofer from Tennessee, Barbara Murphy from Arizona, Mark Sweatman from Michigan, Todd Church from Virginia, Allen Sunderman from Minnesota, and Mark Rogers from Hawaii. These committee members can bring critical viewpoints from both states where registration now exists or where it is not in place. This will allow us to come up with strategies to better service our membership, regardless of what the registration situation happens to be. I have asked the committee to accomplish the following:

- Interact with one another and define concrete steps that the AIPG should take, at the national level, to strengthen the practical value of the CPG title.
- Poll their own Sections and communicate with AIPG members-at-large to factor in their input into their specific recommendations.
- Submit a final report on the subject by May 1, 2005.

I see the contribution of this committee as monumental to the future direction of the institute that we are all so proud of belonging to. The CPG title has always been the flagship that defines the identity of our prestigious membership. It is critical that we find ways in which to strengthen the practicality of the title, so that it will remain a coveted goal among practicing geoscience professionals everywhere.

Reflections on a Geologic Career

This fourth electronic edition of Reflections on a Geologic Career expands on the original edition prepared after the Colorado Section’s Student Day in 1996. It includes papers in the handouts distributed during the Student Days hosted by the Arizona and Colorado Sections in the fall of 1998. The oral origin of the papers is obvious and generally makes them easier to read. This electronic edition is to ensure wide distribution and use by students everywhere. Copy freely as long as proper referencing and acknowledgments are made.

Go to the AIPG National Website <www.aipg.org> and click on Publications in the top right drop down menu.

JOBS TARGET

A service provided by AIPG

Post a Job

Why post your job with American Institute of Professional Geologists (AIPG)?

Key Benefits

Targeted Reach: Our target-specific audience produces just the candidates you are seeking and gives your ad exposure to the highest quality active and passive job seekers.

Complete Control: There are no deadlines to adhere to, no size restrictions for your ad, and you have 24 hour access to make changes to your posting.

Cost Benefits: Posting your ad with us comes at a fraction of the cost of posting it with newspapers or the large online job boards.

Post a Single Opening

- AIPG Members Only: $10.00 - 180 Days
- Associated/Sister Societies & Members: $10.00 - 90 Days
- AIPG Corporate Members: $10.00 - 180 Days
- Other Organizations: $50.00 - 90 Days
- Other Organizations: $75.00 - 180 Days

Go to the AIPG National web site www.aipg.org
After watching election day in Iraq unfold, as people opened their doors early, peered out into the violence charged atmosphere and slowly, as the morning progressed, moved towards the voting stations in greater and greater numbers, most of us were struck by the total courage of these people just to make the journey. Even more impressive were the poll workers, who had to hide their identity from even their family members, lest they be targeted by the terrorists. It made my own first time experience as a poll watcher in our last election seem a bit tame in comparison.

I was not motivated by such noble goals to be a poll watcher. Nevada was one of eighteen so-called battleground states and our ears were pummeled by political advertisements, to the point where most Nevadans just tuned them out. Until about three weeks before the November election, I had intended to vote in early voting, which Nevada allows, and spend election day at work. My motivation was provided by parking, or more to the point, the lack of it. Our office building has 33 parking places, more than enough for the employees and clients who use them. Most of the time there are less than 10 spaces used. In early November, one of the secretaries from upstairs complained to me that she could not park in our lot because of all the cars. Occasionally, we get Kinko’s customers, but that usually involves only a few vehicles and they do not stick around. These cars were parked all day; moreover, they were all from out-of-state. Over the next week, and despite notices on windshields, we were unable to make any impact on removal. The situation deteriorated when we called towing to start removing the cars. One of the offending vehicles actually took a run at the tow-truck driver, but eventually we got the problem solved. It was only later that we found that MoveOn.Org had opened a temporary office up the street.

I have heard that when one’s home is burglarized, there is a feeling of being violated and, feeling somewhat like that, I called Republican headquarters and volunteered. What followed was rather perfunctory; with several other volunteers, I took a one hour course given by two lawyers on the do’s and don’ts of what to do on election day (do show up at 6:30 A.M., do not talk to voters within 100 feet of the polling station and observe if others do). We also had to call into an 800 number every hour to report vote percentages.

On election day morning, there was already a line of over 100 people before the polls opened and the wait to vote held study at about 45 minutes all day. My fellow Democrat poll watcher and I were outnumbered 6 to 1 by the number of young California activists, mostly Berkeley law students, who cruised in and out, looking for signs of voter fraud in the form of minority disenfranchisement. Our primary job, as poll watchers, was to challenge provisional ballots, observe people who had registered at another polling station and assist those voters who could not read the ballot, if asked by the election clerk. What we saw was what you might expect; almost nothing to report in the 14 hours we were there, except that Nevadans were turning out in good numbers. Mostly what the poll watchers were doing was watching each other, and occasionally getting in the way of the volunteers who were the real heroes of the day.

At 7:00 P.M. the polls closed. At 7:15 P.M., the election clerk collapsed on the floor. I thought she was going to die; she was purple and her legs were drumming. The fire department was called, but after some oxygen treatment, she recovered and stayed to finish the count. Courage comes in many forms, whether you are dodging bullets or counting ballots. I remain humbled by what democracy means to us all.

www.aipg.org
An interesting question has arisen regarding an aspect of one of the AIPG goals—the career advancement of members by advertising job openings for the benefit of AIPG members. A few months ago, a member sent an inquiry to Ethics Committee Chairman David Abbott about the implications of advertising professional geology position openings in the respective section newsletter. The question specifically asked whether a breach of ethics occurs when an AIPG vehicle (i.e., newsletter) includes job opening listings. The underlying implication of the question is whether by advertising position openings AIPG pits one member against another by encouraging employees to “defect” by seeking to accept a position with a different employer than the current.

Interesting question and, I know, one which will elicit varying perspectives. As to the ethics of it all, I will leave that discussion to David Abbott’s column. The question specifically asked whether a breach of ethics occurs when an AIPG vehicle (i.e., newsletter) includes job opening listings. The underlying implication of the question is whether by advertising position openings AIPG pits one member against another by encouraging employees to “defect” by seeking to accept a position with a different employer than the current.

Interesting question and, I know, one which will elicit varying perspectives. As to the ethics of it all, I will leave that discussion to David Abbott’s column. I wish instead to bring your attention back to the AIPG objective of improving professional situations for members by providing as much information as possible about the marketplace, including current job openings.

AIPG and the Executive Committee have always supported the use of AIPG’s resources to provide all members with access to as much useful information about career opportunities and job openings as possible. As the AIPG website became more versatile (thanks largely to the diligence and creativity of Wendy Davidson and Cathy O’Keefe), AIPG has been able to provide more information through the website, including JobTarget.

JobTarget has been effective both for geologists seeking employment and for employers seeking geologists. The benefit costs nothing for those wishing to post resumes and a small fee for companies recruiting new staff. If there is a negative aspect to the JobTarget benefit, it’s the difficulty in advertising its availability to a sufficiently broad audience.

The question of ethical breach alluded to in the first paragraph seems to be moot. After all, what is the point in professional networking if not to stay abreast of your profession? Staying up-to-date implies staying current not only with respect to technology, but also with respect to what your colleagues are doing, what corporations are doing (or not doing), and generally keeping an eye on market conditions, including job opportunities. Would not AIPG be more than a little delinquent if it did not provide as much information to its members as it is able to provide?

Inasmuch as AIPG can be of service to all its members by advertising job openings, it does not imply that AIPG is attempting to entice anyone to abandon a present employer. Likewise, AIPG has the obligation of informing its membership. Over and above, AIPG is expected to facilitate job seeking on behalf of interested members. Very often, members say they would like AIPG to do more. Every member’s opinion is valued.

Maybe the question about advertising professional jobs is worth discussing, perhaps not. Open exchange of opportunity announcements as they are available surely cannot be a negative for AIPG. Members are welcome to use the information provided through AIPG, or not.

### Test Your Knowledge

Questions for this issue are:

1. Microscopic examination of a red clay in north central Texas lying in proximity to the unconformity between the Pennsylvanian and Cretaceous strata yields the presence of abundant specimens of the charophyte *Atopochara trivolvis*. What does this tell us about the red clay?
   
   a) It is a fresh water deposit of Lower Cretaceous age.
   b) It is a marine deposit of Lower Cretaceous age.
   c) It is a fresh water deposit of Pennsylvanian age.
   d) It is a marine deposit of unknown age.
   e) It is a classic pedalfer.

2. For a non-rotating spherical Earth of mass $M_e$ and radius $r_e$ whose density varies only as a function of distance from its center, the equation of the geoid “$u$” is:
   
   a) $u = GM_e/r_e^2$
   b) $u = GM_e/r_e$
   c) $u = GM_e r_e^2$
   d) $u = GM_e r_e$
   e) None of the above.

Answers on page 25.
GIS Metadata Differs from Word-Processing Metadata

Milton Wiltse, CPG, called to ask if I or AIPG had any positions on the use and retention of the metadata used in GIS files. I was unaware that GIS software uses metadata to capture information about the data sources used in compiling the GIS output, such things as the scale at which the data was compiled, the types of manipulations that have been run on the data, etc. Wiltse believes that GIS files should contain and retain all the metadata relating to any data used so that those using and checking the GIS files can verify the suitability of the data and for peer review.

Wiltse wrote, “Some of the problems that have occurred to me are along the lines of data content quality with respect to what is displayed on a map, not just the quality of its spatial location, though that is certainly often an immediate concern. Geochemistry provides several good examples of potential problems. There is a structured opportunity in writing metadata that conforms to FGDC standards to, for example, include a history of the geochemical sampling methods, analytical methods, detection limits, etc. for geochemical data layers in a GIS presentation. This same data is usually included in any professional report, but electronic GIS files often part company with the written report. Attaching pertinent information to the files, at the least, preserves the relevance of the electronic data. It also provides users of the data with an immediately available source to consider when reviewing the maps from the perspective of whether the base data were sufficient to support ultimate conclusions reached from the analysis.”

Wiltse’s comments and reflection on the subject make clear that knowing the source of the data used in a GIS file is critical in resolving problems with such things as problems in the elevations of data points, etc. due to the scale of gridding used in the topographic or other contoured data. In addition, the reference geoids for the topographic data and the GPS unit used while collecting the geochemical data may differ. These resulting discrepancies between the data sets must be reconciled if the data is to be properly portrayed in the GIS file. The metadata in the GIS file allows those using the file to verify that these corrections were made and made appropriately.

I did not know about this type of metadata. The varieties of metadata I have discussed in previous columns, 61 (Jan. ’01), 90 (Mar. ’04), and 92 (July ’04), relate to the metadata in word-processing and similar files. While the word “metadata” applies to both the word-processing and GIS files because the data is contained in the file but is not displayed in the normal output on screen or from a printer, the character of the metadata is distinctly different. In the word-processing file case, the metadata is what allows the “undo” function to work and relates primarily to text editing, etc. This type of data need not be retained because what is important is the final draft and verification of the conclusions does not depend on knowing the edits. The metadata in GIS files does not relate to editing in the same way; it is a method of tracking and verifying the original data sets. Thus the GIS metadata should be retained in the file. Preparing a separate report of the metadata may be appropriate, but invariably separated documents become separated in fact. Retention of the metadata within the GIS data file avoids this problem.

Those having experience with this and other types of metadata, are encouraged to share their experiences and opinions on this topic.

Conflict of Interest—Bidding on Previously Recommended Work (Column ’95, Jan-Feb ’05)

I received the following comments on this topic in the last issue of the PE&P column. Ron Yarbrough, CPG, wrote, “If a geologist did the soils field work, lab work and wrote the report—under the law they could not do the design because a PE or SE have legal rights to this type of work. I see no reason that the geologist could not bid on the job of overseeing the construction. In fact, it may be a good idea, because as excavation continues he or she may see something that they missed (one never has enough subsurface data). As to your last question—many firms work in the same area for years. Maybe they even published materials on some of their work. Why should they not bid on additional work in an area which they know so well. The good news is they may be able to save some money for their client.”

Fred Fox, CPG, commented, “There is absolutely nothing wrong with recommending follow-up work to a consultant’s original report (assuming that it is a viable recommendation). It is, in fact, an excellent recommendation, rather than a conflict of interest. Lots of projects run in phases. Further, why would anybody question his qualifications for doing further work? And why should he forgo the opportunity to propose/bid on it? After all, he would be uniquely qualified to do a better job since he is familiar with the project and its conditions and aims. Having unique knowledge of the site is an asset and should not be a liability. I have been at the wrong end of that type of thinking at least twice in my career, and have been prevented from doing the substantial follow-up work found necessary by my own excellent preliminary work, and have felt cheated in both cases. In both cases, the work was done by others and, in spite of the ‘precautions’ taken by excluding me from doing further work by lawyers fearing possible conflict-of-interest, the follow-ups cost a small fortune and the clients were ill-served (one was a totally incompetent job done by a prestigious firm that required substantial additional work by yet another consultant to clear up the mess—we are talking over a million dollars here). In both cases I could have done the work in a fraction of the time for a small fraction of the cost, and done a significantly better job. This whole thing about conflict of interest has gone way too far. The only people benefiting are the lawyers and their minions.”

www.aipg.org
Mike Ruddy, CPG, who submitted the original situation, provided the following additional background information on the particular case, “The Consultant was paid/hired to prepare this ‘routine’ soils report which should include a summary, standard operating procedures and/or ASTM methodologies, and data analysis and report. If I were the client, I would not use this geotechnical consultant based upon their recommendation that includes them. My question is how does the client perceive this? Do they trust the preliminary work from this consultant enough to have another consultant either re-do the soils report for comparison, and subsequently what is recommended? I see a fine line that does breach ‘conflict of interest’ in this case. If the consultant did not include themselves for the next phase of work, then all is well. If the consultant recommended the follow-up work, but did not promote themselves, this is well also. But, this is not the case since they did recommend/promoted their extended services. They should have submitted the work they were contracted to perform, perhaps recommendations and conclusions with hopes they might be asked to submit a bid or be included as per the clients options. I do not feel that they had the client’s best interest in mind, only their own. We all have to market our services in this myriad of professions, but we do it ethically, professionally, and according to by-laws, period. Self promotion in this regard undermines the client’s integrity, compliance applications and finances. This form of self promotion is a slap in the face of our profession.”

As Ruddy’s additional information about the case triggering this discussion points out, “the devil’s in the details.” Does this additional information alter your view of the case? Please contribute your thoughts.

Should AIPG and its Sections Advertise Jobs in Newsletters, E-mail Lists, etc.?

The Virginia Section’s Newsletter contained the following item in its review of the November Section Executive Committee Meeting, “John Allan [VA Section Newsletter Editor] mentioned that he had received a negative feedback about advertising jobs in the newsletter. The individual was afraid that because of this sort of advertisement that someone may leave his company. John suggested that this individual come to the meeting and offer his thoughts. After some discussion it was decided to continue advertising jobs in the newsletter.”

The concerned individual passed his concern on to me stating, “I don’t like the fact that newsletters solicit employees from others. I don’t mind the AIPG web site for job openings because the employee has to want a new job and go to the site unsolicited. A job posting in a magazine may entice someone to leave, even though the person was not planning too, just because he/she saw something they did not know about. I’m not trying to be difficult, but why should I as an employer encourage my employees to join the AIPG, if the organization promotes them to leave. The AIPG is to promote geology, not job hopping.”

The problem presented is conflicts of interest. Is AIPG creating a problem for employers by advertising jobs that their employees may take in one way or another (newsletters, websites, e-mail lists)? Providing a means of advertising available positions within AIPG can be viewed as providing members a service—a service both to those seeking employees and those looking for jobs. In times of low employment of geoscientists, any ads for jobs tend to be welcomed and encouraged. Seeking employees who are AIPG members is a means of seeking out those with desired qualities including AIPG membership.

The other side of the issue, as the person raising the issue pointed out, is the potential for enticing the currently employed to change jobs with the consequent negative impact on the present employer. But someone will only leave a position if they believe that the new position will be better than the current position. “Better” may be salary, working environment, type of work, location, etc. If the departing employee was dissatisfied with his or her current position, that dissatisfaction may be adversely affecting the current firm in some, perhaps subtle, way. If this is the case, then perhaps both the current employer and the departing employee are better off because of the departure. If the “better” is the result of something shared by many employees at the present firm, then the present firm may need to adjust whatever the “better” is to correct a problem.

Column 93 (Sept ’04) addresses the topic of conflicts of interest in switching jobs. While not directly addressing the question posed by ads in newsletters, it does touch on related issues. One observation from that column is pertinent, “Realistically, most people think about a job move for some time prior to making one. They will probably discuss the idea with close friends and colleagues in an increasingly specific manner as the decision to move on gets made. (Remember that sometimes, the result of looking around is deciding that you are better off where you are.)” I know this has been true for me.

I sent a summary of this topic to the Ethics Committee members to see what their reactions might be. Mike Ruddy, CPG, commented on the situation stating, “I believe that AIPG should continue to solicit job openings for many reasons. The TPG gains funds for publishing these openings which helps the organization financially. In addition, in terms of job turnover rates in our industry, it is nice to see AIPG posting position openings that some may never see if it were not for AIPG’s TPG. Our section’s website (Minnesota) posts positions open and positions filled. There is nothing wrong with this and if anything, I would encourage more postings. If the employer in question believes it ‘lures’ employees to look into the posted position, then that employer has not fulfilled it’s obligations to that employee. One does not start seeking a new job if they are comfortable and happy with their current employer. I do not see this as a conflict of interest when someone is trying to better their employment status, especially in today’s market when the potential employer(s) offer less travel and job stability that in turn, proves opposite soon after employment. AIPG should continue promoting our profession, for that is why we are in this organization. AIPG promotes members, individuals, not employers. More power to the individuals that gain a higher standard through AIPG’s job postings. They deserve it.” Fred Fox, CPG, replied that he did not see any problem with job ads on web sites either. This appears to be a situation in which most do not see the perceived conflict of interest as a problem. However, if you do see it as a problem, please let me know why.

Papers Given by Expert Witnesses Prior to Trial

I received the following question from a member, “I have just heard about
someone (an expert for a Plaintiff attorney) presenting a paper on a project at a national GSA meeting that is about to go to trial, and in such detail that there was no question where the project was located and what parties were involved.

Furthermore, I heard that the expert’s presentation (tables, graphs, etc.) came directly from his expert report submitted a few months before. His presentation also included and identified the Defendant’s expert and her data. My initial reaction to this situation was that such actions were: 1) professionally outrageous; 2) violated implied confidentiality covenants in the standards of care operating in our field; and 3) would likely contaminate the jury pool since it was likely that news of such a presentation would make it into the local press where the case was being tried.

Questions to you:

1. Based on almost 40 years of being a Professional Geologist, I did not know our associates did such things. Does not this present a number of ethical issues? Is there anything stated in ethics standards in either AIPG or other society standards or guidelines that would make this action professionally unacceptable?

2. Should not our professional societies issue statements that data, maps, reports, etc. that are part of pending litigation should not be presented in papers at professional meetings, and could serve as grounds for expulsion from the society?

3. Should a professional who does such a deed be admonished or chastised in some form or fashion by whatever professional society he or she belongs? There may also be a few matters of law that might have been violated but those are separate issues handled elsewhere.

The first question that came to me was whether the attorney for whom the expert who presented the paper knew about the presentation and had granted permission for its presentation. If not, there may have been a violation of the rules on client service and confidentiality. What do you think of this situation?

I passed the question on to the Ethics Committee for their comments. Mike Ruddy, CPG, “Right now, I assume the presentation was unknown by the attorney and that this is a serious violation of attorney/client privileges, misconduct in every sense of the word of our profession and the potential of huge liabilities for this to be accepted and presented at a GSA meeting/conference. If permission was granted, it should have been the pre-cursor of the presentation with signatures from the attorney, and the like. A good example: I have been with Scott Wolter (AIPG Minnesota Section Member) when he presented his analyses of concrete samples that failed when the terrorists flew the 757 into the Pentagon. All of the samples were sent to him immediately by FEMA to see what the heat and pressure of this catastrophe did to the concrete. In his presentations, he mentions several times and notes, permission from FEMA. Also, in his presentation, he is limited to what he can say, what he can not say and why. He is only presenting what FEMA and the Pentagon would like to have said, not what he can say, and what he can not say. If we are obligated to protect our profession and, our colleagues, good or bad, I would find it hard to believe that the Attorney that called upon this person, gave him/her permission to present such detailed and precise information. In this case, it appears that confidentiality was severely breached and action should ensue. If this person is a member of AIPG, in any standing, and the Attorney did not grant privileges, then this person should have all privileges and membership status with AIPG immediately terminated and the papers drawn up by an Attorney representing AIPG. GSA opened themselves up to huge liabilities. I do not expect AIPG to stand down, if this is the case.”

Fred Fox, CPG, wasted no words in his comment, “The person who would do such a thing is clearly unprofessional (let alone unethical) and should be treated as such. That person also should be sued. In my 50 years of practice, I never even thought I would hear of such a thing about anyone in my profession. A no-brainer, in more ways than one…”

Dave Lipson, CPG, responded to my question stating, “A key ethical question here is whether the expert released confidential information, and if such release of information is detrimental to the expert’s client. If so, this could potentially violate AIPG Code of Ethics Rule 3.2.1: ‘A Member shall not use, directly or indirectly, any confidential information obtained from or in the course of performing services for an employer or client in any way which is adverse or detrimental to the interests of the employer or client, except with the prior consent of the employer or client or when disclosure is required by law.’

“More information is needed to determine if the material released by the expert was confidential. If the expert report was submitted to the court prior to the GSA meeting, then the information in the report was already in the public domain and therefore no longer confidential unless ordered to remain confidential by the court. The opposing expert’s report might also have already been in the public domain at the time the expert attended the GSA meeting.”

“More information is also needed to determine if publishing the material at GSA was adverse or detrimental to the interests of the expert’s client. This will depend on the outcome of the trial. If the trial results in a favorable verdict for the expert’s client, then there may be no ethical problems. Conversely, if the verdict is detrimental to the expert’s client, then there may be a breach of ethics. Therefore, the expert’s actions may be considered by some to be risky.”

“However, the expert may have been instructed or retained by his client to publish non-confidential information for strategic reasons. So a good question would be, what if the client/attorney instructed or retained the expert to publish the data, maps, reports, etc. prior to or during trial? If such activity were grounds for expulsion from a professional society, then the expert truly would face an ethical dilemma.”

“While I don’t necessarily agree that the expert’s actions were wise in this scenario, I believe more information is needed to determine whether the expert was operating within AIPG’s Code of Ethics, including the expert’s contract, exact dates of publications (both expert reports and GSA presentations/publications), copies of the expert reports and GSA presentations/publications, the nature and content of communication between the expert and her/his client, and the outcome of the trial.”

“I do not think any changes to the AIPG Code of Ethics are warranted...”
regarding dissemination of what may appear to be sensitive or confidential material prior to or during trial, because there may be over-arching strategic or contractual reasons for undertaking such activities.”

Clearly, such a presentation by an expert witness can have significant ethical and professional consequences. As reflected in the preceding comments, there are circumstances where an expert witness can ethically make such a presentation and there are material facts about the case in question to which we do not currently have and which are needed to determine whether an ethical violation indeed occurred. I do not know who the expert making the presentation is, so I do not know about AIPG membership.

David M. Abbott, Jr., CPG-04570, 2266 Forest St., Denver, CO 80207, 303-394-0321, fax 303-394-0543, DMAgeol@msn.com

Topical Index to the Professional Ethics and Practices Columns

I have prepared a topical index covering columns that have been placed on the AIPG web site in the ethics section. The index is in PDF format. The original file is in Microsoft Excel format. If you would prefer the Excel file, send me an e-mail and I will send it to you. I will update this index periodically and post the new copy on the AIPG web site. If you have suggestions on organization, please let me know.

FREE RESUME POSTING
POST AND VIEW RESUMES FOR FREE ON THE AIPG NATIONAL WEBSITE
www.aipg.org
Click on Job Target.

AIPG Student Chapters

Wright State University
Founded in 1996
Chapter Sponsor: Thomas Berg, CPG-08208

James Madison University
Founded in 1998
Chapter Sponsor: W. Cullen Sherwood, CPG-02811

Colorado School of Mines
Founded 1999
Chapter Sponsor: Graham Closs, CPG-07288

Central Michigan University
Founded 2003
Chapter Sponsor: David J. Matty

Bowling Green University
Founded in 2004
Chapter Sponsor: Robert K. Vincent, MEM-0216

Ohio State University
Founded in 2004
Chapter Sponsor: Thomas Berg, CPG-08208

NEW AIPG STUDENT CHAPTER

Georgia State University
Founded 2005
Chapter Sponsor: Ronald J. Wallace, CPG-08153

Chapter Officers
President: Jeanette Truong
Vice President: Jennifer Fisher
Secretary: Bob Neurath
Treasurer: Kelly Carroll

Student Chapter Members
Dawn Bradley
Greg Gilmore
Donald Hardison
August Nelson
Julia Shackford
Jessica Turner

WELCOME!
MEASURING THE PROFESSION - COLUMN 8

Databases as an Archive of Personal Knowledge

Allen W. Hatheway, CPG-02426, Consulting Geological Engineer, Rolla, Missouri & Big Arm, Montana, Allen@Hatheway.net

The practice of geology never has been less than demanding and that is a fact that just about all of our readers would hardly argue to the negative. Think of the dimensions of knowledge that are now required for successful practice!

- Every site we visit for the purpose of gathering information and for rendering an opinion is different from the last site and it will be different from the next site;
- Most of the physical character of the earth materials subject to our visit and to our forthcoming observations, evaluations, interpretations, findings and conclusions are hidden from direct view;
- Even the ground surface of most of our sites are obscured by present construction or by vegetation;
- The absolute truths of our findings and conclusions will become better known only after completion of construction or whatever other land use has engaged our services, and;
- Many of our sites are subject to alterations in the behavior of their earth materials due to continual and/or step-function recurrences of episodic stability-altering natural events such as earthquakes, flooding and other natural phenomena.

**A NEED to GATHER and ASSEMBLE LEARNED KNOWLEDGE**

Considering these five confounding factors, is it any wonder that most of us have relatively large collections of reference literature and that we struggle to take notes of our observations, if only to grow “smarter” about what it is that we are able to see, to detect, and to anticipate?

It follows that the practice of geology surely is one of the higher orders of “call-[ing” in the professions. Consider that a “profession” is a lifelong commitment to learning and to the application of that learned knowledge, and you have reason to wonder how it is that any of us can direct our memories on just that accumulated knowledge needed to adequately deal with the next “site” upon which we will focus our attention.

My little secret here is my dedicated use of databases. There is nothing of consequence that I learn, on a daily basis, that I do not “park” in one of my databases.

**DATABASE, as defined by the author:** An orderly, searchable and retrievable accumulation of facts and observations identified by “key words” describing the nature of each data assemblage. In the modern sense of digital computation and word processing, the database has become the basis for personal archives of meaningful information, facts, numbers and dates brought together in associations of meaning to the professional scientist.”

Personal, fact-based databases are not only the key to survival as a gainfully employed geoscientist in today’s world, they can be used to extend your capabilities to meet real-earth site and waste characterization challenges and can give you the basis for rapid responses of findings, conclusions and recommendations that are superior to those of your competition.

**PREMISE of the DATABASE**

My rationale for indulging in the habit of data basing is that nobody’s memory is perfect and that our individual professional worth as geologists depends on our abilities to produce accurate, reproducible and timely work product. Carry that another step forward and we have to recognize that 21st century society is ruthlessly consumptive of employed professional scientists and engineers. Just as you approach the proven age at which “background, training and experience” should be highly valuable to your organization, the tendency is to replace you with younger and cheaper individuals. The database, however, hugely extends the individual’s productive career. Hand-in-hand with experience, the database provides new dimensions in dealing with our work challenges and it gives the additional bonus of representing a reliable key-word oriented basis for technical writing.

**BUILDING YOUR OWN DATABASE(S)**

Learning is a demanding and expensive process, especially in terms of access to points of learning. Books are expensive, society dues and journals are expensive, and gasoline and lodging to visit the field are expensive. Why not get the most out of each learning experience?

Frankly, I regard all knowledge (that is, fact and experience worth accumulating) to be valuable, and I do not trust such earned knowledge to my memory! The very exercise of detecting, observing and recording such knowledge is reinforcing of the learning process and often leads to secondary listings under other key words. In my scheme of database layout, these alternatives generally occur in the third of four database columns.

**Three-by-Five Cards**

When in graduate school at the University of Arizona, in 1965, I had the good fortune of taking a class in applied geomorphology, as taught by the venerable Professor (Dr.) Laurence Gould. Professor Gould would never be found without a pack of three-by-five
cards and he admitted to myself and a fellow student once that his successes as an impromptu lecturer in science came from his collection of these cards, from which he would grab a fistful for card shuffling, and thence be in control of an array of interesting facts for any event.

My own quest for ordering my personal knowledge

In fact, my own quest for recoverable information was grandly accelerated by Professor Gould’s practical example and, within ten years I was working in Massachusetts. In fact, in 1976, I had rediscovered three-by-five-inch cards and had just bought an antique oak card-file cabinet, said to have been discharged from the Cambridge, Massachusetts Public Library.

My cabinet had six rows of five drawers and I went at creating cards with a vengeance. My scheme was simple:

- One card per key word;
- Key word appeared in bold ink print at the upper left corner;
- Each card was dated on the upper right corner;
- Each item of information added was given a sequential number, from 1 (one) onward;
- When the reverse of the card was filled, I put a “down” arrow at the lower right of the card, each subsequent card having the same left-corner keyword and a sequential card number (upper right corner);
- Flipped over, the numbered entries continued, bottom-to-top;
- I forced myself to draw schematics and, also made reduced-scale facsimile copies of illustrations and taped them on, and;
- For every fact taken from some identifiable source, I added a good reference citation.

Using 3 x 5-inch Cards

Soon after starting my affliction with three-by-five cards, I started packing blank cards to lectures and to project meetings, in fact to any meeting at which I suspected I would hear something valuable in the application of geology.

Use in Teaching

As it turns out, I went off to the School of Mines & Metallurgy at the University of Missouri-Rolla, in August of 1981 and those cards could be used in preparation for classroom lectures! What a boon!

Setting up your database

Considering that the greatest use of a geologist’s database is to provide a giant extension to personal memory, I view databases as columnated repository of searchable, multi-dimensional facts. Not only does the database grow with time and personal experience, but it archives reliable and referenceable information for instant recovery. Just when each of us should be planning on avoiding society’s “bone pile” at age fifty, the database becomes a treasure from which writing can be based and upon which expert testimony can be formulated to take advantage of decades of experience.

It is my premise that geological technical information is most valuable when it can be associated with dates, places, keywords and narratives. In fact, my mind tends to associate all elements of data toward time and place. This viewpoint was established in my mind as a young Army officer (1961), when it became clear that military intelligence (“G-2”) consisted of the same essential elements of information that are so important to our own geological project work; who, what, why, when, and where.

Over the years, I have come to prefer the rank order of WHERE, (Columns 1 & 3) who or what (Column 3), and when, why, how, how many and other critical information coming along in Column 4. And as ascribed to General George Smith Patton, Jr., “Intelligence is like eggs, the fresher, the better.” I try to keep columns 1 through 3 as one-line each, but expand column four to many pages, with details. Here is a composite example of entries from various of my databases (Table 1).

Additional advantages of databases as fact repositories

A carefully designed database has three additional advantages to practicing geoscientists; it can be expanded, it can be sorted into groups, and it can be searched for names or terms within its body.

Potential expansion of the database

From my own experience, I know that standard, proven commercial database software are capable of great lengths. My own system has reached as much as 60 Mb of capacity and has not shown symptoms of slow function or other malfunctions.

Data Sorting

Database entries furthermore can be sorted out on command, by locations or keywords utilized in the individual single-row entries. Thus, the database can be line-entry sorted by whatever geographic (place name) affinities that you have assigned, or by various geologic, stratigraphic, lithological, structural or geomorphic terms that you have selected to characterize the individual data entries. My entries are always assigned a literature citation, personal field book date or page, or digital image or color slide identifier, for example.

This system search capacity in which all “hits”, based on a single-column search, can be sorted under several hierarchical choices. Additionally, words, short phrases and numbers can be searched for and highlighted, but most economically, in terms of wait time, only after a selection of single-column “hits” are sorted.

Name and terminology searching

Particularly helpful in compiling expert opinions and in technical writing in general, is the useful database capacity to search through sorted masses of databases, to locate corroborative or illustrative facts.
SOME SAMPLE ENTRIES FROM VARIOUS HATHEWAY DATABASES

<table>
<thead>
<tr>
<th>Location</th>
<th>Main Location</th>
<th>Keyword</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>Seismological Equipment</td>
<td>Vertical Strong Motion Recordings</td>
<td>2004: Recordings from a vertical strong motion array in the New Madrid seismic zone, by: Zhenming Wang, <a href="mailto:zmwang@uky.edu">zmwang@uky.edu</a>. First-ever results of earthquake ground motion recorded from a deep (260 m) vertical strong motion array in the New Madrid seismic zone. Small earthquake (Md2.5) at 11:58:38 (UTC) on October 21, 2004, triggered the VSAS array. Web poster shows the recordings from accelerometers at the surface, 30m, and 260m deep. <a href="http://www.uky.edu/KGS/geologichazards/strong-motion.htm">http://www.uky.edu/KGS/geologichazards/strong-motion.htm</a></td>
</tr>
<tr>
<td>U.S.</td>
<td>Toxicology</td>
<td>PAHs</td>
<td>2004: Summary of PAH Health Risks</td>
</tr>
<tr>
<td>U.S.</td>
<td>Personality</td>
<td>Dibblee, Tom W. Jr.</td>
<td>1992: Biography, by Dorothy L. Stout</td>
</tr>
<tr>
<td>Missouri</td>
<td>St. Louis 26</td>
<td>Carondelet Coke WKs</td>
<td>1914: Initiation of Sinkhole Tar Pond</td>
</tr>
<tr>
<td>New York</td>
<td>New York City – 125</td>
<td>Far Rockaway Gas Works</td>
<td>Pre-1909: Rockaway Park; AKA 325-347 Central Ave.; USEPA CERCLIS Site</td>
</tr>
<tr>
<td>Kansas</td>
<td>Kansas City</td>
<td>“Rubble Zone” (Burlington LS)</td>
<td>17Sep, 1988: Hatheway lessons learned from inspection of former J.A. Tobin Mine, below Forest View Landfill (Field Notes, p. 252 and photo images)</td>
</tr>
</tbody>
</table>

Summary

Give yourself a break and learn worthwhile facts, observations, and experiences only once! Reinforce the learning experience itself by ordering and parking the item in a database. The saved item will be waiting for you to call, and the software has the sort-and-search capabilities that will ring the door bell for you!

Allen Hatheway (allen@hatheway.net) is an early-retired Professor of Geological Engineering who has practiced for 44 years, in his native Los Angeles, and at San Francisco, Boston, and in Missouri. He has served his profession as a teacher, soldier, public servant, and consulting firm staff and partner. He is professionally licensed as Geologist and/or Engineer in several states (AZ, CA, MA, ME, and MO), but swears that his formal education has been strongly tempered in the School of Hard Knocks. He serves as one of AEG’s ambassadors to AIPG, as an Honorary Member (2002) and past-president of the former (1985). He and wife Dina split their time between Big Arm, Montana and Rolla, Missouri.

www.aipg.org
Client Relationship Management

Martin J. Andrejko, CPG-08512, Senior Underwriting Specialist, Architects & Engineers, One Liberty Plaza, 165 Broadway, 31st Floor, New York, NY 10006, 212-553-5628, Fax: 212-225-7038, martin.andrejko@zurichna.com

A couple of points brought up in David Abbott’s Professional Ethics and Practices – Column 95 from the January/February issue are going to be the basis of my column this month.

Delayed Report

The first section of David’s column was about a delayed report angering a client. In this case, the member had performed an aquifer test for a real estate developer. The report had not yet been completed due to the member working on projects for other clients. The member communicated with the client that the report would be delayed. The client eventually started to take an angry confrontational attitude with the member. If this were the old TV show “Lost in Space”, the robot would be flailing his arms yelling “Danger danger Will Robinson”. Let us look at why.

First is the type of client. As I had stated in Column #6, developers, in general, are one of the more litigious client types. Usually, they are heavily leveraged so any delays in a project are going to have direct financial impact on them. I am actually surprised that the developer in this case has not yet filed a claim. The member has taken some positive steps in that they have communicated the delay with the client. One of the key things in dealing with clients is maintaining and managing their expectations. As soon as you know you will not be able to meet the client’s expectations you need to be talking with that client informing them of the issue(s) and then formulating a plan to deal with the issues. It does not appear that the member took the step of formulating a plan to deal with the issues because the client has now become angry and confrontational.

In John Bachner’s book, “Practice Management for Design Professionals”, there is a list of symptoms or warning signs that indicate when there may be a problem with the client. One of the warning signs is “silence instead of dissatisfaction.” Initially, at least, it appears that the client did not react negatively to the news of the delay. It could be that the client is patient and understanding, although clients like this are rare. The client has chosen to be silent and stew over the fact that the report is late. Just because the client’s initial reaction was calm does not mean that the problem is solved or will go away. The report still has not been issued. Now the client is outwardly expressing their frustration. This leads to another of Bachner’s warning signs, “silence after dissatisfaction.” Just because the client is not continually nagging, does not mean that the problem is gone. The longer it takes to complete this report and issue it to the client, the more likely it is that the client will commence or threaten litigation. Even if it is ultimately found that there was no professional negligence on the part of the member, there are still going to be defense costs to be paid. Also, remember that the member will have to spend valuable time in defending the claim. This is not good as lack of time was what put the member in this position so he could find himself in a vicious circle.

In David’s article he states “the developer’s angry and confrontational attitude has taken the enjoyment out of the project for the member.” My response is “Too bad!!!” While we all wish that every project we are involved with brings us personal and professional enjoyment and fulfillment, it is not the client’s responsibility to fulfill that wish. We have all worked on projects that were less than enjoyable. One of my favorites was doing liner inspection on a new landfill cell adjacent to the active face of the landfill. Besides the smell, there was not a whole lot of enjoyment when gulls overhead are pelting you with droppings or bones or other refuse that they lost their grip on.

David also correctly points out the impact of an unhappy client—the ability to obtain future work. It is unlikely that this client will use the member for any subsequent projects. In addition, the member now has a disgruntled former client out there who may decide to let everyone know what a bad job the member did. No company is perfect and it is in the handling of a problem where a company can either help or hurt their reputation. A service provider that appears indifferent to the needs of the clients and does not respond to the client’s concerns is going to get a bad name. But a firm that does respond appropriately to client concerns and addresses any problems is likely to have earned a client for life.

Perceived Conflict of Interest

The second part of David’s column that was of interest dealt with the question of conflict of interest when a geotechnical consultant prepares an investigation report and includes recommendations for follow-up and oversight during construction. As long as the recommendations are technically sound and appropriate then I would see no problem in allowing that firm to bid on the additionally recommended work. The desire of the geotechnical consultant to pursue the construction oversight is also a good risk management practice. Being involved with the construction oversight gives the consultant a better level of control in terms of being sure that their recommendations are being followed. It also allows the consultant to be able to make changes in their design.
**PROFESSIONAL LIABILITY AND RISK MANAGEMENT – COLUMN 8**

should unexpected conditions be encountered during the construction phase.

From the client’s standpoint, it makes good sense to use the same firm because that firm already knows the site. I worked on a project in central Pennsylvania where we had done the foundation investigation and design in a karst area. A portion of the building was going to be on spread footings due to the competency of the rock and the remaining portion of the building was going to be put on mini-piles due to the depth to rock and the general competency of the rock. Our final report recommended that construction oversight was going to be critical in deciding how deep to place the mini-piles. The client agreed that oversight was needed but hired a local firm to do the work, primarily on price. Two days into the mini-pile drilling process, the local firm realized that they were in over their head and recommended that the owner should contact the original engineering firm. It was clear, based on the conditions discovered during construction, that the condition of the rock varied dramatically even within a pile group. My firm had several field personnel active during the installation of the mini-piles to confirm conformance with the design specification. The local firm took an intelligent approach to this project. Their personnel realized that they were out of their element with the mini-piles to confirm conformance to the design specification. The local firm continued to work on other aspects of the project such as backfill monitoring and concrete test cylinder collection. Had they continued to work on the mini-piles, it is likely that there would have been problems with the building foundation that would have generated a claim.

Send comments to: Martin Andrejko, Zurich North America, One Liberty Plaza, 165 Broadway, 31st Floor, New York, NY 10006, e-mail: martin.andrejko@zurichna.com.

---

**Answers to Questions on Page 16**

1. The answer is (a), a fresh water deposit of Lower Cretaceous age. Fossil charophytes are basically the oogonia of calcareous fresh water algae. *Atopochara trivolvis* happens to be an “index” fossil for the Lower Cretaceous Aptian stage.

2. The answer is choice (b) or $u = GM/r_e$, as proven below.

According to Sir Isaac Newton’s gravitational formula, a force of attraction exists between any two masses. This force is directly proportional to the product of the masses and inversely proportional to the square of the distance between them. Thus,

$$F = \frac{G M_1 M_2}{r^2}$$

From Newton’s second law of motion (force equals mass times acceleration) we can say:

$$F = M a$$

$$a = \frac{GM_1 M_2}{r^2}$$

where $g$ is the acceleration of gravity.

Basically, “$g$” is the acceleration experienced at $M_1$ due to the influence of $M_2$ when both are separated by a distance $r$. If $M_1$ is a point unit mass and $M_2$ is the mass of the Earth ($M_e$), then:

$$g = \frac{M_e}{r_e^2}$$

where $r_e$ is the Earth’s radius.

Thus,

$$g = \frac{GM_e}{r_e^2}$$

describes the acceleration of gravity for a spherical earth whose density varies only as a function of distance from its center and where $M_e$ is the mass of the Earth and $r_e$ is its radius. For this model of the Earth, gravity would be directed toward its center and perpendicular to its surface, an “equipotential” surface called the “geoid.”

Mathematically, “$g$” is a vector function that is the gradient of a scalar function:

$$g = - \nabla u$$

where “$u$” is the geoid. In other words, “$g$” is everywhere perpendicular to the equipotential surface defined by “$u$” (where “$u$” satisfies Laplace’s equation $\nabla^2 u = \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}$).

To find the value of “$u$” for a non-rotating, spherical Earth whose density varies only as a function of distance from its center we must integrate:

$$u = \int g \, dr$$

$$u = \int \frac{GM_e}{r_e^2} \, dr$$

$$u = GM_e \left(\frac{1}{r_e} - \frac{1}{r}\right)$$

$$u = \frac{GM_e}{r_e}$$

Thus, $u = \frac{GM_e}{r_e}$ is the answer to our question.

Now, the geoid for a spherical rotating Earth is:

$$u = GM/r + \omega^2 r^2 \cos^2 \theta/2$$

where $\omega$ is angular velocity and $\theta$ is latitude.

And the geoid for an Earth shaped as a rotating oblate ellipsoid is:

$$u = GM/r + (GMa^2/2\omega^2)J_2(1-3\sin^2 \theta) + (\omega^2 r^2 \cos^2 \theta +...)$$

where $a$ is equatorial radius and $J_2$ a dimensionless coefficient. In other words, $u$ may be expressed as a series of powers of $(1/r)$ with coefficients which are spherical harmonics (functions of latitude and longitude). In the last equation, the term containing the $J_2$ coefficient gives the oblate ellipsoid form to the geoid. The third harmonic with coefficient $J_2$ defines a “pear-shaped” Earth, and so on.
STUDENT’S VOICE - COLUMN 7

Prepared for a Prospective Employer?

Tristan H. Jones, SA-0433

As a student in the geological sciences you learn basic skills of mapping, mineral identification, rock formation and earth processes. You usually experience working on a research project, and some students gain experience writing grant proposals and other funding requests. All of this preparation is done in order to develop the skills that will give you an edge over the hundreds of other people also entering the work force.

Even after all of this education, soon after beginning a new job the learning process starts anew. On the job training, training required to meet government safety regulations and job-specific training are just some of the things that can be encountered soon after accepting a new position. Generally this all takes place outside the university setting. The continued training can end up costing a significant amount for the employer, both in training costs, and in lost productivity from a new employee who spends his or her initial time in training sessions instead of working.

What types of things might students do to make themselves better prepared for a prospective employer? If a student knew in advance what types of skills and qualifications they needed, but might not currently have, they could incorporate them into their educational plans. Generally this all takes place outside the university setting. The continued training can end up costing a significant amount for the employer, both in training costs, and in lost productivity from a new employee who spends his or her initial time in training sessions instead of working.

What types of things might students do to make themselves better prepared for a prospective employer? If a student knew in advance what types of skills and qualifications they needed, but might not currently have, they could incorporate them into their educational plans. Generally this all takes place outside the university setting. The continued training can end up costing a significant amount for the employer, both in training costs, and in lost productivity from a new employee who spends his or her initial time in training sessions instead of working.

I encourage professionals in the area to meet with the local student chapter if one is available. An invitation can be extended inviting them to a state section meeting. A few volunteers willing to attend one of the student chapter’s meetings is also beneficial. This offers an informal, low stress environment for students to ask questions in, and is an especially good way to attract new members too.

If there were more that students could do to gain that “edge,” would it be more training? More classes? More experience? What is that one thing that professionals and employers wish that their entry-level employees already knew or had experience with before they were hired? With its many varied resources and members, it is a question that might be answered in an organization such as AIPG.

I encourage members who may have a suggestion on this topic to contact me. In the future the topic can be revisited and I will attempt to highlight the results. Hopefully it will help to provide better-qualified and prepared applicants for employers, and more opportunities to get ahead for students.

Tristan Jones can be contacted at jones1th@cmich.edu.

START AN AIPG STUDENT CHAPTER TODAY!

AIPG STUDENT CHAPTER MANUAL
www.aipg.org

The AIPG Student Chapter Manual is available on the AIPG National Website at www.aipg.org or contact National Headquarters at (303) 412-6205.
Nancy Price, SA-0382

One day, while on winter break, I went to the bank to deposit a check in my account. Once at the desk, there arose a situation where the bank teller had to find the difference between a previous balance and an adjusted one. The teller stared in frustration at the paper for a good number of seconds before she looked up and said that it was too hard for her to figure out. I was flabbergasted. How could a person who more than likely made it out of elementary school a long time ago not know how to add and subtract two simple numbers and why is this person working at a bank? In actuality, it is not that the teller had never learned simple arithmetic, it is rather from disuse and reliance on calculators over time that the skill was lost.

Any student knows that the moment a class has ended is the very moment that a person begins to forget what they have learned. For some academic disciplines this is not that big of a problem, since specialization may not require keeping in mind every aspect of every subject that was learned. For geology students, however, it can be a problem. Geology is a subject that is intimately connected to many other subjects, including elementary chemistry, physics, and calculus. In order to understand more complex ideas in geology or in order to figure out complex problems, a student must have a good background in the introductory sciences. It still astounds me that some people in college have forgotten how to complete simple trigonometry problems or do not know what the symbols in a mineral’s chemical formula mean. If a student can not remember the basics of science, then how could an employer or future advisor expect them to remember and apply the concepts in geology?

The first obstacle to overcome is the dangerous, yet often conceived notion that a subject or class is an experience unto itself. When a student takes a class he or she may immerse himself or herself in the material and over the course of the semester become a true expert on the subject. Then, when the class ends, the student makes the mistake of letting go of the class and putting the knowledge on the proverbial shelf like a once read book sitting among a library’s collection. This should never be so for what is left unused is lost. It is, therefore, imperative to actively maintain what has already been learned, to keep it fresh in the mind instead, like a book of reference on a desk, so that it isn’t lost and ultimately forgotten.

Idealism aside, I realize that this is not an easy task. Students barely have enough time to handle the material in their current classes without the added pressure of maintaining what was learned in previous classes. Yet, if a student is mindful and takes responsibility for what they are learning, then it is possible with a little diligence to keep the knowledge fresh in mind long after the class is over. Here are some of my suggestions:

**Make up Study Sheets**

Making a sheet of all the themes or main points of a class can be a good way of providing a place to go when the need arises to later reference the material covered in that class. Since you have already spent the time learning the concepts, these sheets need only be a quick reminder to keep the ideas fresh in your mind long after the class is over. These are best compiled during finals so that they can also serve as an impetus to study. (Also AGI data sheets are a good example of a source of reference if you have not managed to create your own).

**Audit a Previously Taken Course**

For many students, myself included, taking a class just once is not enough to learn and understand the subject matter fully. Sometimes it takes learning it a second time to really grasp the material. For these people I suggest auditing the class again if school policy and time allow it. This is a good course of action for those classes that you may have passed but never really fully understood. While in the class, you can also serve as a source of information for other students taking the course for the first time, which can also help boost your understanding of the material.

**Serve as a Teaching Assistant or Tutor**

Teaching others is a good way to refresh a topic in your own mind because you have to be able to think of ways

www.aipg.org
of relating the unfamiliar material to another person. Because of this, you may in the end understand the material better than when you had learned it in the first place.

Try to Relate Your Current Work to Previous Studies

The world does not operate in a vacuum and, therefore, neither should your studies. Try to find ways to relate what you have learned in previous classes to what you may be currently learning. If you are working with a calculus-based equation, look into how it was derived. If you are investigating thin sections of metamorphic rocks, think of what structural mechanisms could have acted upon those rocks to produce the patterns of minerals that you see. If you are learning about equilibrium in a rock system, think about the principles in chemistry that relate to or govern that. By always trying to relate previously learned concepts to new ideas, you will always keep them fresh in your mind no matter what you may be currently learning.

Read Further

A good way to keep concepts in your mind is to apply them. Reading professional papers and other publications actively can allow you to apply what you already learned to a real life situation. In many cases, they may even be at a level that is over your head, but by thinking about them critically you can better understand how a theoretical idea might actually be applied. It brings them out of the classroom and into reality. Also, by studying the history of subject, theory, or process, you can gain a better appreciation for how it was conceived and developed.

In the end, all of these methods touch upon the idea that you do not become educated by simply sitting in a chair and mindlessly absorbing what is taught to you. In any single class, you only touch upon the surface of what can be learned about a subject. The professor opens the door for you and it is your responsibility as a student to not only look at what is there but to walk through and explore as well. From this, a student should develop a repertoire of knowledge that each class only adds to. By taking an active role in what you learn, you can develop the ability to think critically and formulate your own ideas. Such a skill will make you invaluable as an employee or as a future researcher and will make learning a much more rewarding experience in your life.

If you have any ideas, questions, or comments about this article, the upcoming article, or any other issues, please feel free to contact me via email at: small_fzy_mamml@yahoo.com. Next article: Field work and the Student.
Forensic Geology vs. Geologic Law

Bobby Timmons, CPG-02736

The articles and guidelines that have been written about how geologists should purport themselves in court in cooperation with legal representatives are legion. The American Institute of Professional Geologists' guide, The Professional Geologist as an Expert Witness, revised April 1994, is one of the first that comes to mind. Therefore, an article discussing the geologic approach as dictated by a geologist and recommended for lawyers seems long overdue. This is a different tack and one likely to raise the legal hackles, but it is nevertheless warranted.

Having had some experience in legal issues, it is time that a geologist outlines what lawyers should know or how they should approach a case where geologic expertise and truth should be sufficient to determine justice.

Competent, accurate, truthful geology should need no legal salad dressing to obtain a just decision. But experience has shown that legal shenanigans often have greater appeal to those whose names are followed by esquire.

I will avoid introducing any prejudice by citing my own experiences and instead consider the documented experience that follows. This should elucidate the need for attorneys to seek, listen to, and follow the advice of geologists in applicable situations.

The geologist, (identified with his permission at the end of this article), is a Ph.D. with excellent credentials and extensive field geology experience. He was engaged to determine the validity of a stone used as a property boundary marker. The case involved whether the stone, that both sides agreed was a boundary marker, had ever been moved, (perhaps as much as 100 years previously) or still existed in-situ.

The geologist was initially contacted by the landowner who described the dispute. He asked if the geologist could determine whether the stone had been moved and if he would agree to be involved in the case. This initial conversation involved a discussion of all the information available to the landowner regarding the marker stone. The geologist informed the landowner that his findings might not support the owner's viewpoint. The landowner and the geologist agreed during this conversation to meet on-site for an initial investigation.

The initial visit was cut short by a violent rain storm that necessitated a second visit by the geologist a few days later. The rain storm inadvertently exposed a much larger area of the marker stone. This facilitated a thorough and complete investigation. The second visit included the taking of photographs, rock composition comparisons with other nearby outcrops, fracture similarities and bedding plane continuities. These were all clues to the geologic truth.

Other clues such as vegetation, (mosses and lichens), very old chisel marks and faded paint were noted to support the geologic evidence.

The geologist’s findings were reported in both oral and written form to the landowner. A delay of approximately six months ensued before the landowner called again to ask the geologist if he would testify in court as to his findings.

Another site visit, suggested by the geologist, was made by the landowner and the geologist. This was done to explain to the landowner the visual and physical geology discovered by the geologist.

Finally, the case was heard before a judge.

However, prior to the trial, the geologist requested a session or two with the landowner’s attorney. He was informed that the attorney was very busy and he, the attorney, did not think it was necessary. As a consequence, the geologist entered into the court proceedings with no ideas as to the approach of the landowner’s attorney. And he was unable to coach the attorney on pertinent questions to be asked or ones he might expect from the opposition.

After two days of waiting in the witness room, the geologist was finally called to testify. The attorney asked the geologist if he had made a study of an alleged boundary marker without describing any location or other pertinent physical parameters. The attorney asked the geologist if he thought it was a fake rock. End of his questions.

The opposing attorney then began his questioning by asking, “How much are you being paid to get up here in this court and testify for your client?” (Does this ring a familiar bell?) The geologist responded that he was a paid consultant to testify to the geologic facts and was not testifying for anyone.

The opposing attorney then showed the geologist a small album of blurry, nondescript, Polaroid-type photographs and asked what they represented. The geologist answered that the photographs were of such poor quality that they precluded his making any comments as to subject matter. The geologist offered to show some of his good-quality photographs from the subject area only to be reminded by the judge to answer only the questions asked.

The opposing attorney finished his act by commenting that no man alive was capable of saying if a rock had been moved when it may have happened more than 100 years previously. There is no information available to the writer that the judge saw anything wrong with that statement!

At this point, the geologist asked to speak to the judge from the witness stand. The opposing attorney objected so strongly that he was warned by the
NEW GEOLOGIC MAP OF NORTH AMERICA ILLUSTRATES DISCOVERIES AND ADVANCES IN GEOSCIENCE

Boulder, Colo. – The last definitive geologic map of North America was published before the theory of plate tectonics was widely accepted, back in the days when impact craters were known simply as “anomalies” and knowledge of ocean floor geology was in its infancy. This week the Geological Society of America (GSA) introduces the 2005 Geologic Map of North America. It is like no other in its representation of the grand architecture of the continent.

A work of beauty as well as science, the map is printed in 11 colors with approximately 700 shades and patterns. It distinguishes more than 900 rock units, 110 of which are off-shore. It depicts more than seven times as many on-land units as the 1965 map. Perhaps its most significant additions are detailed features of the seafloor, including spreading centers, seamount chains, and subduction zones.

“Our knowledge of the Earth and how it works has grown exponentially over the last 40 years,” said Jack Hess, Executive Director of GSA. “We are pleased and excited to offer this great mapping achievement to the scientific community.”

The map is the result of a cooperative effort by GSA, the U.S. Geological Survey (USGS), the Geological Survey of Canada (GSC), and the Woods Hole Oceanographic Institution (WHOI). John C. Reed Jr. (USGS) and John O. Wheeler (GSC) compiled the on-land geology, while Brian E. Tucholke (WHOI) mapped and compiled the seafloor. The Pikes Peak Lithographing Company, Colorado Springs, Colorado, printed the map.

More than twenty years in the making, the map illustrates approximately 15% of Earth’s surface. It spans an area from the North Pole to Venezuela and from Ireland to Siberia.

The map’s developers describe it as a source for new interpretations of North American geology and insights into the evolution of the continent. “It will also aid in the discovery of mineral and energy resources, increase our ability to understand and mitigate geological hazards, and support improvements in land and resource management,” said John Wheeler of the Geological Survey of Canada.

Unlike its predecessor, the map is not a static end-product. Because it was produced with digital technology, a digital database is planned by David Soller of the U.S. Geological Survey. According to Soller, “Geoscientists for years to come will be able to access and analyze the data behind the map. This will stimulate additional research, expanding our body of knowledge at an increasingly rapid rate.”

The map is available for purchase through the Geological Society of America. For additional information, visit www.geosociety.org/bookstore or contact GSA Sales and Service, gsaservice@geosociety.org, +1-888-443-4472.

American Institute of Professional Geologists
Kentucky Section

42nd ANNUAL MEETING
LEXINGTON, KENTUCKY
OCTOBER 9-14, 2005

CALL FOR PAPERS

You are cordially invited to attend the 42nd Annual Meeting of the American Institute of Professional Geologists hosted by the Kentucky Section of AIPG in Lexington, Kentucky, October 9-14, 2005. The theme of this year’s meeting is “Geologic Information: Racing into the Digital Age.”

The Commonwealth of Kentucky has long been a leader in the publication of geologic maps and posting of online geologic data. In 1978, under a cooperative geologic mapping project involving the U.S. Geological Survey and the Kentucky Geological Survey, Kentucky became the first state in the Union to be completely mapped for all 707 quadrangles (1:24,000 scale, 7.5 minute). In 2002, Kentucky became the first state to have all of its open-file oil and gas geophysical logs and driller’s logs available online. In 2004, the Kentucky Geological Survey converted into digital format 707 printed geologic quadrangle maps for the state. From the far-reaching results and benefits of Kentucky’s geologic maps, the visitors to the 2005 Annual Meeting of AIPG will find the content of the technical sessions targeted to innovative techniques in mapping and computer applications, thus the theme “Geologic Information: Racing into the Digital Age.”

This year’s meeting not only incorporates our goal of highlighting geological mapping and computer applications, but also offers a forum to provide opportunities for reporting on regional geologic studies pertaining to a variety of topics. Such topics include energy and mineral resources, stratigraphy, sedimentology, paleontology, structural geology, basin analysis, and geophysics of the Appalachian Basin, Illinois Basin, Mississippi Embayment, Cincinnati Arch, and Nashville Dome. Kentucky and adjacent states are world famous laboratories for karst and groundwater systems. The region’s prominence in the study and application of environmental and engineering geology are also notable. In addition, there will be a forum for AIPG’s core issues concerning ethics, public policy, licensure, and legislation. The Technical Program Committee encourages you to participate in this informative meeting by contributing a written abstract for an oral or poster presentation. All papers related to the meeting theme or to the proposed theme sessions outlined below will be considered.

Proposed Theme Sessions:

• Geology, Geographic Information Systems (GIS), and the Internet
• Geologic Mapping, Remote Sensing, and Computer Applications
• Environmental and Engineering Geology
• Energy and Mineral Resources
• Karst and Groundwater Systems
• Stratigraphy, Sedimentology, and Paleontology
• Structural Geology, Basin Analysis, and Geophysics
• Ethics, Public Policy, and the Geologic Profession
• Geologic Outreach, Education, and Communication
• Licensure and Legislation

For Abstract Format and Instructions please see the following page.
2005 Annual Meeting

ABSTRACT FORMAT AND INSTRUCTIONS:

The format described below must be used to submit your abstract. Your abstract will be published in the Annual Meeting proceedings exactly as it is submitted, so please read and follow these instructions. All information submitted should be typed in Arial or Times Roman font, 12 point size, on an 8 ½ x 11 inch paper, using portrait orientation. Page margins should be 1-inch at the top, bottom, left, and right.

1. TITLE: The first item you should list is the title of your abstract. Titles should be in bold upper and lower case text, aligned with the left margin, beginning on the first line below the top margin. Example title:

   The Integration of Kentucky's Geologic Quadrangle Maps with Coal Resource Data

2. AUTHORS: After the title, skip one line and type the senior author's name (last name first), followed by additional authors (see example below). CAPITALIZE the name of each author. In upper and lower case text following the author's name(s) include the author's affiliation, city, and state/province. If the speaker will not be the senior author, put an asterisk (*) after the speaker's name. Example authors:

   Lumm, Donald K., Kentucky Department of Revenue, Frankfort, KY, John T. Popp, Alliance Coal Company, LLC, Lexington, KY

3. ABSTRACT: Skip another line and begin the body of your abstract. Abstracts for both oral and poster presentations are limited to 250 words or less; abbreviations (except for units of measurement) are not permitted. Use the full width of the page (within page margins); indent the first line of each paragraph by ¼ inch. Lines must be single-spaced. Justify the type to the left and right margins. Illustrations, graphs, and references are permitted. PLEASE PROOFREAD your abstract; no corrections will be made after your abstract is submitted.

4. SUBMITTAL: You may either submit your abstract on a 3 ½-inch floppy or compact disc and mail to Donald K. Lumm, or you may e-mail the document on an attached Word file to Donald K. Lumm. In addition, please copy, complete and submit the abstract submittal form at the bottom of this page. The Deadline for Submitting an Abstract is April 30, 2005.

Mail Abstract and Abstract Form to:
Dr. Donald K. Lumm, Technical Program Chair
Kentucky Section, AIPG
P.O. Box 24690
Lexington, KY 40524-4690

OR
Email Abstract and Abstract Form to:
Dr. Donald K. Lumm, Technical Program Chair
DonnieLumm@aol.com

ABSTRACT FORM

Speaker's name: _____________________________________________________________
Affiliation (employer): ______________________________________________________
Office Phone: ___________________ Office FAX: ___________________ Email: ______________
Address: _______________________________ City, State, ZIP/Postal Code: ______________
For: Oral ______ Poster ______ Either ______ Are you a student? ______
Please indicate preferred session: 1) ___________________________ 2) ___________________
Mode of Presentation: 35 mm slides (projector______) overhead proj.______ PowerPoint (single screen) _____
AIPG History Book

How did AIPG really get started?
What roles did the well-established AAPG and AGI play in the formation of the first Professional (not scientific) geological society?
Who were the “Magnificent Seven” who founded AIPG in 1962-63?*
We were APGS in 1975-79 why did we change our name, and what does APGS stand for?

The answers to these and other questions make interesting reading to the curious as to the formation and progress of AIPG. After years of accumulating information, past-President Richard Proctor has finished the book, titled “A History of AIPG 1963-2003”; includes many photographs, a Who’s Who/Who Was Who in AIPG, and more than 70 selected speeches and papers by CPGs.

This 390 page book is available in hard cloth cover - $80.00, soft cover - $45.00, CD - $15.00 (include $4.00 for shipping and handling for CD and $10 for either book), or free online in pdf format.

(*The magnificent Seven who founded AIPG, by correspondence prior to the Organizational Meeting in September 1963, were Edward “Bud” Rue of Illinois, Frank Conselman of Texas, William Mallory of Colorado, Allen Tester of Iowa, Ad Honkala of Virginia, Robert Becker of Oklahoma, and Ben Parker of Colorado).
APPLICATIONS MAY BE CALLED AS A WITNESS IN ANY RESULTING PROCEEDING.

APPLICATIONS FOR CERTIFIED PROFESSIONAL GEOLOGIST

MT-Daniel B. Adams
2251 Goldrush Ave., Helena, MT 59601
TX-John Q. Belt, Jr.
Quintal Consulting, LLC, P.O. Box 550395, Dallas, TX 75355
MT-Andrew B. Carstensen
741 Taylor, Missoula, MT 59802
AK-John P. DeGeorge
1301 Hillcrest Dr., Anchorage, AK 99503
AK-James A. Hargy
1706 Link Court, Anchorage, AK 99504
OH-Brenda A. Hite
127 Kenilworth Dr., Akron, OH 44313
ID-Michael G. Maislow
6312 W. Pinegrove Dr, Coeur D'Alene, ID 83815
CO-Michael F. McGeinnis
4390 Morning Glory Rd., Colorado Springs, CO 80920
MI-Bruce R. Noble
2250 W. Kirby Rd., Battle Creek, MI 49017
OH-Jeffrey S. Rouson
42 Dexter St., St. Catharines, ON L2S 2L7 CANADA
MN-Damon M. Powers
3838 Buchanan St. N.E., Columbia Heights, MN 55421
NV-John A. Rice
P.O. Box 20074, Reno, NV 89515
CA-Catherine M. Shuman
P.O. Box 671441, Chugiak, AK 99567
MI-Ky-Mark F. Wood
1045 Alta Vista Road, Louisville, KY 40205

NEW CERTIFIED PROFESSIONAL GEOLOGISTS

OH-Rick L. Darr
CPG-10838
1624 Home Rd., Delaware, OH 43015
NE-David R. Mattimore
CPG-10840
210 Field Street, Athens, GA 30602-2501
MI-Charles E. Malanik
CPG-10851
73 Willow Ave., Rockaway, NJ 07866-2825
OH-David J. Sugar
CPG-10837
3386 Northbrook Dr., Atlanta, GA 30340
MI-Stephen K. Young
CPG-10853
13150 112th Ave., Grand Haven, MI 49417
Hi-Glen R. Bauer
CPG-10855
PO Box 621, 1151 Punchbowl St, Kailanimoku Bldg.,
Rm. 227, Honolulu, HI 96820
Hi-Kevin L. Gooding
CPG-10856
PO Box 631, Waimanalo, HI 96795
AK-William R. Lawrence
CPG-10857
Hoefler Consulting Group, 3401 Minnesota Dr, #300,
Anchorage, AK 99503
HK-Peter Kraekeri
CPG-1089
Flat 1, 16F, Universal Indsut, Centre, 19-25 Shan Mei Street, Fo Tan, Shatin, N.T. HONG KONG
NV-Timothy G. Thompson
CPG-10859
911 Pemberton Dr., Spring Creek, NV 89815-7408
CO-Charles H. Thorman
CPG-10860
12464 W. 2nd Dr., Lakewood, CO 80228
MI-Randal J. Gair
CPG-10861
147 N. Maple St., Fowlerville, MI 48836
MI-Douglas E. McVey
CPG-10862
Clayton Group Svs., Inc., 39830 Grand River Ave.,
Ste. B-2, Novi, MI 48375-2134
MO-Enc T. Mosley
CPG-10863
LBG, Inc., 2103 Burlington St., North Kansas City,
MO 64116
OH-Gregory Nowak
CPG-10864
6966 Gates Rd., Gates Mills, OH 44040-9666
OH-Frank J. Tokar, Jr.
CPG-10865
506 Eagle Point Rd., Rosasford, OH 43460
AK-Brian P. Flanigan
CPG-10866
P.O. Box 84650, Fairbanks, AK 90708
MI-Daniel R. Cassidy
CPG-10867
Soil & Material Engrs., Inc., 43980 Plymouth Oaks Blvd., Plymouth, MI 48170
RI-Douglas E. Ganey
CPG-10868
20 Bianco Ct., Providence, RI 02909-1705
KY-Bruce DeWayne Gaylord
CPG-10869
203 South Pearl St., Irvington, KY 40146
MI-Steven J. Hoin
CPG-10870
630 East Crest Ln., South Lyon, MI 48178
MI-Jason P. Iseler
CPG-10871
5024 West 6 Road, Buckley, MI 49620
MI-Heaton C. Stein
CPG-10872
3023 N. Altadena Ave., Royal Oak, MI 48073

NEW MEMBERS

IN-Terry R. West
MEM-0735
5 Tall Oak Lane, W, Lafayette, IN 47906
CO-Richard L. Nielsen
MEM-0736
13741 Braun Dr., Golden, CO 80401
TX-James Ford
MEM-0737
Hra Gray & Pape, LLC, 4801 Woodway Dr. Suite 250
E. Huston, TX 77056
HI-Troy N. Rosenbush
MEM-0739
5204 West 6 Road, Buckely, MI 49620
MI-Heaton C. Stein
MEM-0737
3023 N. Altadena Ave., Royal Oak, MI 48073

NEW STUDENT ADJUNCTS

GA-Allie J. Hatton
MEM-0754
12464 W. 2nd Dr., Lakewood, CO 80228
GA-Sarah A. Coker
MEM-0755
10200 Park Meadows Dr., Unit 2727, Littleton, CO 80124-5471
IN-Megan D. Martz
MEM-0756
At & Witzgall Engineering, Inc., 4105 W. 99th Street,
Carmel, IN 46032

NEW STUDENT ADJUNCTS

GA-Lina Wayo
SA-0666
210 Field Street, Athens, GA 30602-2501
GA-Heather Bailey
SA-0667
143 Howard Road, Senoia, GA 30276
GA-Jessica Hatton
SA-0658
2075 Old Register Rd. Lot 38, Statesboro, GA 30460
NM-Dominic D. Hoy
SA-0659
HC 70 Box 3204, Glorieta, NM 87535
GA-Donald W. Hardison, Jr.
SA-0661
288 Maple Ridge Dr., Jackson, GA 30233
CO-Scott R. Niswanger
SA-0662
1609 Taft Street, Lakewood, CO 80215
CO-Sarah A. Coker
SA-0765
10200 Park Meadows Dr., Unit 2727, Littleton, CO 80124-5471
GA-Julie L. McWilliams
MEM-0754
2200 Azalea Circle, Decatur, GA 30033
GA-Roxie J. Turner
MEM-0755
3296 Northbrook Dr., Atlanta, GA 30340

AIPG MEMBERSHIP TOTALS

As of 02/10/04
As of 2/22/05
CPG - Active
3,833
3,760
CPG - Retired
492
477
Member
517
585
Registered Membr.
21
16
Associate Membr.
16
19
Student Adjunct
248
418
Honorary
22
22
Corporate Member
3
5
TOTALS
5,152
5,302

www.aipg.org
AIPG MEMBERSHIP CLASSIFICATIONS AND REQUIREMENTS

CERTIFIED PROFESSIONAL GEOLOGIST

EDUCATION: 36 semester or 54 quarter hours in geological sciences* with a baccalaureate or higher degree; certified copy of official transcripts must be sent by each college or university

EXPERIENCE: 8 years beyond bachelor's degree, or 7 years beyond master's degree, or 5 years beyond doctorate

SPONSORS: 3 required from professional geologists, 2 of whom must be CPG's (see Section 2.3.1 of the Bylaws for exceptions)

SCREENING: Section and National

APPLICATION FEE: $50 (to upgrade from Registered Member or Member to CPG, the fee is $35)

ANNUAL DUES: $120 plus Section dues; both pro-rated for remainder of year when accepted

MEMBER

EDUCATION: 30 semester or 45 quarter hours in geological sciences* with a baccalaureate or higher degree

SPONSORS: 1 required from a CPG or Member

SIGNUP DUES: $40 (current years dues)

ANNUAL DUES: $55 plus Section dues

APPLICATION: See form below.

STUDENT

EDUCATION: Currently enrolled in a geological science degree program*

SPONSOR: 1 letter from geological science faculty member

APPLICATION FEE: $5

ANNUAL DUES: $15

ASSOCIATE

No education, experience, or sponsors required. This category is for anyone that has an interest in geology.

APPLICATION FEE: None

ANNUAL DUES: $60 plus Section dues; both pro-rated for remainder of year when accepted

*As defined by the American Geological Institute, a geological science is any of the subdisciplinary specialties that are part of the science of geology, e.g., geophysics, geochemistry, paleontology, petrology, etc.

Note to those who received their degrees from non-U.S./Canadian universities: If you received a degree from a university or college outside the U.S. or Canada, and the school is unable to provide an acceptable transcript, you must submit a copy of your diploma and a list of courses taken. The Screening Committee may ask you to provide additional information or an equivalency evaluation, at your expense.

AIPG MEMBER APPLICATION

---

American Institute of Professional Geologists Membership Application

Current year $40; Thereafter $55 plus Section Dues.  Payment (Check one): □$40 Enclosed □Bill Me

Last Name:   First Name:   MI:   Suffix:

Employer Name:

Preferred Mailing Address: □ Home  □ Business

Street:

City: State: Zip: Country:

Work Ph:   Home Ph:   Fax:

Email:

Geological Degree: □D.A.  □B.S.  □M.A.  □M.S.  □Ph.D.  □University

ATTESTATION: I attest that I meet the requirements for AIPG Member (30 semester hours/45 quarter hours for Member) and agree to abide by AIPG Bylaws and Code of Ethics.

Applicant Signature: Date:

AIPG Mbr Sponsor  AIPG #:  Date:

Signature (Required): □CPG  □MEM  □RM

HEADQUARTERS USE ONLY

Amt: Date Rovd: Mbr #

---

www.aipg.org

MARCH/APRIL 2005 • TPG 35
PROFESSIONAL SERVICES DIRECTORY

This service is open to AIPG Members as well as non-members. The Professional Services Directory is a one year listing offering experience and expertise in all phases of geology. Prepayment required. Advertising rates are based on a 3 3/8” x 1 3/4” space.

12-MONTH LISTING FOR ONLY:
AIPG Member $200.00
Non-Member $300.00
Space can be increased vertically by doubling or tripling the size and also the rate.

Higgins and Associates, LLC
Environmental Consultants
Assessment, Health & Safety Services, Remediation, and Reimbursement Services

CHARLES H. JENSEN, JR., P.G.
HYDROGEOLOGIST
8200 S. Akron St., Suite 117
Centennial, CO 80112
(303) 708-9846
Fax (303) 708-9848
Toll Free 1-877-881-4525

HB Management Group
Engineering, Risk Analysis, Turn-Arounds (Svetovalec/Innenricht).

Kelvin J. Buchanan, P.E., M.B.A.
President
USA
575 Forest St., #100
P.O. Box 2391
Reno, NV 89505-2391
Tel: (775) 786-4515
Fax: (775) 786-4124
E-mail: summitcrk@aol.com

EUROPE
Alpka 8
4248 Lece
Slovenia
Tel: 386-04-537-88-54
Fax: 386-04-537-88-40
E-mail: mtjudah@aol.com

Dr. Robert Font, CPG, PG, EurGeol
President
Geoscience Data Management
Our geoscientists specialize in database entry of G&G and engineering records.
Petroleum geoscience and geohazards courses also available.
214-213-9331 Cell
www.geosciencedm.com
8200 S. Akron St., Suite 117
www.aipg.org

David M. Abbott, Jr.
Consulting Geologist
AIPG CPG, FAusIMM, Ch Geol. FGS, EuroGeol, PG-TX, UT, & WY
evaluating natural resources, disclosures about them, reserve estimates, and geological ethics & practices
2266 Forest Street
Tel: (303) 394-0321
Denver, CO 80207-3831, USA
Fax: (303) 394-0543
DMAgeol@aol.com

Leaky Lake? We fix them!
“The Pressure Grouting Specialist”

HB Management Group
Engineering, Risk Analysis, Turn-Arounds

Kelvin J. Buchanan, P.E., M.B.A.
President
USA
575 Forest St., #100
P.O. Box 2391
Reno, NV 89505-2391
Tel: (775) 786-4515
Fax: (775) 786-4124
E-mail: summitcrk@aol.com

EUROPE
Alpka 8
4248 Lece
Slovenia
Tel: 386-04-537-88-54
Fax: 386-04-537-88-40
E-mail: mtjudah@aol.com

Dr. Robert Font, CPG, PG, EurGeol
President
Geoscience Data Management
Our geoscientists specialize in database entry of G&G and engineering records.
Petroleum geoscience and geohazards courses also available.
214-213-9331 Cell
www.geosciencedm.com
8200 S. Akron St., Suite 117
www.aipg.org
PROFESSIONAL SERVICES DIRECTORY

Quality Surface & Borehole Geophysics
for Environmental & Engineering Projects
Take a closer look. You’ll like what you see!

HAGER-RICHTER GEOSCIENCE, INC.
www.hager-richter.com
603-893-9944
National Reputation / Nationwide Service

- Seismic Refraction/Reflection
- Ground Penetrating Radar
- Electromagnetic Induction
- Magnetitecs
- Resistivity
- Borehole Geophysics
- Crosshole Seismic
- Borehole Video
- Blast/Vibe Monitoring
- Gravity, VLF, & more

A GREAT DEAL!
BUSINESS CARD SIZE AD FOR ONE YEAR IS ONLY $200
(Non-Member Price - $300)
ADS ARE ALSO PLACED ON THE AIPG NATIONAL WEBSITE INCLUDING LINKS TO YOUR COMPANY WEBSITE AND E-MAIL.

E-mail or mail in your business card ad in today!

www.aipg.org
SECTION NEWS

Georgia Section
One of the main problems we hear from the membership is that they do not have the time to attend dinner presentations or weekend field trips because of work or family commitments. With a large percentage of the membership in the Atlanta area we have added short one-hour field trips to local interest. In 2004 we had two meetings during the work week. In July we examined conventional cores collected for a new tunnel planned for the Atlanta area to transport sewage. In December we visited a dual-phase remediation system that was cleaning up a gasoline and dry cleaner release. The free product gasoline plume was approximately 250 feet long and the dissolved plume was approximately 400 feet long. The contamination traveled beneath two subdivisions so dealing with getting offsite permission and keeping the homeowners informed and happy was a challenge.

In March 2005 we will visit another remediation system that has five horizontal wells for removal of free product and dissolves and six horizontal wells for remediating the vadose zone.

With these short meetings held in different locations of the metro area our goal is to offer something different to the membership where they will not need to travel a long distance and they will also learn something new.

Hawaii Section
Hawaii Section’s February - March 2005 Activities Announcement

Subject: The National Geodetic Survey is Introducing a Height Modernization Project in Hawaii.

The National Geodetic Survey is introducing a height modernization project in Hawaii (http://www.ngs.noaa.gov/heightmod/).

They had the initial forum on February 1, 2005 (http://www.ngs.noaa.gov/heightmod/HawaiiHMInviteFinal.pdf).

Kevin Gooding, CPG-10856, (DLNR and AIPG Hawaii Section) volunteered to be on the steering committee to represent DLNR and AIPG. The last time heights have been “renewed” in Hawaii was the early 1970’s. Since then these benchmarks have been aging: getting lost, damaged, altered, or destroyed.

In 2003 the USGS, National Geodetic Survey and my office worked on elevation benchmarks on Maui. DLNR used survey grade GPS that is good to 3 cm in the vertical. We found lots of errors in elevation at Maui benchmarks. Some over a meter. Not to say that they did a bad job in the 1970’s but that the benchmarks have been altered in some way or the tidal epoch is old.

Follow-up: The first step in the project will be to get federal funding from Congress with help from the “elevation data user community”. Then the steering committee with input from everyone that is interested will help plan what kind of height network is needed in Hawaii. Probably the first step will be to just renew some of the existing benchmarks (DLNR did a little of this on Maui and the Hawaii DOT is currently renewing benchmarks from Ewa to Kaimuki). Later a VRS system could be established. Kevin’s interest in elevations has been to determine accurate water levels in wells but there are probably many other applications for geologists. Kevin Gooding can be contacted at (808) 587-0265 if anyone has input on this project or would like additional information.

Subject: Rock Fall Training with USGS in Oahu, Hawaii.

Ed Harp from the Denver Regional Office of the United States Geological Services (USGS) will be conducting two, one week training sessions in Hawaii.

When: The training will be conducted during the weeks of March 14 and March 21, 2005. Tentative Schedule for training will be one day of classroom work (Monday) followed by 4 days in the field.

Where: Training will be held at Kalanikou Building (1151 Punchbowl Street), DAGS conference rooms A & B on the 3rd floor from 8 am to 4 pm on both March 14 and March 21, 2005.

Follow-up: USGS needs to get a head count of those that are interested in participating. If you know of other groups (CECH, APA, AIA, etc.) who may be interested in participating, please feel free to forward this e-mail as an open invitation. Please contact Dean Uchida, Executive Director Land Use Research Foundation of Hawaii (808.521.4717) or Morris Atta, Special Projects Coordinator, Land Division (Morris.M.Atta@hawaii.gov) 808.587.0410 to sign up or if you have any questions.

Mark W. Rogers, CPG
AIPG Hawaii Section President

www.aipg.org

MARCH/APRIL 2005 • TPG 39
**SECTION NEWS**

**Kentucky Section**

**ELECTION RESULTS – 2005**

Kentucky Section Officers

The results are in, and 25 voters elected the following officers unanimously:
President Elect: Tim Crumbie
Vice President: Faith Fiene
Treasurer: Gil Cumbee

Editor: Jennifer Miller, who later withdrew and was replaced by Richard Smath.

AIPG NATIONAL MEETING
LEXINGTON, KY – October 9-14, 2005

Planning for the 2005 Annual meeting is ongoing. The field trip selection has been made. The plan is to have major outings at the beginning and end of the meeting with the trip to Mammoth Cave on Monday the 10th and a trip to the Red River Gorge on Friday the 14th at the end of the conference.

The call for papers is on the web and our web site. The committee is rapidly moving toward finalization of our entire agenda for the February time frame.

In the mean time our Sponsorship committee is drumming up sponsors for our meeting. Sponsorships are available at various levels and more can be learned from visiting www.professionalgeologist.org/aipg2005.html

We are in communication with National on the requirements that they have for the sessions necessary to run our organization year to year.

Please take time to sponsor the success of our meeting. Our success will translate into a stronger scholarship position for the next generation of geologists. Also, pending approval by our executive committee, we plan to donate a percentage of our profits to provide for earthquake recovery infrastructure in South East Asia.

**Michigan Section**

Grants further science learning
By Christopher Nagy

DAILY PRESS & ARGUS

Catherine Grieve knows the science of stretching a dollar.

With a $2,000 science budget divided among 10 teachers and 800 students, Grieve, the science coordinator at Brighton Area Schools’ Maltby Middle School, does not have many options other than making every penny count; however, one option that is available is something that Grieve is using for all it is worth.

“We don’t really have a lot to work with - not when you’re trying to run a hands-on science program,” Grieve said. “People think the schools do well because the community does well, but we’re in the lowest third in funding from the state. People don’t know just how tight it is.”

Grieve is closing in on nearly doubling her science budget at the school this year thanks to dedication and diligence on grant applications.

She has received a $1,100 grant from the Michigan Section of the American Institute of Professional Geologists that was submitted with the help of science teacher Bruce Hedberg, and just last week, Grieve added another $331 thanks to a grant from the Detroit Edison Energy Foundation. Both grants will be used to purchase science-related materials.

The grant from the American Institute of Professional Geologists will be used specifically for earth science.

Already, kits on chemical weathering of rocks for the seventh grade, which will be used this year, and kits on reading river sediments for the eighth grade, to be used next year, have been purchased.

Remaining funds are being dedicated to buying an overhead flow table, which simulates real-world water, air and magma events such as water cycles, air masses, jet streams, groundwater pollution and plate tectonics.

“You can represent all types of different developments,” Grieve said. “It fits in differently and has different objectives for the different grade levels. The American Institute of Professional Geologists said this was the first year the whole grant went to one school because they felt it would impact the most students. We were darn lucky to get this one.”

**Oklahoma Section**

Rick Wymer proposed on January 15, 2005 that the Section donate $500 to the Oklahoma Science Bowl - Math and Science Competition to be held on March 5th at the Sarkey Energy Center. Joel Nelson seconded the motion on January 17, 2005. Members voted by email and the motion passed on January 20, 2005. The Science Bowl would like to have AIPG members as volunteers to act as judges for this event.

Jeff Laughlin indicated to the committee that the TPG January issue focuses on student chapters. The Oklahoma Section recently signed up 12 new student members at the Univ. of Tulsa.

(Follow-up: the AIPG Executive committee proposed, voted, and approved to pay one-half ($10) of the 2005 dues for the current student members at TU on January 17, 2005.)

Michael Root indicated that the 2004-05 dues for the OU students have been paid for by the Oklahoma AIPG Section.

**AIPG Sections are encouraged to submit Section News.**
Scott Mernitz, AS-0003

This article might be subtitled “what the environmental geologist can do to promote sustainability in mining projects.”

If all of us can do our part to keep this issue in the forefront on the projects we help to develop, the mining industry will in turn do a better job in gaining favor with the general public.

And I must say initially that I am not a geologist, but an environmental scientist with some earth sciences and geomorphology training, and with a lot of exposure to environmental geology through current and past consulting relationships. Perhaps my words, as a non-geologist and Associate Member of AIPG, will have some benefit to your perspectives.

Sustainability

What an impact this word and concept have had on mining environmental work in the past 5 years! Mining commentators and industry people read, write, and talk about it constantly.

For the rest of the world, some folks have suggested the topic has been around for more than 15 years! Now, everyone has their definitions and the ones I like to apply to mining projects are similar to and adapted from the basics:

• **First**, a project must have [financial sustainability](#) to succeed for a minimum period, say 5 years or more, and in turn to have a positive impact on its environmental, social, and political surroundings;

• **Second**, a project must have [environmental sustainability](#), addressing protection of the natural and physical environment, and its ecosystems, with a strong view to long-term productivity;

• **Third**, and in combination with its financial position above, a project should promote [economic sustainability](#), that is primary (basic extraction and processing), secondary (suppliers of equipment and hard goods), and tertiary (suppliers of soft goods and related services) activity and economic growth, and reduction of poverty;

• **Fourth**, [social sustainability](#) must be a key component of minerals project development, including numerous opportunities for fulfilling human potential; and we should perhaps add the last key factor:

• **Fifth**, the existence, sustenance, and development of appropriate [governance](#) structures, both official and unofficial, formal and informal, to make the project work and contribute favorably, in all aspects of sustainability, to its setting (Figure 1).

As you are exploring or developing project plans, think seriously about these historic practices, local miners and social and economic sustainability: what can we do as a mining company to truly train and employ most of these artisanal miners in our project? Or should we leave an area for local artisans to continue mining?

If we do allow project development in a local miners’ area, what will such working conditions do to our ore reserves, mining and milling plan, and transport? Will there be continuing environmental degradation that will affect perceptions and operations of our commercial project? Will there be social unrest? Will such social and environmental unrest upset and eventually make our project uneconomic?

And what will mining this orebody in this location do to local governance? Are there small villages, tribal chiefs, organized community groups, agricultural co-ops, trading markets, and/or sites of local religious or cultural significance that would be adversely affected, or be distinctly changed, by project operations?
**True “Baseline” Conditions**

As a geologist, your studies will help to establish environmental baseline conditions that exist prior to mining development. Mineralized areas have natural geologic and hydrologic effects on soils, surface and ground water, and sometimes air quality in a region prior to human disturbance (Figure 3).

Artisanal miners may have affected the baseline conditions as discussed above, and their effects must be documented before large-scale mine permitting is initiated so that your company is not saddled with the blame for past degradation.

The environmental geologist and geochemist have key roles here. In order to address environmental sustainability of the project, the natural and human-affected “baseline” for water, soil and rock, vegetation, and air quality leading up to modern, large-scale mine development must be established and agreed upon with the regulatory agencies. What levels of degradation have occurred? How well is degradation documented and with what data quality? How do these levels compare to regulatory standards? In practice, project managers may need help from the geologist in agency negotiations, in order to meet regulatory standards in discharges and emissions.

As to larger issues, the geologist should help management with thinking ahead as the project planning proceeds. Can the environment in this geological and geochemical setting stand more degradation from commercial mining and still sustain a reasonable quality of life for humans, animals, plants, and the general ecosystem (Figure 4)?

Will your company’s proposed mitigation measures be effective and achieve environmental sustainability? Will your mining company likely be committed to funding and carrying out this mitigation, and reporting accurate progress to the regulatory authorities? Regarding the issue of project funding, will reclamation and closure at this site require special and extended maintenance, bonds, and long-term process water treatment? Will these reclamation and closure activities provide extended employment for locals? These issues must all drive the environmental geologic risk analysis for mining development.

**Socio-Cultural Conditions**

Issues of land and mineral title, displacement of local livelihoods, and security for the new operation will often arise as the new larger-scale commercial mine is developed. The mining company is often not native to the country under development, causing additional local resistance. This resistance can arise from local community groups including artisanal miners; and regional, national, and international NGOs (Non-Governmental Organizations; such as environmental protection and human rights groups).

The environmental geologist joins forces with social and community specialists to assess risks. Specific community relations plans, social and economic impact assessments, training programs, local hiring practices, and special management efforts are required to effectively deal with a project area, especially those areas with a history of artisanal mining.

Again, attention to social sustainability and governance—through analysis of the socio-cultural setting—is timely. The topics could include tribal organization and folkways, local customs, lifestyles, family structure, and many other issues that will add to the risk analysis and the success of the project (Figure 5).

**Mineral Economics**

The exploration geologist’s role in project profitability is to identify additional reserves, beyond current mining, to extend project life. Conversion of resources to reserves is accomplished by additional drilling to better define the ore body and its characteristics.

As you are stepping out to drill and explore nearby or remote areas, keep in mind some of the issues introduced above. What watercourses are nearby, and how pristine do they appear? Are these waters apparently affected by natural mineralization or by past artisanal activity? Is one prospective portion of the orebody in an environmentally sensitive area that is too rich to ignore or work around (Figure 6)?

The geologist’s initial contacts and continuing work with national and state government agencies, local officials and local citizens sets the stage for how the mining company may truly promote sustainability as the project develops and is successful. Missteps early on have led to delays and later unprofitable projects in Peru, Argentina, Turkey, Greece,
New From the USGS...

**SIR 2005-5017. NORTH DAKOTA, MINNESOTA.**

**SIR 2004-5219. MICHIGAN.**
Environmental factors and chemical and microbiological water-quality constituents related to the presence of enteric viruses in ground water from small public water supplies in southeastern Michigan. By Donna S. Francy, Rebecca N. Bushon, Julie Stopar, Emma J. Luzano, and G. Shay Fout, 54 pages.


**SIR 2004-5220. ARIZONA and UTAH.**

**SIR 2004-5221. OKLAHOMA.**


**SIR 2004-5244. ARKANSAS.**


**WRI 03-4217. TENNESSEE.**

**USGS Toll-Free Information: 1-888-ASK-USGS (1-888-275-8747) or http://www.usgs.gov**

---

** Mine Rock Piles and Pyritically Altered Areas: Their Slope Stability and Effect on Water Quality**

**Topical Session Number 42**
**GSA Fall 2005 Meeting**
**October 16-19**
**Salt Lake City, Utah**

**Session Description:** Presenters describe multidisciplinary characterization studies of mine rock piles, tailings dams, and naturally exposed alteration areas. Workers analyze the effects on (1) nearby water quality and (2) the stability of mine rock piles and hydrothermal alteration areas.

**Electronic submission:** April 1 through July 12, 2005 – http://www.geosociety.org/ 

**Sponsors:** GSA Engineering Geology Division and the Geochemical Society

Advocates: Patrick Walsh, pwalsh@gis.nmt.edu, Kathleen S. Smith, ksmith@usgs.gov, and Virginia T. McLemore, ginger@gis.nmt.edu

**Call for Papers**

A topical session, entitled “Mine rock piles and alteration areas – effects on water quality and slope stability”, will be held at the Geological Society of America (GSA) fall 2005 meeting in Salt Lake City, Utah. Presenters will discuss multidisciplinary characterization studies of mine rock piles, tailings dams, and naturally exposed hydrothermal alteration areas. The presentations will focus on analyzing the effects of mining activities and naturally occurring alteration areas on 1) nearby water quality and 2) the stability of mine rock piles and alteration areas. The session is sponsored by GSA Engineering Geology Division and the Geochemical Society. Abstracts can be submitted in electronic from between April 1, 2005 and July 12, 2005 at http://www.geosociety.org. A copy may also be sent directly to session advocates Patrick Walsh (pwalsh@gis.nmt.edu), Kathleen Smith (ksmith@usgs.gov), or Virginia McLemore (ginger@gis.nmt.edu).

www.aipg.org
AIPG STORE (also available online at www.aipg.org)

NEW ITEMS!...NEW ITEMS!...NEW ITEMS!

**Button-Up Shirts**

**Pyrite (fool's gold)**

**Sweatshirts**

**A Correlated History of the Universe**

This folded map fits in a shirt pocket and also includes the new “A Correlated History of MATTER”. The detailed natural history timeline is extended back to the big bang and additional reference material for geology, astronomy, mineralogy, meteoritics, chemistry and physics has been added.

**A Correlated History of Earth**

“A Correlated History of Earth” is a full-color educational wall chart documenting 4.5 billion years of earth’s natural history. Each column is a timeline from ancient times to recent.

**T-Shirt**

**Tourmaline**
<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Price</th>
<th>Qty</th>
<th>Line Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Quantity</td>
<td>Description</td>
<td>Price</td>
</tr>
<tr>
<td>Goff Shirt, AIG &amp; USB</td>
<td>$35.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black on upper left chest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG &amp; USB</td>
<td>$15.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen Glove, AIG</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ROCKWORKS BOREHOLE MANAGER FEATURES A COLLECTION OF OVER 60 APPLICATIONS
Easily create cross sections, boring logs, fence diagrams, solid models (plume), stratigraphic and lithologic models, surfaces, contour maps (e.g. elevations and thickness), geotechnical models (e.g. cohesion, compaction, shrinkage, etc.), volumetrics, projected sections, Piper and Sulf diagrams, stereonets, rose diagrams, ternary diagrams and much more!

<table>
<thead>
<tr>
<th>Item</th>
<th>Desc.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE00506</td>
<td>Single User, Academic</td>
<td>$399</td>
</tr>
<tr>
<td>BE00502</td>
<td>Single User, Commercial</td>
<td>$999</td>
</tr>
</tbody>
</table>

Other licensing available

Environmental • Mining • Petroleum

LogPlot

An easy-to-use boring log plotting program with almost unlimited flexibility in log layout. Plot a single page log for shallow borings, or a multiple page/continuous well log for deep wells.

Creating a log plot is Simple
1. Select Log Design
2. Enter/Import Your Data
3. Compile & Display Your Graphic Log

<table>
<thead>
<tr>
<th>Item</th>
<th>Desc.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE00472</td>
<td>Single User, Academic</td>
<td>$199</td>
</tr>
<tr>
<td>BE00488</td>
<td>Single User, Commercial</td>
<td>$599</td>
</tr>
</tbody>
</table>

Other licensing available

LogPlot has been widely used in the environmental, petroleum, geotechnical and mining industries since 1983

Aq-QA® Spreadsheet for Water Analyses

- Convert units
- Paste data directly from Excel
- Calculate hardness, alkalinity, much more
- Check internal consistency
- Professional quality graphics
- Visit www.aqqa.com

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Desc.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE10356</td>
<td>Academic Version 1.1</td>
<td>$699</td>
</tr>
<tr>
<td>BE10355</td>
<td>Commercial Version 1.1</td>
<td>$799</td>
</tr>
</tbody>
</table>

AqTesolv

The original all-in-one package for the design and analysis of aquifer tests

- Pumping tests
- Step-drawdown tests
- Variable-rate tests
- Recovery tests
- Multi-well slug test analysis
- Oscillatory slug test solutions
- Frictional well loss for slug tests
- Simultaneous visual curve matching for displacement and derivative data
- And much more!

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Desc.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE00289</td>
<td>Standard Single License</td>
<td>$500</td>
</tr>
<tr>
<td>BE00285</td>
<td>Professional Single License</td>
<td>$750</td>
</tr>
<tr>
<td>BE00410</td>
<td>Add Buffer</td>
<td>$550</td>
</tr>
</tbody>
</table>

LogPlot has been widely used in the environmental, petroleum, geotechnical and mining industries since 1983

Over 200 Environmental & GIS Software Solutions at RockWare.com

2221 East St. Golden, CO, USA 80401 303-278-3334 Fax:303-278-4099 Sales@rockware.com