



Arizona Geological Society Newsletter

SEPTEMBER 2012

September 4, 2012 DINNER MEETING

- Who:** William H. Wilkinson will be our featured speaker. See abstract below.
- Where:** Sheraton Tucson Hotel and Suites, 5151 East Grant Road, (at intersection of Grant and Rosemont on the North side of Grant in the **PIMA BALLROOM** (enter at northwest corner of the building) and go upstairs to the meeting room.
- When:** Cash Bar at 6 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.
- Cost:** Members \$24, guests \$27, Students free with online reservation (\$10 without).

RESERVATIONS are REQUIRED: CALL 520.663.5295 by 5 p.m. by Friday, August 31 or reserve on the AGS website (www.arizonageologicalsoc.org). Please indicate regular (Tri-peppercorn crusted flank steak with sautéed mushrooms and mashed potatoes), vegetarian, or cobb salad meal preference. Please cancel by Monday, September 3 at 8 a.m. if you are unable to attend—no shows and late cancellations will be invoiced. Meals for walk-ins may be available (with a \$3 surcharge), but cannot be guaranteed.

The September dinner meeting is sponsored by:



FREEPORT-McMoRAN COPPER & GOLD

AGS is grateful for the sponsorship, which helps us to offset dinner meeting costs. Learn more about Freeport-McMoRan Copper & Gold at www.fcx.com.

Mineral Exploration and Challenges in Africa

William H. Wilkinson

Vice President, Africa, Freeport-McMoRan Exploration Corp.

As the world's second largest copper producer, Freeport-McMoRan Copper & Gold Inc. produces about 3.5 billion pounds of copper per year. The prime goal of Freeport's exploration teams is to identify reserves to replace those that are mined each year. Sediment-hosted copper deposits account for about 23% of the world's copper production and resources, and they are important sources of Co and Ag and minor amounts of Pb, Zn, U, Ni, PGE, and Au. Sediment-hosted copper deposits can be quite large. Data from 124 sediment-hosted deposits worldwide show that 15% are giants (>2 Mt contained copper) and 7% are super giants (>24 Mt contained copper) (Hitzman *et al*, 2005). The Central African Copper Belt contains about 17% of the world's copper production and resources from sediment-hosted deposits. Therefore exploration in Central Africa provides a good opportunity to develop deposits that will make a significant difference to Freeport's reserves.

Political and personal risks are evaluated when deciding where to explore in Africa. Ultimately, though, one must go where the copper is. I will review some the sediment-hosted deposits as well as other deposit types of interest to Freeport and highlight the challenges, as well as the rewards, of exploration in Africa.

ABOUT THE SPEAKER

William H. Wilkinson is Vice President, Africa, for Freeport-McMoRan Exploration Corp. in Phoenix, Arizona. He is responsible for project direction, reconnaissance and acquisitions throughout Africa. He has nearly 38 years of experience in mineral exploration and has worked in base and precious metal exploration in 25 countries on five continents.

Wilkinson received his B.S. and M.S. degrees in geology from the New Mexico Institute of Mining and Technology, with a three-year break for service in the U.S. Army. He received his Ph.D. degree in geosciences in 1981 from the University of Arizona. Wilkinson has worked in the southwestern United States for Anaconda, Duval Corporation, Westmont Mining and Phelps Dodge. He is a member of the Society of Economic Geologists, Mining Foundation of the Southwest, Mining and Metallurgical Society of America, Arizona Geological Society and Nevada Geological Society. He is a Certified Professional Geologist of the American Institute of Professional Geologists and a charter Registered Member of the Society for Mining, Metallurgy, and Exploration (SME). He was the 2009 President of SME. Wilkinson is an active AGS member, having served on the AGS Executive Committee in several capacities, including President (along with Jim Briscoe) in 1987.

Wilkinson has been an avid mineral collector since the fourth grade, which provided the impetus to study geology leading to a great and satisfying career in the mining industry.

ANNOUNCEMENTS

Arizona Oil and Gas will have two booths at the Cochise County Fair to meet local ranchers and farmers, hand out information, and lease oil and gas rights for their North Douglas and Moore projects which total 42,000 acres. The fair runs from September 27-30. Arizona Oil and Gas hopes to educate the citizens of Cochise County regarding their oil and gas leasing activities and their plans to explore for oil and gas in Cochise County in 2013. A geologist and legal counsel will be on site to answer questions regarding the geology, remote sensing exploration methods, and the leasing program.

FIELD TRIPS!!

AGS members can look forward to the following trips:

- **September 15:** Rosemont Copper Project Tour. Joint AGS-Student field trip. Register online at www.arizonageologicalsoc.org. The trip is free, and Rosemont will provide lunch. Additional details to be announced on the AGS website.
- **October 6-7:** Wickenburg area to visit the Vulture Mine on Saturday, the Anderson Mine on Sunday, and other stops of interest along the way. Additional details will be available on the AGS website as plans develop.
- **November 10:** A joint AGS-AIPG field trip, led by Steve Reynolds, Professor of Geology at Arizona State University, will take place in the Dreamy Draw area of the Phoenix Mountains to examine aspects of Proterozoic evolution. In the afternoon, we'll head into the South Mountains to visit spectacular exposures related to mid-Tertiary extension.
- **TBA:** A possible tour of the Commonwealth Mine (near Pearce-Sunsites) late in 2012 or early next year.

Please keep checking the AGS website for more information and to sign up for these trips.

Alison Jones has a few spots left on an 8-day Geology raft trip through the Grand Canyon on July 29-August 5, 2013. Email her for more information at ajones@clearcreekassociates.com.

Thanks to the following AGS members for their generous donations to the Courtright Scholarship Fund:

Charles Ferguson

Arlan Ruen

Welcome New AGS Members

Norman Carlson, Zonge International, Inc., Tucson, Arizona
 Joann Deakin, Cochise Community College, Sierra Vista, Arizona
 Stanley Evans, Retired, Tucson, Arizona
 Matthew Germanson, Vane Minerals, Flagstaff, Arizona
 Brett Marsh, Kiska Metals, Mesa, Arizona
 Thomas Rautert, Tucson, Arizona
 Craig Reinbold, Student, University of Arizona, Tucson, Arizona
 Alan Richter, Geotemps, Oro Valley, Arizona
 Ted Rupp, Retired, Tucson, Arizona

2012 MEMBER DIRECTORY STATUS

The AGS Member directory is in press and will be mailed to current members and advertisers in early September. Please make sure we have your correct address as the directory is sent by bulk mail, and thus it will not be forwarded by the post office in the event of a changed or incorrect address.

AGS is grateful for the support of our advertisers who completely offset the production costs, thereby providing additional support for our student members.

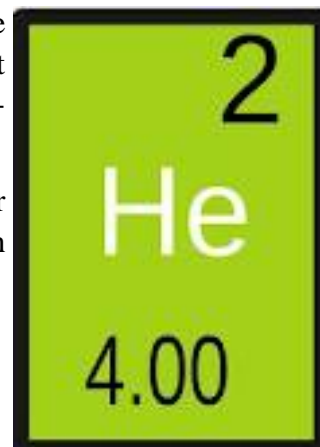
Helium: Supply Shortages and the Economy, National Defense, and Manufacturing

On July 20, 2012, the House Committee on Natural Resources Subcommittee on Energy and Mineral Resources had a hearing regarding the impacts of the helium supply shortage. Helium is used in a variety of industrial and medical applications, including LCD screens, cooling (nuclear reactors, reactions for petroleum, and natural gas and coal processing), and in magnetic resonance imaging (MRI) machines. The supply of helium has been fairly steady because the Bureau of Land Management (BLM) operates a helium reserve. This reserve will not be funded after next year, and private industry has not yet developed new domestic sources. American companies that purchased helium from the reserve will have to rely more on foreign helium from Algeria, Qatar, and Russia if stable domestic supplies are not developed.

Wyoming, Arizona, and New Mexico have significant helium reserves that can be economically mined, according to experts who testified during the hearing. The helium shortage is not a result of geologic shortfalls, but rather, due to the fact that there has been no incentive for others to develop the resources and the necessary infrastructure. The relatively inexpensive reserves available from the BLM have prevented others from doing so. Now that the reserve is closing, there will be some instability until new sources are established.

The question of whether the US should maintain a "strategic helium reserve" for defense and emergency use was broached during the hearing. The idea met with support.

A more complete summary of the hearing can be found on the American Geosciences Institute website at: http://www.agiweb.org/gap/legis112/miningetc_hearings.html#jul20



Curiosity on Mars!

In November 2011, the Mars Science Laboratory (including the rover, named Curiosity) was launched aboard an Atlas rocket. It landed on the red planet in August. The feat of engineering that it took to successfully land the rover can't be overrated. There was very little room for error. Now that the engineers have delivered the laboratory to Mars, it's time for the geologists to get down to work.

The laboratory was designed to assess whether Mars ever had an environment able to support microbes. According to the Jet Propulsion Laboratory website, "the rover carries the biggest, most advanced suite of instruments for scientific studies ever sent to the martian surface. The rover will analyze samples scooped from the soil and drilled from rocks. The record of the planet's climate and geology is essentially 'written in the rocks and soil'—in their formation, structure, and chemical composition. The rover's onboard laboratory will study rocks, soils, and the local geologic setting in order to detect chemical building blocks of life (e.g., forms of carbon) on Mars and will assess what the martian environment was like in the past."



Above: The Promised Land, where Curiosity is likely to begin its ascent through hundreds of feet of layered deposits. The lower several hundred feet show evidence of bearing hydrated minerals, based on orbiter observations. The terrain Curiosity will explore is marked by hills, buttes, mesas and canyons on the scale of one-to-three-story buildings, very much like the Four Corners region of the western United States. A scale bar indicates a distance of 1.2 miles (2 kilometers).

Curiosity's 34-millimeter Mast Camera acquired this high-resolution image on Aug. 8, 2012 PDT (Aug. 9 EDT). This image shows the colors modified as if the scene were transported to Earth and illuminated by terrestrial sunlight. This processing, called "white balancing," is useful to scientists for recognizing and distinguishing rocks by color in more familiar lighting. *Image credit: NASA/JPL-*

AGS is seeking sponsors for our monthly dinner meetings. Sponsorship is a great way to get the word out about your organization, help support our student members, and offset the costs of the dinner meetings. For more information, please contact Ann Pattison, VP of Marketing, or any AGS Executive Committee Member.

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GEOSCIENCE CURRENTS

No. 62

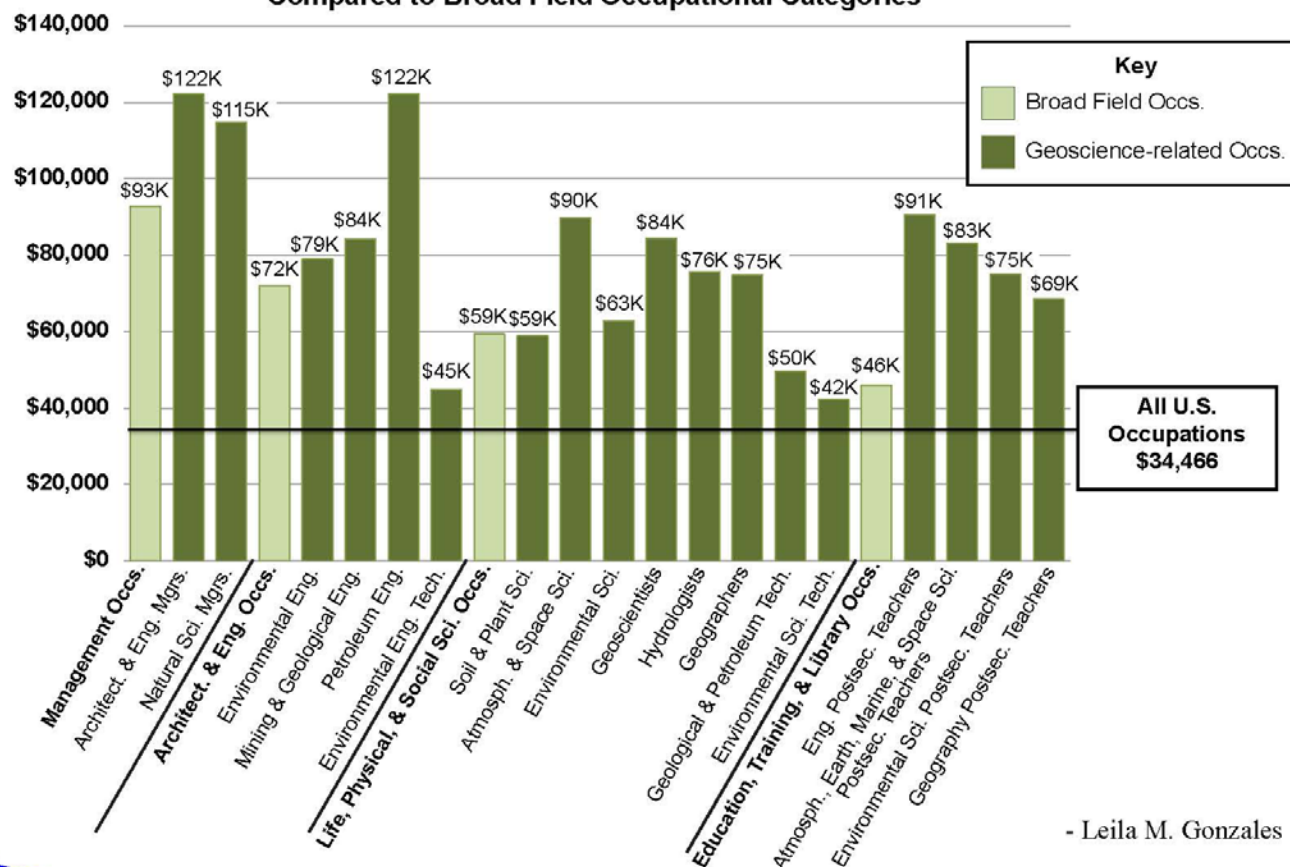
2011 Median* Salaries for Geoscience-related Occupations

Median salaries for non-technician, geoscience-related occupations outpaced broad occupational category salaries in 2011. Salaries for geoscience-related management occupations were 24-32% higher than salaries for all management occupations, while geoscience-related engineering occupations outpaced salaries for all architecture and engineering occupations by 10-70%. Geoscience-related scientific disciplines outpaced salaries for all Life, Physical, and Social Science salaries by 6% (Environmental Scientists) to 51% (Atmospheric and Space Scientists). In addition, geoscience-related postsecondary teacher salaries outpaced Education, Training and Library occupations by 49-97%. Although the majority of median salaries for geoscience-related occupations decreased by less than 3% between 2010-2011, over the past five-years (2007-2011), the majority of median salaries of geoscience-related occupations increased between 1-9%, with Petroleum Engineering salaries seeing the largest growth over the period, and Environmental Engineering salaries seeing the smallest growth.

*The 2011 median salaries for geoscience-related occupations are on average 7% (+/- 4%) lower than the corresponding mean salary. We use median salaries because salary data are often asymmetrically distributed, and thus the median values give better estimates of centrality or a "typical" salary of an occupation.

To view this data interactively, and explore median salary changes for 2010-2011 and 2007-2011, visit:
http://public.tableausoftware.com/views/2011_Geoscience_Salaries/2011GeoscienceSalaries

2011 Median Annual Salaries for Geoscience-related Occupations Compared to Broad Field Occupational Categories



- Leila M. Gonzales

Data derived from U.S. Bureau of Labor Statistics, Occupational Employment Statistics May 2011 data tables.

2013 Slate of Nominees—AGS Officers & Councilors

Don't miss the September 4 meeting, when we will vote on the following slate of officers for 2013. Additional nominations will be accepted from the voting membership from the floor during the September meeting. If you are unable to attend the meeting, you may vote electronically on our website (www.arizonageologicalsoc.org) on or before September 3.

President	Alison H. Jones, Clear Creek Associates
VP Programs	Robert J. Kamilli, U. S. Geological Survey
VP Field Trips	Corolla K Hoag, SRK Consulting
VP Marketing	Ann D. Pattison, Independent
Treasurer	Michael Conway, Arizona Geological Survey
Vice Treasurer	Kim Wilson, Silver Bell Mining
Secretary	Michael Busby, Clear Creek Associates
Vice Secretary	David F. Briggs, Independent
Past President	Jeffrey Cornoyer, Rosemont Copper Company
Councilor 1 (13-15)	Richard Jones, retired
Councilor 1 (13-15)	Coleen Brown, retired
Councilor 2 (12-14)	Kenneth J. Hollett, Retired, U.S. Geological Survey
Councilor 2 (12-14)	Doug Shakel, retired
Councilor 3 (11-13)	Greta Orris, US Geological Survey
Councilor 3 (11-13)	Rachel Feuerbach, student, University of Arizona

2012 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, PO Box 40952, Tucson, AZ 85717

Dues (check box) ☐ 1 year: \$20; ☐ 2 years, \$35; ☐ 3 years: \$50; ☐ full-time student (membership is free)

NEW MEMBER or RENEWAL? (circle one) Date of submittal _____

Name: _____ Position: _____

Company: _____

Mailing Address: _____

Street: _____ City: _____ State: _____ Zip Code: _____

Work Phone: _____ Home Phone: _____

Fax Number: _____ Cellular Phone: _____

E-mail: _____ Check this box if you do not have an email address ☐

All newsletters will be sent by email. If you do not have an email address, we will mail a hard copy to you, but we cannot guarantee timeliness.

If registered geologist/engineer, indicate registration number and State: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright Scholarship Fund.