WANTED - TPG ARTICLES

Instructions to Authors

The TPG accepts articles of modest length for publication. Submittals should be no more than approximately 1600 words, or six typed pages, double spaced. Longer articles may be divided into parts (e.g. part 1 and part II), but this is not encouraged. Articles may be technical or professional in nature. General topics are listed below. Articles containing news of importance to professional geologists will also be considered. Except for news articles, or articles containing dated materials, submittals should be sent to AIPG headquarters twelve weeks in advance of expected publication. Some technical topic issues are planned up to one year before printing; therefore early submittals will be preferred.

Manuscripts should have the following section:

Title
Author(s) with CPG number and address
Text
Tables if included
Figures with captions if included
Appendix(es) if included
Acknowledgements
References Cited

One original and two copies of each manuscript should be submitted. Whenever possible, text should also be submitted on diskette. Headquarters uses WordPerfect 7 for Windows '95, which is preferred, but Word, ASCII, RTF, or translatable files are acceptable. The program or format of the text should be clearly marked on the diskette. Articles can also be transmitted by e-mail.

Graphics should be clear, camera-ready, line drawings whenever possible. Photographs (color or black and white) are also encouraged. Whenever possible, drawings may be submitted on diskette in .pcx, .bmp, .tiff, .gif, or other standard formats.

TPG wants color slides and photographs. Slides and photographs alone may be submitted for the cover. They should have a geologic theme and an informational caption.

General Topics:

Technical
- Mining (January)
- Petroleum Geology (March)
- Hydrogeology (July)
- Environmental Geology (September)
- Geophysical/Engineering (November)

Professional (any issue)
- Government and the Geologist
- Ethics and Standards of Practice
- Public Perception of Geology and Geologists
- Definition, Certification, and Licensing
- Practicing Geology Internationally

Other suggestions: Forensic Geology, History of Practice in a given field, Book Reviews, and Geology and the Military, Unusual Applications of Geology.

Authors are encouraged to communicate with Headquarters via mail, fax, or Internet. Send your article and/or photographs, or communicate questions to:

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FRONT COVER - Kaaterskill Falls which flows through layers of Devonian shale, siltstone and sandstone in the Catskill Mountains of New York. Photograph by Eric A. Weinstock, CPG-7391.

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TELL ME WHAT TO TELL YOU WHAT TO SAY

It is often that I am asked my opinion on some issue in the news, and although I may have some opinion on the matter, the issue may not necessarily be within my area of expertise, or I rely much on intuition regarding a certain issue and have not clearly developed the basis for why I feel a certain way toward a particular subject matter. One of the objectives of AIPG is to provide representation of and advocacy for the geological profession before government and the general public. AIPG accomplishes this objective through its Members who provide testimony and position papers to federal and state legislators and agencies on matters affecting geologists and the geological profession. In addition to these efforts, AIPG also carries the flag and sets forth its message through another mechanism - the development, adoption and implementation of policy statements.

AIPG has developed fifteen policy statements to date dealing with professional matters that directly affect you and your ability to practice geology as a profession, and the relationship between geology and public policy. These statements have historically addressed issues pertaining to state registration and certification, specialty registration and certification, environmental audits and investigations, appraisals of mineral and related interests, the Clean Water Act and the Safe Drinking Water Act, groundwater policy, and the National Water Resources Policy. Last year, under the guidance of former President Jon Price, a position concerning the mission and name of the United States Geological Survey (USGS) was taken. In this case, AIPG was instrumental in making the geologic community aware of some of the important political and financial issues facing the USGS, and in providing guidance as well as political support for the USGS and several of its programs deemed primary to its mission and the needs of the geologic community and public (i.e., National Cooperative Geologic Mapping Program, Water Resources Division, etc.). This year, AIPG's policy on the Exercise of Professional Judgement was prepared which, along with numerous other professional organizations, financial lending institutions, and insurance companies, among others, adamantly opposed the use of prescriptive standards in the conduct of environmental assessments and geologic investigations. AIPG is currently in the process of developing committees to address certain policy areas concerning global climate change, wetlands and unfair competition-related issues, in addition to the continued review and updating of existing policy statements.

Much time and effort is exerted in developing policy statements, although I suspect that many do not quite know why such statements are important and how they can be used. The first step is to identify issues that are important enough to likely require development of a policy statement. Once an appropriate issue is identified, an ad hoc committee or task force is developed to address the significance of the issue, determine whether AIPG should develop a policy statement concerning the particular issue, and, if so, follow through and develop a draft position.

Once a draft position is formulated, it is first reviewed by the Executive Committee, and modified as appropriate, prior to being published as a draft statement in TPG for comment and further revision, as necessary. Much effort is spent assuring that all comments received are addressed. Only then does the statement go through final review (and typically more revisions) by the Executive Committee before being published in final form. A policy statement once developed does not necessarily address specific technical issues, but rather provides direction and guidance in dealing with complicated multi-faceted issues that affect our profession and the role geology plays in society.

Policy statements in general serve several purposes. They provide the foundation of AIPG's public policy effort, and reflect AIPG's position on matters that are relevant and germane to bills and legislation currently in existence, or being considered, that directly or indirectly affect our livelihood, profession and the public's welfare. From a political perspective, policy statements allow an opportunity for us to influence legislators. They also allow us to be consistent in our response to legislators and regulatory parties on a particular issue. This is not as easy as it may sound since political positions, even within the geological community, can vary significantly reflecting unconscious bias, hidden agendas, turf protection, differing perspectives and points of view, etc. When approached by members of the political or regulatory community about a particular issue, a policy statement can thus be used as an appropriate response which reflects AIPG's position on the matter, and in theory the consensus of the masses. From the legislator's perspective, these statements also allow them to enhance their appreciation of the role geology plays in public policy. In fact, a two-fold hand-out containing several of AIPG's policy statements, which are also available at AIPG headquarters, were distributed by our members to legislators and organization representatives during the recent Washington Fly-In as discussed later in this issue of TPG.

One can always ignore AIPG's position on a particular subject matter if, despite the efforts taken to fully address a certain issue to everyone's liking, AIPG's position remains contrary to one's opinion. However, I would rather take this opportunity to urge you to take the time and review AIPG's policy statements (all of which are presented in the directory), and provide your comments to headquarters regarding further modification or updating, as deemed necessary. Of course, the other alternative is to have no opinion at all and/or remain silent. I guess that I can only hope that as AIPG continues to give you what it has to give away, I trust that you will tell us what to tell you what to say!
Cost-Effective *In situ* Groundwater Remediation Using the Microbial Fence™ and Oxygen Release Compounds (ORC®)

John W. Jengo, CPG-8139

Introduction

In past Hydrogeology issues of *The Professional Geologist* (July 1993, 1994, 1995, 1996), I described methods such as geophysical logging, cone penetrometer testing with the ROST™ system, and Geoprobe® sampling to achieve cost savings and superior results when investigating contaminated sites. Yet, these savings can easily be lost when subsequently implementing conventional remediation alternatives like “pump and treat”. Thus, when dealing with petroleum hydrocarbon contamination from refinery, terminal, bulk plant, pipeline, or retail service station USTs, we have attempted to install cost-effective, low maintenance systems suited for remediating these biodegradable compounds. These systems also take into account the reality that both the client and the consultant’s attention will ultimately be diverted elsewhere, which usually results in equipment-intensive remedial systems having longer downtimes and lack of component replacement. Therefore, we endeavor to implement remedial solutions that would require little or no maintenance and incur O&M costs of only several hundred dollars per year.

The contamination problem at my client’s site was similar to thousands of sites nationwide, nearly a dozen leaking underground gasoline storage tanks (USTs) that contaminated groundwater with benzene, toluene, ethylbenzene, and xylenes (BTEX) as well as tertiary butyl alcohol (TBA) and methyl tertiary butyl ether (MTBE). Initially, all the USTs were removed along with grossly contaminated soils and sporadic occurrences of free product in the near vicinity. Once these sources were removed, no other soil excavations were performed because the focus at this site would be on groundwater, the media that had the greatest potential to migrate and impact receptors, particularly an offsite wetlands located several hundred feet downgradient. Based on the type of constituents and the hydrogeological conditions of the site, the Microbial Fence™, a form of *in situ* bioremediation, was selected as the best remedial alternative.

Figure 1. “Dewatered Microbial Fence™ trench, lined with filter fabric, being backfilled with clean gravel. Photograph by John W. Jengo, CPG-8139.
Figure 2. Microbial Fence™ trench, with PVC insertion wells and monitoring wells in place, being covered by filter fabric and modified gravel. Photograph by John W. Jengo, CGP-8193.

**Treatability Study Considerations**

Studies have shown that microorganisms capable of biodegrading petroleum hydrocarbons are essentially ubiquitous in the subsurface. The persistence of contaminants typically is not due to the absence of metabolically-competent microorganisms but results from environmental factors such as pH and oxygen/nutrient availability. For the remedial design for this site, a laboratory treatability study was performed to measure rates of oxygen consumption and hydrocarbon constituent biodegradation, and to determine whether the addition of inorganic nutrients would be necessary to maximize constituent biodegradation rates. Additional laboratory tests were conducted to define the extent to which the precipitation of dissolved minerals (particularly iron) could result from the introduction of oxygen into the site groundwater. The laboratory treatability study determined:

- microorganisms associated with the site groundwater were already acclimated to, and capable of, degrading the constituents of concern;
- no nutrient additions were required to enhance degradation; and,
- the estimated oxygen demand for degrading the constituents of concern could be met by chemical oxygen additions.

The study indicated that oxygen availability was the primary factor limiting the rate and extent of natural hydrocarbon degradation in the subsurface. Thus, the design of this Microbial Fence™ required selecting the most appropriate oxygen delivery system that could match the ideal rates of oxygen supply, oxygen consumption, constituent biodegradation, and groundwater flow. Other design considerations, such as the selection of a horizontal trench system and well spacing to deliver the oxygen, required interpretation of available geological, hydrogeological, and chemical site characteristics data, including hydraulic conductivity, groundwater flow direction and gradient, lithology porosity, depth to groundwater, and plume configuration. At this site, with hydraulic conductivity ranging from $1.5 \times 10^{-4}$ to $3.5 \times 10^{-4}$ cm/sec, groundwater could only be effectively treated in situ by artificially creating a more permeable treatment zone (i.e., a trench), although at sites with higher hydraulic conductivity’s, treatment wells have been used.

**Specific Microbial Fence™ Design and Installation**

The Microbial Fence™ system designed for this area incorporated the technique of adding oxygen to site groundwater via a series of wells within a trench. The dissolved oxygen content in the trench groundwater would be increased to stimulate microbial activity and constituent biodegradation of the dissolved petroleum hydrocarbons without volatilizing the constituents. We determined that site-specific conditions such as groundwater flow rates and constituent concentrations...
were such that oxygen could be effectively introduced chemically, thus eliminating the need for the more expensive air blower method. Chemical introduction can be achieved by inserting oxygen release compounds (ORCs) down the wells within the trench. ORCs are composed of a proprietary formulation of a solid-phase magnesium peroxide enclosed in a streamlined polyester sock. Once hydrated, the ORCs slowly release oxygen into the groundwater over a period of weeks to months, via kinetics, leaving only inert magnesium hydroxide (Milk of Magnesia) remaining in the sock. Groundwater would subsequently exit the Microbial Fence™ with non-existent or very low concentrations of contaminants that would naturally degrade to background levels. It has been estimated that approximately three pounds of oxygen degrade one pound of benzene and approximately 2.5 pounds of oxygen degrade one pound of MTBE; these are actually conservative estimates because they do not account for biological reactions.

The most critical physical parameter to be calculated was groundwater velocity. Normal static groundwater levels were between one and three feet below grade, depending on the season. In order to compensate for the sand fill present in the near subsurface, a design hydraulic conductivity of 3.5 x 10^-4 cm/sec was used. This was a conservative design assumption in that groundwater does not flow through the shallow sand fill unless groundwater levels rise to less than one foot below grade, a situation that potentially occurs only a few weeks a year. The steepest hydraulic gradient (0.014 ft/ft) observed in several years of measurements from area monitoring wells was used in the conservative design calculations. The native subsurface lithology of the water table zone was estimated to have an effective porosity of 35%; thus, a maximum groundwater velocity of 1.4 x 10^-4 cm/sec was calculated.

The length (275 feet) and depth (8 feet) of the Microbial Fence™ was designed to physically extend beyond both the lateral and vertical limits of the plume. To calculate the trench width, the design organic loading within the UST Area groundwater was determined to be 2,000 µg/L of BTEX, 1,000 µg/L of TBA and 6,000 µg/L of MTBE. MTBE was used as the principal cleanup indicator parameter in the design because it had the longest half-life in the treatability study and was found at the highest concentration in the UST Area groundwater (5,830 µg/L). The trench width was determined by calculating the longest retention time needed to degrade the most tenacious organic compound (MTBE). In order to provide an extra factor of safety, the four-week (672 hour) half-life for MTBE from the Handbook of Environmental Degradation Rates was used to design the trench width. Because seven half-lives would be needed to degrade MTBE to below the conservative cleanup target concentration of 70 µg/L, the total retention time needed within the trench was 28 weeks or 196 days. Since groundwater velocity was 1.4 x 10^-4 cm/sec (or 0.0397 feet/day), the trench needed to be 8 feet wide to provide the required 196-day retention time.

The Microbial Fence™ was installed utilizing a backhoe in an orientation perpendicular to the direction of groundwater flow. The walls of the Microbial Fence™ were lined with filter fabric to prevent native sediment from washing into the trench and clean gravel was then emplaced to provide maxi-

Figure 3. Operational Microbial Fence™ completed with flush-mounted insertion wells, small diameter monitoring wells, and unhydrated (foreground) and hydrated (background and tied with nylon rope) solid-phase oxygen releasing compounds (ORC®) laid out during a scheduled changeout of the ORC®. Photograph by John W. Jengo, CPG-8193.
Microbial Fence™ Effectiveness Results

On the downgradient edge of the trench, several 2-inch diameter shallow ground water monitoring wells were installed to provide monitoring points within the Microbial Fence™. These wells can be sampled for nutrient analyses such as nitrogen, dissolved oxygen, microbial populations, and to determine the in-trench concentrations of contaminants in order to evaluate the effectiveness and replacement schedule of the ORCs. No pH control or addition of bacteria has been necessary to maintain a viable microbial population. Results from the first 1.5 years of sampling from within the Microbial Fence™ show the maintenance of a high concentration of dissolved oxygen, the complete elimination of toluene, ethylbenzene, and total xylenes, and a 64-87% reduction in the concentration of benzene and a 67-98% reduction in concentration of MTBE, depending on the monitoring location within the Microbial Fence™. Most importantly, the offsite wetlands receptor downgradient of the Microbial Fence™ was now protected from potential impact by hydrocarbon constituents.

Total O&M cost for the system, assuming the replacement of nine ORC® socks every six months (at $30/sock), is estimated at $540/year. Best of all, I know the Microbial Fence™ is "operating" 24 hours a day, every day of the year, and will continue to remediate the groundwater constituent plume in the most cost-effective and maintenance-free manner possible. For further reading and information regarding the application of these technologies, including controlled tests of the technique, see the following selected references:


John W. Jengo, CPG-8139, is Principal Scientist at Remediation Technologies, Inc. (RETec), King of Prussia, Pennsylvania 19406.

Acknowledgments: Raymond W. Talkington, CPG-7935 and Lawrence J. Barrows, CPG-9122.

NEW AIPG WEB SITE

AIPG will soon have a new web site at <aipg@aipg.org>. Members will need to call Headquarters to get their ID Number and Password to access the Members only portion of the site.

We look forward to your comments and suggestions on the new site.
Developing the Theis and Cooper-Jacob Solutions on the Same Graph

Michael Kasenow, Ph. D.

Ninety-seven percent of the world's fresh water supply is contained in economically-important subsurface aquifers. Most methods that are currently used to quantify this important resource are subjective, even when using a computer program. An aquifer test method developed by Theis (1935) determines transmissivity (T) and storativity (S) using the Theis correction factors, \( \mu \) and \( W(\mu) \), which correspond to drawdown (s) at a constant discharge (Q) over a specified time (t) and distance (r). For consistent units, the Theis solution can be expressed as

\[
T = \frac{Q}{4\pi s} \quad W(\mu) = \frac{4T \mu}{r^2}.
\] (1), (2)

Application of the Theis solution invokes the following assumptions:

1) Discharge from the pumping well is instantaneous with decline in pressure.
2) The well's radius is small, and the well is screened throughout the aquifer's thickness.
3) Flow to the well screen is radial, horizontal and laminar.
4) The aquifer is homogeneous, isotropic, and of a uniform thickness.
5) The aquifer is confined, infinite and remains saturated during the entire aquifer test.
6) The aquifer is isolated from overlying or underlying leaky aquifers, local recharge, precipitation, irrigation, rivers, lakes and wetlands.

![Graph showing matching of Theis curve with drawdown data](image)

**Figure 1.** Matching the Theis curve with drawdown data to obtain mathematical variables (from McWhorter and Sunada (1977) and reprinted with permission of Water Resources Publications, LLC).

**Table 1. Example of the 54-page \( Z(\mu) \) Table developed by Kasenow (1995, 1997, 1998), from which the Theisian correction factors can be identified without the Theis curve. The values of \( \mu \) and \( W(\mu) \) in Figures 3 and 4 were selected from this part of the table (see underlined values).**

<table>
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<tr>
<th>( \mu )</th>
<th>( W(\mu) )</th>
<th>( \mu W(\mu) )</th>
<th>( Z(\mu) )</th>
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Although it is a common tool, the Theis solution is tedious, and subjective, because it requires two graphs, the matching of a constant curve to a plot of data, and a selected point to gather mathematical variables (Fig. 1). It is considered to be a best estimate. Until recently, no easy method has been developed to help confirm Theisian results. Cooper and Jacob (1946) did simplify the Theis solution by using a semilogarithmic graph, but their method has the limitation of an extensive pumping period (t) or short observation well distance (r). An aquifer analysis method developed by Sheahan (1967) and Kasenow (1995), utilizes the Cooper-Jacob semilog graphical solution to simplify and verify the accuracy of the Theis solution for confined aquifers. The Kasenow-Sheahan solution is independent of the Cooper-Jacob limitation, because it is Theisian, and therefore; only the Theis assumptions need to be satisfied. Their method allows results from both solutions to be reported on the same graph.

The Cooper and Jacob (1946) solution requires a semilogarithmic graph, and uses the following equations for consistent units and time-drawdown analysis (Fig. 2):

\[
T = \frac{2.3Q}{4\pi \Delta s} \quad \text{and} \quad S = \frac{2.25T_{1/2}}{r^2}
\]

\[\Delta s = \text{slope on the semilogarithmic graph over one log cycle of time, and } t_{1/2} = \text{theoretical time of zero drawdown at steady-rate. Kasenow (1995, 1997, 1998) developed the } \mu, W(\mu), \mu W(\mu) \text{ and } Z(\mu) \text{ Table that can be utilized with the } Z(\mu) \text{ equation and the Theis solution to estimate aquifer parameters without using the Theis curve. The solution is simple, because it only requires that drawdowns at } t \text{ and one-half of } t \text{ be known. The } Z(\mu) \text{ index is then calculated and } \mu \text{ and } W(\mu) \text{ identified. When the Theis assumptions are satisfied, especially those concerned with leakage and barrier boundary conditions, } T \text{ and } S \text{ can be solved without the Theis curve. To apply the } Z(\mu) \text{ method follow three easy steps:}

\text{Step 1: Use equation (5) to find } Z(\mu) \text{ for any convenient drawdown } (s) \text{ that has a matching drawdown at 1/2 the time } (s_{1/2}) \text{ (Fig. 3):}

\]
Step 2: Use the Z(μ) index to find matching μ and W(μ) values (example: Table 1)

Step 3: Use Theis equations (1) and (2) to solve for T and S (Fig. 3).

If time-drawdown data points fall on Δs, and do not deviate from Δs at late values of time, then the Theis assumptions are satisfied in regards to boundary conditions, and the Kasenow - Sheahan Z(μ) solution can be used with semilog graphical analysis. This approach allows for two solutions using a single graph (Fig. 4). In addition, the Z(μ) solution eliminates error resulting from the plotting of data and subjective interpretation of matching the Theis curve. Table 2 compares the Kasenow-Sheahan Z(μ) solution to historical, "real world" Theis curve solutions. It is clear from Table 2 that the Z(μ) solution can be used to help confirm Theis Curve and Cooper-Jacob results. The book "Introduction to Aquifer Analysis" by Kasenow (1997) offers much more detail along with the computer program "Aquifer Test Performance" (ATP) in regards to this and other methods.

Figure 4. Using the Kasenow-Sheahan Z(μ) solution with the Cooper-Jacob semilog time-drawdown graph. One graph can be used with two solution methods (from Kasenow (1997) and reprinted with permission of Water Resources Publications, LLC).

Table 2. Comparing the Kasenow-Sheahan Z(μ) Time-Drawdown results to "real world" historical Theis type curve results for all possible s₄ values. Kasenow-Sheahan results were calculated using the ATP computer program (Kasenow, 1997) and are in bold type (from Kasenow (1997) and reprinted with permission of Water Resources Publications, LLC).
Table 3. \(T\) and \(S\) calculated using the \(Z(\mu)\) time-drawdown method and the ATP Computer Program for all available points. Data source: Lohman (1972); \(r = 400\) ft, \(Q = 500\) gpm (from Kasenow (1997) and reprinted with permission of Water Resources Publications, LLC).

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<td>100</td>
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<td>0.00350</td>
<td>13,610</td>
<td>0.00020</td>
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</table>

Reported Mean: 13,587 0.00020

As Kasenow (1997) showed, when employed with the ATP Computer Program, this method can be used with imperfect drawdown data to quantify aquifer parameters and verify boundary conditions. When transmissivity (\(T\)) is consistent over time, the Theis assumptions are satisfied (Table 3). In addition, transmissivity is calculated for each drawdown, allowing for observation of anomalous values. In essence, the \(Z(\mu)\) method can be used as a predictive tool. When \(T\) decreases over time, a boundary condition can be inferred. If \(T\) increases over time, leakage into the aquifer from some external source is often implied. Kasenow (1997) has also showed that a Thiesian distance-drawdown solution can be developed using the \(Z(\mu)\) method (Fig. 5), which can substantiate the semilog distance-drawdown solution, and in many cases, offer more accurate estimates of aquifer parameters when the Cooper-Jacob limitation is violated (Table 4).

The Kasenow-Sheahan \(Z(\mu)\) solution should not be considered a replacement for conventional graphical analyses, rather, this is another method that should be used to supplement such evidence. This is what Cooper and Jacob said about their method in 1946. Results using any method are only an approximation, but when hydrogeologists estimate aquifer parameters in regard to water quantity or for modeling of ground-water flow, that estimation should be as accurate as possible. This method can help to verify aquifer parameters and boundary conditions, which increases confidence when reporting results.

### References


Cooper, H.H., Jr., and Jacob, C.E., 1946. A generalized graphical method for...
Table 4. Comparing the Kasenow-Sheahan Z(μ) Distance-Drawdown results to “real world” historical Theis type curve results. ATP-Z(μ) Computer results are in bold type. It is clear that the Z(μ) solution offers estimate verification.

<table>
<thead>
<tr>
<th>Method</th>
<th>Data Source</th>
<th>t (min)</th>
<th>T (gpd/ft)</th>
<th>S</th>
<th>T (gpd/ft)</th>
<th>S</th>
<th>T (gpd/ft)</th>
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<td>101.831</td>
<td>0.00019</td>
<td>100.464</td>
<td>0.00020</td>
<td>99.305</td>
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<td>NA</td>
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<td>0.24</td>
<td>150.696</td>
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<td>600</td>
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<td>12,500</td>
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<td>12,454</td>
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<td>Kasenow (1995)</td>
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<td>0.0019</td>
<td>52,385</td>
<td>0.0018</td>
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</tr>
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</table>

NA: Not applicable, Cooper-Jacob limitation was violated.


Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage. Transactions of the American Geophysical Union, vol. 16.


Dr. Kasenow is the staff hydrogeologist at Eastern Michigan University, in the Department of Geography and Geology, Ypsilanti, Michigan, 48197. He is the author of seven books and over forty publications in regards to aquifer analysis.

Acknowledgments: Lawrence J. Barrows, CPG-9122, Dale H. Rezabek, CPG-9285, and Mark B. Sweatman, CPG-8698.

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**SURVEY**

**AIPG DIRECTORIES ON THE INTERNET**

Several Members have expressed interest in establishing on our forthcoming new Web site an AIPG General Membership Directory and Special Purpose Directories, e.g., Consultants, Individual Industries, Fields of Practice, etc.

A similar survey conducted in conjunction with your 1997 Annual Dues statement, drew extremely positive, but very limited response. It was thought that the limited response was owing to the limited number of Members who were, at the time, connected to the Internet. We believe that this situation has changed in the past 21 months. Therefore, we are repeating the survey at this time to give the Executive Committee some direction for planning.

Please mail, fax or e-mail your response

YES _____ or NO _____ to AIPG Headquarters.

Your comments will be welcome.
MAY 1998

- Congressional Exhibition of NSF-Sponsored Research
- Senate Takes Action on NSF Nominee, Authorization
- Appropriations Underway Without Final Budget Resolution
- USGS Releases New Resource Estimates for ANWR
- WIPP Nuclear Waste Disposal Site Set to Open in June
- New Asbestos Study Questions Cancer Risk
- AIPG Stages Second Washington Fly-In
- Climate Change, Government Affairs Forums at AAPG
- Web-based Geotrek Catalog Launched
- Tentative Schedule of Upcoming GAP Activities
- New Material on Web Site

Congressional Exhibition of NSF-Sponsored Research

For the third year in a row, AGI and the American Geophysical Union joined forces to sponsor a booth at the Coalition for National Science Funding’s Capitol Hill exhibition and reception showcasing research and education projects supported by the National Science Foundation. The event took place in the Rayburn House Office Building and was attended by a dozen Members of Congress and over 100 congressional staff. At the AGI/AGU booth, Paul Mayewski and Mark Twickler from the University of New Hampshire’s Climate Change Research Center explained the lessons learned from ice-core research over the past decade as well as what they hoped to gain from future investigations. In addition to the AGI/AGU booth, member society National Association of Geoscience Teachers hosted a booth Working Toward More Effective Teaching in the Geosciences that featured its NSF-sponsored projects for undergraduate faculty enhancement and a distinguished lecture series.

Senate Takes Action on NSF Nominee, Authorization

In other NSF-related news, the Senate confirmed Dr. Rita Colwell as the new director of the National Science Foundation on May 29th. Colwell is currently the President of the University of Maryland’s Biotechnology Institute and a Professor of Microbiology at the university. Dr. Colwell holds a Ph.D. in marine microbiology from the University of Washington. For those following congressional efforts to create a semi-autonomous National Institute for the Environment within NSF, Colwell was until her nomination on the Board of the Committee for NIE. Colwell’s predecessor at NSF, Neal Lane, is expected to be confirmed as the President’s science advisor in the next few weeks.

On May 12th, the Senate passed an NSF authorization bill for FY1998-2000. It authorizes $3.505 billion for NSF in 1998, providing the same 7.2% increase contained in the NSF authorization bill that passed the House in April. For fiscal year 1999, the bill authorizes $3.773 billion, and $3.886 billion in FY 2000. The bill is similar to a version (HR 1273) passed by the House last year, and the bill is expected to pass the House without debate.

Appropriations Underway Without Final Budget Resolution

The normal flow of the budget process is that the President releases the Administration’s budget, the House and Senate both pass budget resolutions in March, these resolutions are reconciled in April, then the appropriations committees in each chamber take over and draft appropriations bills. It is hard to recall the last time the budget process was normal. This year, the Senate passed its rather moderate budget resolution for fiscal year 1999 in early April. The House, however, waited until June 5 to pass its resolution by a 216-204 margin. The House resolution — which was not introduced until mid-May — would cut more than $100 billion over five years and specifies four goals: pay down the federal debt, save Social Security, eliminate the “marriage penalty” tax, and shrink the federal government by 1 percent. The bill sets spending levels much lower than the Senate or Administration budgets.

Because the House resolution was announced so late, the Senate went ahead and allocated funds to the appropriations subcommittees, who are now working on appropriations bills. Geoscience-related subcommittee allocations break down as follows: Agriculture: $13.7 billion in budget authority, compared to $13.8 billion enacted in FY98; Energy and Water (includes DOE): $21.1 billion, compared to $20.7 billion in FY 98; Interior (includes USGS, MMS): $13.3 billion, compared to $13.8 billion in FY 98; VA, HUD (includes NSF, EPA and NASA): $70 billion, compared to $69 billion in FY 98; Labor, HHS, Education: $82.3 billion; Commerce, Judiciary, State (includes NOAA): $32.2 billion.

USGS Releases New Resource Estimates for ANWR

The USGS recently released a new assessment of the petroleum reserves available in the Arctic National Wildlife Refuge (ANWR). The study found that the 1002 area of ANWR contains between 11.6 and 31.5 billion barrels of oil, which is considerably higher than the results of their last major assessment conducted a decade ago. The USGS says the increase results from improved resolution of seismic data — which indicated a larger number of petroleum accumulations — and new information about petroleum occurrences in nearby wells drilled since the previous study. The analysis also used new geological data and the discovery of new oil fields in the area. In addition, the new study found that most of the oil is concentrated in the western part of the area. The report, which is available on the USGS website <http://energy.usgs.gov/factsheets/ANWR/ANWR.html>, also gives a mean estimate of 3.2 billion barrels of economically recoverable oil, similar to
figures in earlier estimates and higher than a preliminary estimate made in 1995 when opening ANWR for exploration was last proposed by Congress.

**WIPP Nuclear Waste Disposal Site Set to Open in June**

On May 13th, the Environmental Protection Agency announced that the Waste Isolation Pilot Plant (WIPP) had cleared a final bureaucratic hurdle and is ready to receive waste. More than two decades after it was initially proposed, this underground facility in bedded salt near Carlsbad, New Mexico may actually serve its purpose of interring plutonium-contaminated waste from the defense nuclear weapons complex. EPA gave WIPP the green light when it issued certification that WIPP meets standards to protect public health and the environment from the effects of radiation exposure and contamination. The May 20th publication of the EPA certification in the Federal Register initiated a 30-day waiting period before WIPP shipments and disposal operations can begin. The opening date is set tentatively for June 19. Environmentalists, however, have vowed to use legal action to block the waste shipments, and lawsuits are expected any day now.

**New Asbestos Study Questions Cancer Risk**

Asbestos removal is a $4-6 billion per year industry and continues to be the subject of numerous pieces of legislation. But a new study in the May 28th issue of the *New England Journal of Medicine*<http://www.nejm.org> suggests that regulations based on Environmental Protection Agency models that extrapolate from heavy industrial exposure may overestimate the risk of cancer from exposure to asbestos by an order of magnitude. The study tracked thousands of women in Quebec who live in the vicinity of chrysotile asbestos mines, finding no increase in lung cancer rates compared to other women in the province despite exposure to levels of asbestos dust many times above maximum limits set for asbestos workers. The results should hearten the many geologists who contend that regulations fail to distinguish between a number of unrelated asbestiform minerals, which have significantly different health effects. But the study’s conclusions met with sharp criticism from Philip Landrigan of Mount Sinai School of Medicine in New York, a long-time proponent of the EPA standards, who told *The Washington Post* flatly: “All forms of asbestos are carcinogenic.”

**AIPG Stages Second Washington Fly-In**

Members of the American Institute of Professional Geologists (AIPG) came to Washington in May for three days of meetings with Congress and federal agencies, as well as Washington-based issue groups. AGI was pleased to provide logistical support for the fly-in, and we applaud AIPG for its efforts to mobilize its members as active constituents on Capitol Hill. AIPG invites other AGI member societies to consider this event as a template for their own future efforts.

**Climate Change, Government Affairs Forums at AAPG**

At the AAPG Annual Convention in Salt Lake City, the Division of Environmental Geosciences held a special forum on “Global Warming: What are the Obligations of the Petroleum Industry?” The well-attended forum featured climatologists Richard Lindzen of MIT and Michael McCracken of the U.S. Global Change Research Program as well as petroleum industry executives David Jenkins of British Petroleum and Skip Mick of Marathon Oil. As part of ongoing effort to facilitate dialogue on this important issue, AGI provided underwriting support for the forum.

Also at the AAPG convention, Clint Moore organized a Division of Professional Affairs forum later in the week to discuss policy issues of concern to AAPG’s membership. Speakers included George Yates, chairman of the Independent Petroleum Association of America; Kansas State Geologist Lee Gerhard; Oklahoma State Geologist Charlie Mankin; and Dave Applegate of AGI.

**Web-based Geotrek Catalog Launched**

A key feature of AGI’s National Geoscience Data Repository System (NGDRS) project, the web-based catalog of data holdings, is now available to the public at <http://www.agiweb.org/NGDRS>. The NGDRS is a system of geoscience data repositories, providing information about their respective holdings accessible through a web-based supercatalog. The catalog lists the holdings of participating public and private geoscience data repositories. Users may browse and select data visually or through searches on specific criteria. The goal of the supercatalog is to provide users information about the vast holdings of geoscience data, the quality, quantity, and location of that data, as well as general information about the attribute fields of the data. The NGDRS project is jointly sponsored by the Department of Energy (DOE) and the petroleum industry and operated by AGI.

**Tentative Schedule of Upcoming GAP Activities**

The GAP Advisory Committee last met at the AAPG annual meeting in Salt Lake City on Saturday, May 16th. Minutes will be available in the near future.

- June 14-16, AASG Annual Meeting, Portland, ME
- June 30, PPP 2000 Forum, Washington DC
- July 29-31, CESSE Meeting, Chicago IL

**New Material on Web Site**

The following updates and reports were added to the Government Affairs portion of AGI’s web site <www.agiweb.org> since the last monthly update:

- Database Protection Update (5-25-98)
- Comprehensive Test Ban Treaty Update and Hearing Summary (5-22-98)
- Superfund Update (5-22-98)
- Update on Waste Isolation Pilot Plant (5-15-98)
- Advancement of Women in Science, Engineering, and Technology Development Act Update and Hearing Summary (5-14-98)
- AAAS Colloquium on Science & Technology Policy Summary (5-14-98)
- Natural Disaster Mitigation Hearing Summary (5-14-98)
- Global Climate Change Update and Hearing Summary (5-13-98)
• High-Level Nuclear Waste Update (5-12-98)
• Special Update: Energy Policy Heats Up
  (Posted: 5-11-98)
• Education Policy Update (5-11-98)
• Royalty-In-Kind Update and Hearing Summary
  (5-11-98)
• Mining Law Reform Update (5-5-98)
• Science, Math, Engineering, and Technology Education
  Update and Hearing Summary (5-4-98)
• House Basic Research Subcommittee Hearing on NSF
  Budget Request (5-4-98)
• Congressional Support for Science Funding Update
  (5-2-98)
• National Institute for the Environment Update (5-2-98)
• Geotimes Political Scene: ASTEROID IMPACT!
  NUCLEAR TEST! Why We Need Open Discourse and
  Data Access (5/98)
• Clean Air Act Ozone and Particulate Matter
  Regulations Update and Hearing Summary (4-25-98)
• Year of the Ocean Update (4-28-98)
• NRC Report on Health Effects of Exposure to Radon
  (4-28-98)

This monthly update goes out to members of the AGI
Government Affairs Program (GAP) Advisory Committee as
well as the leadership of AGI’s member societies and other
interested geoscientists as part of a continuing effort to
improve communications between GAP and the geoscience
community that it serves. Prior updates can be found on the
AGI web site under “Government Affairs” <http://www.agi-
web.org>. For additional information on specific policy issues,
please visit the web site or contact us directly at <govt@agi-
web.org> or (703) 379-2480.

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a greater number of people as well as increas-
ing awareness of important geological issues.

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Professional Geologist along with your name
and either a check, VISA or MasterCard num-
ber to AIPG, 7828 Vance Drive, Suite, 103,
Arvada, CO 80003-2125 • (303) 431-0831 • Fax
(303) 431-1332 • aipg@aipg.com.

Application Packages for Geological
Registration Available on the Internet

The Mississippi State Board of Registered
Professional Geologists announces that registration
packages are available at the following website address
http://geology.deq.state.ms.us/geologyreg

The application package contains all of the necessary
forms and required reading, which includes the Rules of
the Board and the codified law for application as a
Registered Professional Geologist (RPG) or Geologist-
In-Training (GIT). Application packages will also be avail-
able at regular meetings of the Mississippi Geological
Society. Should you not be able to attend these meet-
ings or do not have access to the Internet, the applica-
tion packages may also be obtained by requesting the
package from the Board at P.O.Box 22742, Jackson, MS
39225-2742, or by calling 601-961-5507 and leaving your
name, address, and phone number. However, please note
that the preferred option is to download the informa-
tion from the website.

The grandfathering period for applying for registra-
tion as a RPG or GIT terminates in December, 1998. The
general terms for qualifying under the grandfathering
provision are a minimum of a degree in geology with 30
semester hours or 45 quarter hours in geological course
work and 4 years of documented geological experience.
All those whose practice may affect the public’s health,
safety, or welfare as defined by 73-63-1 et seq.
Mississippi Code 1972, as Annotated, which is the
"Registered Professional Geologists Act of 1997," must
be registered with the Board in order to practice in
Mississippi. The Board is currently discussing comity
agreements with states, which will be of beneficial use
for those who become registrants in Mississippi, (i.e.
Mississippi registrant’s will not be required to be regis-
tered in a state for which comity has been established).
These comity discussions are in their early stages but
have been favorably received by the states that have
thus far been contacted. For those who have the degree
requirements but lack the experience qualification may
enroll as Geologist-In-Training.

Please note that if you are a geologist from a state
other than Mississippi and will be performing geologic
work which may affect the public as defined by the law,
you must be registered or have an application pending
with the Board. The law was effective as of July 1, 1997.
Additional information may be found at the previously
noted website or by calling 601-961-5507.
Definition of ‘Responsible Charge’
(Column 30, May 1998)

James H. Williams, CPG-374, Missouri State Geologist wrote, “I enjoyed your comments concerning ‘Responsible Charge.’ Also, I certainly agreed with John Howard’s article. I saw a number of examples in information furnished to us by some applicants for registration as geologists in Missouri.

I think in the Missouri Geologist Registration Board’s approach, and I know mine, ‘responsible charge’, has multiple levels of meaning. It can range from the field geologist who has the responsibility to decide where the next bore hole will be placed all the way up the ladder to the ‘Supreme Emperor Project Manager’ who made the decision to commit to the project. Where holes would be drilled is a part of that project. If the person logging samples makes a next bore hole decision based on the sample interpretations, that is responsible charge. The importance of such decisions on some projects may well be more significant than the person who carries the title ‘project manager’.

As the Missouri Board approached the matter, a person logging information from a boring, doing laboratory tests for geologic information and other similar types of work, but not having the responsibility to make decisions based on such work was not considered to be in responsible charge. Thus, one could have a 10-year veteran of such work not having responsible charge authority or recognition. By comparison, a three-year junior geologist having the authority to say ‘move the rig over there’ would be in responsible charge.

“I do not think one can define ‘responsible charge’ based on a management level within an organization. Rather it is the specific responsibility of an individual and management or supervisor oversight required to make sure the work of that individual is properly completed. The ‘responsible charge’ individual may supervise no one or could supervise hundreds of people. The fiscal management authority may range from buying lunch to a multi million dollar project responsibility.

‘Resumes and reference sources can conceal many blemishes. A reference source may be trying to ease someone out of the organization, a kissing cousin, or perhaps simply biased because of the reference source’s personality. However, if one has several reference sources with responsible charge comments with great variation in their comments, there is a warning signal to examine the credentials of the person in question more carefully. All this is even more difficult than deciding where to bore the next hole.”

Williams points out that “responsible charge” requires the ability to make decisions. His example contrasting the individual with 10-years’ experience but not decision-making authority with the 3-years’ experience individual with the authority to site the drill rig brings the distinction into sharp focus. Williams also points out that there are levels of ‘responsible charge’ from the individual responsible solely for his/her own professional decisions to the “Supreme Emperor Project Manager.” Nevertheless, trying to sort through applications and resumes to determine what an individual has really done and what he/she was really responsible for remains a practical problem. Williams notes that reference letters can assist. But with the common view that resumes should not exceed two pages and the fear that any unfavorable comments in a reference letter will be grounds for a lawsuit, getting thorough information frequently requires thorough digging.

AIPG requires applicants for certification to have 8 years of experience.1 The question of what qualifies as acceptable experience has been perhaps the thorniest issue involving what are termed ‘problem applications’ over the years. In a forthcoming TPG article, Robert A. Levich, CPG- 6477, Chair of the National Screening Committee (NSC), describes the evaluation of experience. “Generally, the NSC considers all field and laboratory work; all data collection, manipulation, evaluation and analysis; all relevant training; and all administration and management (including personnel supervision) that support geologic work as 100% geology. However, if a portion of the applicant’s work is non-geologic in nature (e.g., asbestos removal from structures), it and all its supporting functions (managerial, contractual, etc.) does not count as geological experience.” While geological experience is not exactly synonymous with ‘responsible charge’, the types of activity qualifying as geologic experience, with the exception of training, generally appear to involve responsible charge as defined by Williams. Likewise, Levich’s example of what does not qualify as acceptable experience, asbestos removal, would not be work qualifying as having geologically ‘responsible charge.’ Good descriptions of the type of work done are required in any case.

Further comments on what constitutes ‘responsible charge’ are encouraged.

When Does Duty to the Public Supercede Duty to the Client?

Consider the situation of geologist who studied a tract proposed for real estate development and identified areas of inactive landslides. The geologist’s report outlined the areas on a tract map and recommended that the area be used for open space land rather than being used for home sites.

1. A master’s degree can satisfy one of the eight required years and a doctorate two.
Subsequently, the geologist learns that homes are being built on the area reported on as being unsuitable for building. What should the geologist do, if anything?

I recognize that additional facts may considerably alter your answers but I believe that discussions of the variations in facts will be quite useful in the discussion. In addition, I am looking for discussion on the resolution of conflict, if you see one, between the following parts of the AIPG Ethics Code.

CANON 2. Obligations To The Public: Members should uphold the public health, safety, and welfare in the performance of professional services, and avoid even the appearance of impropriety.

Rule 2.1.3: If a Member becomes aware of a decision or action by an employer, client, or colleague which violates any law or regulation, the Member shall advise against such action, and when such violation appears to materially affect the public health, safety, or welfare, shall advise the appropriate public officials responsible for the enforcement of such law or regulation.

CANON 3. Obligations To Employers And Clients: Members should serve their employers and clients faithfully and competently within their overall professional and ethical obligations.

STANDARD 3.2: Members should protect, to the fullest possible extent, the interest of an employer or client so far as is consistent with the public health, safety, and welfare and the Member's legal, professional, and ethical obligations.

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.

At what point does one's obligation to protect the public's health, safety, and welfare supersede one's obligations to one's client? Or, when is it ethically permissible to "blow the whistle"? What are the consequences of "whistle blowing"? How should the fact that the geologist has a mortgage to pay and kids to educate affect the geologist's decision? And, how should that geologist's action or inaction be judged and sanctioned, if such is warranted? Would you hire the geologist who was involved in this situation?

Scope of the Code of Ethics: Application to Management Activity (column 31)

In last month's column, I described the management activities of a geologist who served as the president of a natural resources company and who was "found to have actively been involved" in financial reporting violations. These activities resulted in his being sanctioned both under the securities laws and a professional ethics code. In discussing this situation at a meeting of the Wyoming Section, I realized that I had not made clear that the geologist's participation in the financial reporting violations resulted from his supplying company accounting records which he knew contained inappropriate and misleading allocations of accounts. His is not a case where his activities involved professional accounting. Rather, he cheated on a big way on the company's expense reports. I want the example to make clear that the geologist's activities involved not the accounting profession but the business aspects of geologic practice.

We practice geology but we do so as a profession, as a means of financially supporting ourselves. This necessarily involves us in the need to account for our time and expenses, to submit either invoices or the documentation required to support invoices, to act when we are not paid, to keep tax records, etc. If we manage others on a project, we need to ensure that our colleagues are keeping the records for which they are responsible, to watch the project's budget, to conduct performance reviews, to take various other personal actions when warranted, "Et cetera, et cetera, et cetera" (to quote the King of Siam). The point is that practice of geology, regardless of our employer (self, company, or government), requires us to engage in all kinds of "business" activities which are not described in our geology textbooks. Is the fact that these "business" activities are interwoven into our geological practice sufficient to bring these activities within the scope of the AIPG Code of Ethics? Where is the line between professional geology and everything else.

Let's consider a different example. A consulting geologist discusses doing a particular project with a client in a series of telephone calls and letters. However, the geologist and client never conclude a formal, written agreement of what each expects of the other. This results in part from the fact that the work must begin promptly so that it can be completed within a regulatory time limit. The work is done in a professional manner sufficient to meet the needs of the regulatory agency, which was the geologist's understanding of the scope of the work. The client had hoped that the geologist would produce a far more comprehensive report. Furthermore, because the original "agreement" was for a fixed price, the geologist did not feel the need to keep track of his time and expenses on the project. Further, subsequent regulatory changes eliminated the need for follow-up work, which had been included in the original "agreement" and the "agreement" was consequently terminated.

Subsequently a dispute arose regarding whether the geologist had adequately completed the scope of work contemplated prior to the regulatory change and what compensation should be paid. The client, asserting that he had not received the comprehensive report he wanted, contended that a report which he had received was of little to no value. The geologist, asserting that the report submitted was indeed more than sufficient to cover the regulatory requirements for which the work was initially done, contended that compensation recognizing the time and expenses incurred should be paid.

What problems do you see arising from this example? How would you avoid them? Was the geologist acting in a truly professional manner? Why or why not? We all, like the geologist in the example, enter into agreements to perform work with the best of intentions. Sometimes, as in the example, things don't work out. What sorts of things should a professional geologist do to provide support for one's position in those cases which turn out differently than expected? The problem here
is not in the character of the geologic work performed per se but rather in the administration of the geologic work. Are such problems within the scope of AIPG’s Code of Ethics? If you believe they are, did the geologist in the example violate the Code? If you believe so, what specific section was violated?

The Ethical Use of Statistics

The American Statistical Association (ASA) recently published a draft code regarding the ethical use of statistics on the ASA website, <www.amstat.org/about/ ethics.html>>. While this draft code is specifically applicable to the ASA, it recognizes that statistics are widely used in other professions and that the ethical use of statistics ought to be encouraged by all users of statistics regardless of whether they are ASA members. Thus all users of statistics have been invited to comment on the ASA’s draft code by October 15, 1998.

The Preamble contains three sections, the second of which, Statistics and Society, states in part: “The professional conduct of statistical analysis is essential to many aspects of society. ... Scientific and engineering research in all disciplines require careful design and analysis of experiments and observations. To the extent that uncertainty and measurement error are involved—that is, in most research—experimental design and analysis are crucially dependent on statistical methods. Even in theory, much of science and engineering inherently involves statistical variability.”

The third section, Shared Values, begins: “Because of the dependence of society on sound statistical practice, all statistical practitioners have social obligations to perform their work in a professional, competent, and ethical manner. This document is directed to those whose primary occupation is statistics. Still, the principles expressed here should also guide the statistical work of professionals in all other disciplines which use statistical methods. All statistical practitioners are obliged to conduct their professional activities with responsible attention to:

1. The social value of one’s work and the consequences of how well or poorly it is performed.
2. Pressures or temptations to slant statistical work toward predetermined outcomes. It is all right to advocate a position; it is not all right to misapply statistical methods to gain (only) an appearance of support for that position.
3. Statistics as a science. As in all science, understanding evolves. Statisticians have a body of established knowledge, but also many open issues which deserve frank discussion.”

The formal Ethical Guidelines contain many elements similar to elements of the AIPG Code of Ethics. However, the following elements of the ASA Guidelines address issues applicable to both statistics and to other forms of geologic study.

“A. Professionalism
1. Avoid data selection processes that are inconsistent with transparent treatment of the issues being studied.
2. Use only statistical methodology suitable to the data and to valid results.
3. Strive for valid practical significance, not just statistical significance.

4. Recognize that automated statistical computation alone does not constitute adequate statistical analysis; it is also necessary to understand the theory, the data, and the methods used in each statistical study.

7. Provide only such expert testimony as you would be proud to have peer reviewed.

“G. Responsibilities Regarding Allegations of Misconduct:
2. Recognize that differences of opinion and honest error do not constitute misconduct; they may warrant discussion but not accusation.
3. If involved in a misconduct investigation, know and follow prescribed procedures; maintain confidentiality.
4. Following a misconduct investigation, support efforts of the accused, the witnesses, and whistleblowers to resume their careers in as normal a manner as possible.
5. Do not condone retaliation against, or blackballing of, responsible whistleblowers.”

Should AIPG incorporate any of these ideas into it’s Code of Ethics? The AIPG Code of Ethics is not and should not be cast in stone; periodic review and modification are required. Anyone having specific suggestions is welcome to make them at any time. I urge anyone interested in the specific elements addressed above to obtain a copy of the ASA draft ethics code and comment on it directly to the ASA and to share those comments here.

Gemstones Discoveries Described

Two field reconnaissance reports on colored gemstone occurrences in Wyoming are being released because of public interest. They are titled, Field Reconnaissance of the Palmer Canyon corundum-kyanite-cordierite deposit, Laramie Mountains Wyoming; Wyoming State Geological Survey Mineral Report MR98-1, and Field reconnaissance of the Leucite Hills peridot (olivine) occurrence, Rock Springs uplift, Wyoming; Wyoming State Geological Survey Mineral Report MR98-2. The reports describe two potentially valuable gemstone occurrences, both of which were discovered by W. Dan Hauser, Senior Economic Geologist with the State Geological Survey.

The Palmer Canyon report describes a deposit of a transparent purplish-blue mineral known as cordierite. This deposit was found in 1996 west of Wheatland. The Leucite Hills report describes a different gemstone, known as peridot. Last year, Hauser discovered a deposit of this olive-green transparent mineral while he was mapping in the Leucite Hills north of Rock Springs. He found a group of anthills that were literally colored green due to the presence of peridot. From two anthills, more than 10,000 carats of peridot and industrial olivine were recovered. Although the size of the material from the anthills is less than 1/4 inch in length, the area may have potential for larger stones as nearby outcrops of lamproite contain olivine grains up to 1 inch across.

Copies of the reports can be purchased from the Wyoming State Geological Survey in Laramie.

JULY 1998 • The Professional Geologist
The Second Annual Washington, DC Fly-In

James D. Shotwell, CPG-8290, Chair, National Affairs Committee and Stephen M. Testa, CPG-6464, President, American Institute of Professional Geologists

One of the five basic purposes of AIPG is the "representation of and advocacy for the geological profession before government and the general public." As part of its mission to represent the geological profession in the government affairs arena, the National Affairs Committee, formerly the National and International Affairs Committee which was bifurcated into separate committees starting this year, organized the second annual AIPG Washington, DC Fly-In, which took place during the week of May 3, 1998. The Fly-In was again successful in advocating the profession of geology before Congress, federal agencies and private organizations on a broad range of issues of interest to the profession.

The following participants invested their own time and money to play an advocacy role for the profession: Eugene Aleshin (Maryland), Ron Alexander (Kentucky), David Applegate (Virginia), John J. Dragonetti (Virginia), Thomas G. Fails (Colorado), Dawn H. Garcia (Arizona), Gerard P. Kashatus (Maryland), Michael D. Lawless (Virginia), Charles J. Mankin (Oklahoma), Janine S. Mauersberg (Maryland), Jonathan G. Price (Nevada), James D. Shotwell (Texas), Stephen M. Testa (California), Larry D. Woodfork (West Virginia). Kasey Shewey of the American Geological Institute also participated. Please contact any of these participants for more information regarding the Fly-In.

Wendy Davidson of the AIPG National Headquarters staff worked with President Stephen Testa to prepare a tri-fold flyer which was delivered to those with whom we met. The flyer summarizes AIPG purposes and official policies, and is available from AIPG National Headquarters. The flyer states that "the common themes found throughout AIPG's representation of the geological profession are that the science of geology is vital to the interests of the nation, both domestically and internationally, in times of peace and for national security, and that, to best protect public health, safety and welfare and to assist in the effective administration of government programs in which geology plays a prominent role, the science of geology should be practiced by qualified geoscientists."

With this mission in mind, we met with the Chief Geologist and Chief Hydrologist of the U.S. Geological Survey (USGS), the Director of the Division of Earth Sciences of the National Science Foundation (NSF), the U.S. Chamber of Commerce, the Environmental Protection Agency, the

Top row: Tom Fails, David Applegate, Steve Testa, Jim Shotwell, John Dragonetti, Dawn Garcia.
Bottom row: Charles Mankin, Ron Alexander, Mike Lawless, Gene Aleshin.
U.S. Army Corps of Engineers, the Department of Energy (DOE), the Office of Water and Science at the Department of Interior (DOI), various key Senators, Representatives and members of the congressional staff, the Ecological Society of America, the Committee for the National Institute for the Environment (CNIE) and the National Society of Professional Engineers as well as the American Society of Civil Engineers.

The issues we discussed at these meetings were numerous. In our meeting with the USGS, Dawn Garcia of the Arizona Section of AIPG presented a letter to Dr. Robert M. Hirsch, Chief Hydrologist, which expressed the Section's concern that the USGS Water Resources Division (WRD) is competing with the private sector, such as consulting geologists. The Arizona Section's letter has helped facilitate a dialog with the WRD, which has already spawned an early June meeting in Flagstaff among private sector geologists and representatives of the USGS-WRD. We also learned of the Survey's intent to use more private sector contractors for local geologic studies, and to assume a leadership role in the electronic publication of geologic journals and literature. Finally, we offered our assistance in promoting the Survey before Congress, especially with respect to budgetary issues such as the funding of the newly reauthorized National Geologic Mapping Act.

We learned of the plans of the Regulatory Branch of the U.S. Army Corps of Engineers to work with the States and local governments to formulate watershed plans for wetlands and riparian areas. This will involve identifying what waters are of high value, what areas can be filled with minimal impact, and what areas can be restored to wetlands and riparian habitat. The Corps is hoping to put more attention in the future on such geological issues as sediment load, bed load, and headward downcutting of streams. The Corps also is planning to implement a wetlands certification program (with decertification, as appropriate). We expressed our view that qualified geoscientists should take a leading role in these programs and that AIPG is in the process of developing an official wetlands policy, which we will communicate to the Corps.

In our meeting with Dr. David Blockstein, Chief Scientist of the CNIE, we were updated on the decision by the NSF Board of Directors not to include the CNIE in the NSF. The CNIE is evaluating future courses of action to accomplish their mission. We again seized the opportunity to stress the importance of sound geologic input to the programs proposed by the CNIE. We expressed our concern that the CNIE's goal of creating an environmental electronic library would erode the function of the USGS as the premier geoscience library.

Our meeting with Dr. Mark Schaefer, Assistant Deputy Director of the Office of Water and Science at DOI was informative regarding geoscience funding, geoscience prioritization, budgetary erosion due to inflation and a possible additional mechanism for addressing AIPG concerns about USGS competition with the private sector. The budgetary issues at the DOI will be the subject of a future article in the "The Professional Geologist (TPG)."

In our meetings with the engineering organizations we discussed the newly adopted AIPG Policy On The Exercise Of Professional Judgment and our concerns about prescriptive ASTM Standards, especially with respect to Superfund reauthorization. We also proposed the development of national guidelines on appropriate professional responsibilities between geologists and engineers.

We invited many of the people with whom we met to attend the AIPG National Convention in Baton Rouge and to write articles for the TPG. Additional themes that were common among many of our meetings were the support of Senate Bill 1305, which calls for a doubling of the amount of money for basic scientific research. Senate Bill 1305 is a "feel good" Bill which has no funding at this time. We supported the full funding of the National Geologic Mapping Act and the National Geologic Data Repository, and we voiced our concerns about the Kyoto agreement and the issue of climate change (for which AIPG is forming an ad hoc committee) and resource access on public lands for mineral exploration and extraction.

In the coming months the National Affairs Committee will be creating subcommittees to address most of the issues presented above. Initially we intend to create subcommittees on Professional Practice, On Competition, on NSF Grant Reviews and on the USGS. The creation of these subcommittees will serve to bring more AIPG members into the advocacy arena, create more continuity in the National Affairs Committee and proactively promote issues of importance to AIPG membership before our federal government and agencies and other national organizations. President-Elect Thomas G. Fails is already planning the Third Annual Washington, DC Fly-In in 1999. We encourage you to contact us and become a part of the advocacy process.

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Members of the Executive Committee and/or the Headquarters staff will participate in the following meetings, which provide opportunities for AIPG Members to exchange ideas with the Executive Committee and staff. We also welcome invitations from AIPG Sections to discuss AIPG programs and goals. If your Section would like to meet with members of the Executive Committee or Headquarters staff, please contact Headquarters to schedule a convenient time. Thank you.

Jul. 6-17: Arvada, Colorado
Jul. 20-23: Las Vegas, Nevada
Oct. 11-14: Taos, New Mexico
Sep. 28 - Oct. 2: Seattle, Washington
Oct. 3-8: Baton Rouge, Louisiana
Oct. 16-18: Charleston, South Carolina
Oct. 25-29: Toronto, Ontario, Canada
Nov. 11-13: Las Vegas, Nevada

Executive Committee “Virtual Meeting” (e-mail and fax)
National Council of State Legislators (President Testa, President-Elect Fails and Executive Director Knight)
AAPG-DEG Conference and AIPG New Mexico Section (President Testa and President-Elect Fails)
AEG Annual Meeting (President Testa)
AIPO Annual Meeting (Executive Committee and staff)
ASBOG Annual Meeting (President-Elect Fails)
GSA Convention (President Testa, President-Elect Fails and staff)
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Sep. 30 - Oct. 4. AEG Annual Meeting, Earthquake Hazard Maps and their Applications, Seattle, Washington. Contact: Yumei Wang, Oregon Dept. of Geology, 800 NE Oregon St., #29, Portland, OR 97232, Ph.: (503) 731-4100, Fax (503) 731-4066, email: meimei.wang@state.or.us

Oct. 3-8. AIPG National Annual Meeting, Professional Geology, Mineral Resources and Our Environment, Baton Rouge, LA. Contact: M.B. Kumar, Gen. Chir., P.O. Box 19151, Baton Rouge, LA 70893, Ph.: (504) 342-5501.


Oct. 19-22. Australia's International Mining & Exploration Exhibition (AMEX), Sydney, Australia. Contact: Gene Sanders, REC, 383 Main Ave., Norwalk, CT 06851, Ph.: (203) 840-5570.


Oct. 21-23. GCAGS 48th Annual Convention - Bridging the Gulf: To New Growth, To the New Millennium, Corpus Christi, TX. Contact: AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101-0979.


Nov. 5-7. AAAS Conference in South Dakota to establish network of researchers in Great Plains states, Sioux Falls, SD. Contact: Ellen Cooper, Ph.: (202) 320-8431.


Nov. 12-17. AAAS Epic of Evolution Conference, Chicago, IL. Contact: Dave Amber, Ph.: (202) 326-6434.

Nov. 21-23. AAAS Conference on Guidelines for Anonymous Interplay on the Internet, Irvine, CA. Contact: Dave Amber, Ph.: (202) 326-6334 or http://www.aaas.org/appp/anon


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Send notices of meetings of general interest, in format above, to Editor, TPG, 7828 Vance Drive, #103, Arvada, CO 80003, e-mail: wyd@aipg.org.

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VA-Johnson, Brent E.
SA-0101
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VA-Maynard, Jessamy A.
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VA-McMahon, Aaron M.
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SA-0104
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