



GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512
(775) 323-3500 - Hours Tuesday -- Friday, 8 a.m. to 3 p.m. Monday by appointment.
Website: www.gsnv.org • E-mail: gsn@gsnv.org



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CALENDAR OF GSN EVENTS

Feb. 6, 2014
Thursday

SOUTHERN NEVADA CHAPTER MEETING (Every Last Thursday)
The monthly meeting will be held at 5:30 p.m. in room 105 of the Lilly Fong Geosciences building, UNLV. **Speaker: Scott Nowicki. Title: "Planetary Climate Buffers: Why escaping to Mars might not be a good plan for the Human Race"**. Contact Wyatt Bain, bainw1@unlv.nevada.edu. Abstract, page 6.

Feb 10, 2014

GSN 2014 DIRECTORY PICKUP PARTY! 3:00 p.m.—7:00 p.m.
Great Basin Brewing Co., 5525 So. Virginia St., Reno, NV.
SPONSORED BY SRK CONSULTING. See details on page 11.

Feb. 12, 2014
Wednesday

WINNEMUCCA CHAPTER MEETING (Every 2nd Wednesday)
The monthly meeting will be held at the Martin Hotel, Winnemucca, NV. Appetizers/drinks at 6:30 PM, Talk at 7:00 PM. **Speaker: Robert Anderson, Jr.. Title: "Stratigraphy of the Sandman Low Sulfidation Au Deposits, Winnemucca, Nevada". Food & Drinks Sponsored by: AMERICAN ASSAY LABS.** Contact Andy Jansen at Andrew.jansen@newmont.com for more information. Abstract page 7.

Feb. 20, 2014
Thursday

ELKO CHAPTER MEETING (Every Third Thursday)
The monthly meeting will be held at the Western Folk Life Center, 501 Railroad Street. Refreshments at 6:00 PM, **Speaker: Rick Streiff, Newmont Mining Corp. Title: "Discovery History of the WKP Prospect, New Zealand" . Food & Drinks Sponsored by: MAJOR DRILLING.** For more information contact Josh Sovie at jsovie@barrick.com. Abstract on page 8.

Feb. 21, 2014
Friday

GSN MEMBERSHIP MEETING (Every Third Friday)
The monthly meeting will be held at the Reno Elks Lodge, 597 Kumle, Reno. Drinks at 6:00 PM, Dinner at 7:00 PM, Talk at 8:00 PM. **Speaker: Odin Christensen, Geologist. Title: "Gold Nuggets – Evidence of Past Climates and Former Landscapes."** Sponsor for the evening is: **JBR ENVIRONMENTAL.** Dinner reservations must be made by **WEDNESDAY, FEBRUARY 19TH.** Call Laura Ruud at 323-3500; Email: gsn@gsnv.org. DINNER \$25.00. Abstract on page 3.

May 2-4, 2014
(Fri-Sun)

GSN SPRING 2014 FIELD TRIP
Humboldt Range, Majuba Hill, and Trinity Range (Au, Ag, Cu, Sn, W, Be, Hg, Sb, B) See details on page 13.



G.S.N. FEBRUARY MEETING SPONSOR



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FROM THE PRESIDENT, FEBRUARY 2014
Tommy Thompson, G.S.N. President 2013-2014

Last month's presentation by Gary Clifton illustrated the sedimentological controls on localizing placer gold. There were spectacular plate-sized gold discs recovered from parts of the Tertiary Ruby channel deposits. Certainly, one of the questions one asks is "where is the source of the gold??" This month we will hear about possible sources and modifications of placer gold deposits.

Our Spring GSN fieldtrip, scheduled for early May, requires personal 4WD vehicles capable of carrying at least 4 people (driver included). Jon Price has put together a varied trip on both sides of Interstate 80 to sites close to the lovely metropolis of Lovelock!! The mineral collecting should be out-standing.

I've already had requests about an MSHA 8-hour refresher class. It will be organized and held in mid-May (dates to be determined). Bill Collins has always been agreeable to that timing, and it short-circuits the need to go to Carson City or elsewhere for that update.

I want to publically thank Lew Gustafson for an outstanding donation of ~200 hundred specimens of Mt Isa rock and ore samples with corresponding polished thin sections that are being used as part of a lab study in my graduate level economic geology course this semester. This suite of samples was collected by Lew while at Mt Isa over a 2-year span in the 1970's. Its use in my second semester course on Hydrothermal Mineral Deposits is part of a study of SEDEX (sedimentary exhalative) ore deposits. Of course, the real issue is whether or not the Mt Isa deposit is a true SEDEX deposit. Having spent a week there in the late 1980's I came away with my own thoughts and samples about that system. Part of the issue about origin comes from some low-grade metamorphic effects on the soft ore minerals, creating some recrystallization and mobilization of pyrrhotite, galena and sphalerite (see the photo of a polished slab from Mt Isa below). In addition, Lew donated a collection of Economic Geology bulletins spanning an 8-year interval that went to an undergraduate student who is completing his geology degree and is already working in the mining industry. Thanks, Lew!!!



***Thank you to ENVIROTECH DRILLING, LLC
For Hosting the January 17, 2014 Meeting!***

GSN FEBRUARY 21, 2014 Membership Meeting

Reservations Are Required - Please Cancel if You Are Unable to Attend

Please call 775-323-3500, Fax 775-323-3599 or e-mail gsn@gsnv.org by 4 p.m. on WEDNESDAY, February 19, 2014.

Social Hour: 6:00 PM – Dinner: 7:00 PM – Speaker: 8:00 PM

\$25.00 per person. Location: Elks Lodge, 597 Kumle Lane, Reno, Nevada

Directions: across (W) from the Reno-Sparks Convention Center
(S. Virginia Street, behind the Les Schwab Tire Center)

“Gold Nuggets – Evidence of Past Climates and Former Landscapes”

By Odin Christensen

Placer gold deposits, alluvial or residual accumulations of metallic gold, have been worked by man since ancient times and were the principal source of gold for centuries. Gold nuggets in placer concentrations might be considered the scattered skeletons of primary hydrothermal bedrock gold deposits. The enigma is that very few hardrock gold deposits actually contain grains of native gold metal. In most primary hydrothermal deposits, gold is widely disseminated throughout the rock at ppm-level concentrations as an atomic impurity within pyrite or other sulfide minerals. The transformation of gold from impurity in rock to chunks of native metal occurs principally in the weathering environment. Accumulations of placer gold preserve fascinating evidence of past climates and former landscapes.

Normally, we think of gold as being a nearly insoluble element. Under conditions of intense chemical weathering, however, as for example exist today in Brazil, Africa and Australia, the mobility of many elements including gold may be significantly enhanced. Soils have been described as geomembranes – open biogeochemical systems in which there is a dynamic redistribution of elements in response to changing physico-chemical conditions. Where tropical soils have developed over gold-enriched rock, gold is usually concentrated within the mottled soil zone, associated with iron-oxide concentrations, or at the redox boundary at depth. Field evidence suggests that oxidation of primary gold-bearing sulfide minerals releases gold in a chemically active state to the weathering environment. There it is solubilized as a chloride or thiosulfate or humate complex, and moves with groundwater until it is reprecipitated by chemical reduction. As the chemical weathering profile progresses downward, gold continues to be remobilized and increasingly concentrated near the base of the weathering profile.

The morphology of gold grains observed in tropical soils around the world is quite consistent. In the upper oxidizing soil horizon, gold occurs as corroded and pitted remnant grains, evidence of dissolution. Lower in the profile, in the zone of accretion, gold occurs as subhedral to euhedral grains and grain aggregates, often with quite delicate form - clear evidence of grain growth in the supergene soil environment. The fineness of the gold, that is the ratio of gold to silver in the metal, is progressively greater in the secondary crystals. It is quite well established that gold nuggets “grow” in the weathering environment; they are not simply chunks of gold physically weathered from a gold vein.

As tropical soils are stripped by physical weathering, the accumulations of particulate residual gold are released to become alluvium: eroded, transported, and deposited as sediment by rivers, glaciers or even on beaches. In the near-surface environment, gold is indeed both physically and chemically durable. Once formed, placer gold concentrations may be repeatedly redistributed during sequential erosional cycles through geological time.

Interpretation of the origin of placer gold concentrations, then, requires a comprehensive appreciation of changing geological landscapes through time. The great gold accumulations of the Klondike, now an area of relatively low relief and arctic climate, developed tens of millions of years ago when the climate and topography were different than today. A fascinating story, still being worked out, suggests that the source of at least some of the gold in the California goldfields was likely northern Nevada. In this case, sorting out the origin of the auriferous gravels is revealing a fascinating story of the Tertiary climate and tectonics of the Sierra Nevada and Nevadaplano. (See Biography on page 6).

“FACES OF GSN”

Steve Friberg, Consultant

“GEOLOGY IS FUN!”

“A job in Ely sitting on a drill rig? Yeah, OK. Sounds good but could you tell me *where* Ely is and show me on the map where Nevada is please.” Those were my famous words in the corporate headquarters for Cyprus Mines, Los Angeles, June 1965. \$400 per month was big-time income then and I jumped on it.

That was after my infamous two week long trip to Los Angeles at 50mph in a '57 VW bus from Southern Florida where I lived. I had made a decision to find my fortune out west and finish off University. I was in for a total shock.

That was after my three years of college in Tennessee and Florida State beginning in 1960, during which I had decided that I wanted to go into the field of geology. All of this is thanks to reading a number of small science career pamphlets sent to me by the National Science Foundation. One of them showed two hand drawn people in the mountains (Mackinaw shirt, hammer, etc.) whacking away at a rock and I thought “Boy, that sure looked like loads of fun.”.

In my earlier life I had become interested in sciences by learning how to make gunpowder at age 12 (you could buy everything in the pharmacy then). I found that by using chemistry, you could blow the hell out of things. A couple of years later, I became interested in astronomy and I bought a 6” reflecting telescope for \$150 from money I saved by cleaning up stores in S. Florida. In 1957, the telescope was traded in for a used Rolleiflex from the local photographer who took me under his wing and showed me how to develop and print the pictures I took. I enjoyed using the camera so much, the High School wanted me to become the high school photographer. I had been in the High School band before that but trying to play the clarinet while I marched in a parade proved impossible, same problem I have today trying to walk while chewing gum. When you bang your head enough times on the wall you learn, just takes longer sometimes.

Back to Ely. I was there for almost one and a half years representing Cyprus Mines on their famous Butte Valley drilling program testing a large geophysical anomaly. We core drilled with the deepest hole going down to around 4,200'. It doesn't take much time to learn what bug dust is all about; how to drive a 4WD; how to put chains on; how to dig yourself out of the hole you made by putting the chains on; that it was damn cold in Ely; that it snowed there in July; that drillers always try to squirt drill mud on you when you were in their plywood hut; and on and on. You all know the procedures. Our core shack the company had rented was just behind Demont Hansen's Texaco station. The geologists had rented this tin-roofed shack from the Big Four which included their neon sign on the roof (don't tell me you don't know what the Big Four is please). Demont introduced me to jerky. Carlin had just started up a couple of years before. What fun. Highway 50 was REALLY lonely then. My only regret is that I didn't take more pictures.

The project finally fell apart and my bosses convinced me to go to Mackay which I did. Vernon Scheide was the Dean then. Burt Slemmons, E.R. (Dick) Larson, Art Baker, Joe Lintz, Mal Hibbard, Tony Payne just to name a few of the profs were all there. Of course you always used the title Dr. when talking TO them. MSM was a real hoot then. The library was in the dungeon, most of the classes were held in the original building. Life was good. 1968 was the year they handed out degrees and I got one.



Steve & Jerry - Florida in 1947 with my sexy red bathing suit



The ups and downs in Peru

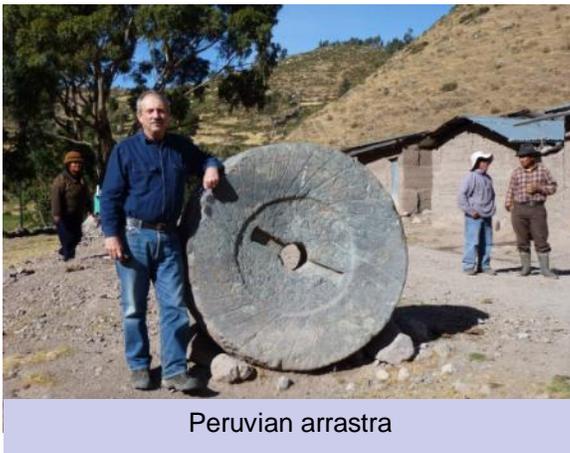
I was planning on going to San Diego State to get my Masters in Marine Geology as there was a lot of talk about mining the sea beds then. That plan got waylaid as my summer job turned out longer than I thought (I really needed the money!) so the next spring, I went back to Mackay and began taking graduate courses. I got hired by Duval Corporation for summer work in 1969 out of the Reno office. By the end of the summer, they wanted me to continue on and, since I was a single father, the income was too tempting. I decided to stay with Duval and put grad school off 'a little'. Those were the good days. You could actually do EXPLORATION. You had very little interference in where and when you could do your work. Roots began to grow here. I liked Nevada. The rocks were great, not too many people living in the state. Plumb Lane was the southern end of Reno. It was a good place to live. Besides, we were in an era when the older geologists really enjoyed mentoring the younger ones and you learned a lot. (cont. on page 5)

(Faces of GSN, Friberg, cont. from page 4)

In the '70's, it was still possible to stay with one company your entire career. Remember company towns?? That all began to change in the later '70's – one oil company president bought into a mining company, a second oil company president thought the first guy knew something he didn't so his company started a mining company and so on until Big Oil owned most of the mining companies. That's when the long term loyalty to the employee began to decline. So what did I do? I left Duval to work for Gulf Mineral Resources. I saw the writing on the wall for that company so off I go Homestake in mid-1979. That's when they had just figured out the Hot Springs model and we were told to find a few of them. By luck, I happened upon the Crofoot-Lewis group of claims (now the Hycroft Gold Mine) in November of that year. I took the first ore-grade samples and convinced Homestake to make a project out of it which they did. The company ended up drilling the heck out of it but then lost interest so in mid-1981 I thought I would give consulting a try. Why not, there weren't too many 'consultants' out there.....yet.



This is NOT what you are thinking



Peruvian arrastra

'not that easy' but it sure was fun! I have to admit the periodic episodes of 'explosive food reaction' weren't much fun but at least it usually went away fast and you would forget and eat the same 'stuff' again. In 2002, I have Clancy to thank for getting me to go to Cajamarca, Peru where I met my future wife, Mimi. We talked for 15 minutes at the hotel resort where she was manager and, thanks to email and telephone, decided to pursue life together. In 1983, I was added to the list of geologists married to Peruanas and have enjoyed this fact ever since. Besides Mimi, I have a wonderful daughter who is a dentist + married to a dentist and, because of them, I have two fantastic granddaughters.

One of my first contracts ended up working for a geologist many of you know - Pete Galli. Pete was responsible for a major change of my "attitude" in the business. One time while travelling in my pickup with Pete, he made the statement "You know, geology is FUN!". In the back of my mind I always knew it was fun but only in a subliminal way. Ever since that Eureka Moment, I conscientiously think of our profession as being FUN. A lot of people work on a job and can't wait to be at the elevator at 5:00 PM on the dot. They don't view their job as being fun but just something they have to do. We are lucky in our profession as we have the ability to really enjoy our work. Searching for that next deposit is a real thrill – it's just over the next hill, or maybe the next one after that, or.....

I've been very fortunate in the experiences I have had since then. I've been able to work in almost every country in the Western Hemisphere. 1987 was the year I 'broke into' Latin America. Shortly after that, I ended up in Bolivia and found out that 18,000' elevation was



Mimi and I studying the Cabo San Lucas geology



My Peruvian buddies

Besides our side of the planet, I've also had the luck to spend several years in China (at times I was not too sure about the luck) and then recently in Tajikistan. Wherever the next destination may be or wherever it is, I'll have a good time. You can turn left, you can turn right but you can't go back so you might as well enjoy it! I just hope all of you will always say to yourselves that GEOLOGY IS FUN!

G.S.N. SOUTHERN NEVADA CHAPTER MEETING

Thursday, FEBRUARY 6, 2014

Time: 5:30 P.M.

Speaker: Scott Nowicki

Room 105 of the Lilly Fong Geosciences building, UNLV.

“Planetary Climate Buffers: Why escaping to Mars might not be a good plan for the Human Race”

Abstract: Planetary climatic buffers are physical, chemical or biological systems that can mitigate the effects of large-scale climate forcings. Ice caps, the oceans, and carbonate deposits are all examples of Earth systems that are currently acting to absorb energy in a warming global environment. There are systems that are being identified as potential significant climate buffers on Earth, including desert biological soil crusts, desert pavements, and other surfaces across the arid landscapes. While these morpho-climatic units seem limited in scale, they may have large implications for a changing globe, and considered over a longer time period, might signal the end of the habitable environments we now enjoy. These systems might even give us insight into a shifting climate on Mars, which is revealing more evidence for a dynamic recent past. A popular theme for promoting planetary exploration is that when the human race devastates Earth, we can turn to a terraformed Mars as a refuge for our species. The timing of changes to planetary buffers on Earth and Mars and their implications for human expansion is worth considering, even with the limited amount of information available.

Biography: Scott Nowicki is an Assistant Professor in Residence in Geoscience and teaches courses in planetary exploration, remote sensing and GIS. In the past, he has worked on four active missions to Mars, using remote sensing to understand the global surface layer. Currently, his research involves mapping climatically-significant surfaces on the Earth, working with researchers in other fields to apply cutting-edge remote sensing techniques to habitat, ecosystem and hydrologic mapping.



(from page 3)

Odin D. Christensen Biography:

Long-time GSN member Odin Christensen is an exploration geologist with some 40 years of diverse worldwide experience in mineral exploration, deposit development and mining. Christensen received a BA in Geology from the University of Minnesota, Duluth, and a PhD in Geology from Stanford University. Early career experience included three years as Assistant Professor at the University of North Dakota and three years as Research Geochemist with the Earth Science Laboratory, University of Utah Research Institute.

In 1981, Odie joined Newmont Exploration as an exploration geologist in Reno. In 1985, he became Exploration Manager for Newmont Exploration and Carlin Gold Mining Company in northeastern Nevada, which included directing exploration and mine geology programs in the Carlin district during a period of unprecedented deposit discovery and mine development.

Odie took his Nevada experience worldwide as Chief Geologist for Newmont Mining Corporation beginning in 1991. In this role, he participated on the ground with early exploration and deposit definition of the world-class Yanacocha gold district in Peru, the Mesel gold deposit on Sulawesi Island, Indonesia, and the Batu Hijau porphyry copper-gold deposit on Sumbawa Island, Indonesia.

In 2001, Christensen moved to Bolivia as Exploration Manager for Empresa Minera Inti Raymi, managing mine geology at the Kori Kollo gold mine and directing exploration in Bolivia. He was directly involved with the discovery through pre-feasibility of the Kori Chaca gold deposit, Bolivia. He returned to the USA in 2003 as President of Hardrock Mineral Exploration, a mineral exploration consulting company based in Mancos, Colorado. Odie has worked as a geologist in 28 countries in Asia, Africa, Europe, North America and South America.

G.S.N. WINNEMUCCA CHAPTER MEETING

WEDNESDAY, FEBRUARY 12, 2014

Location: The Martin Hotel, Winnemucca, Nevada

6:00 p.m. - Appetizers/Drinks

7:00 p.m.—Talk begins

Food and Drinks Sponsored by: AMERICAN ASSAY LABORATORIES



SPEAKER: Robert M. Anderson Jr.

TITLE: “Stratigraphy of the Sandman Low Sulfidation Au Deposits, Winnemucca, Nevada”

Newmont Mining Corporation’s Sandman Au project consists of five recognized, mid-Miocene low-sulfidation epithermal deposits hosted primarily in mid-Tertiary volcanic, volcanoclastic, and fluvial rocks, and to a lesser degree within basement Triassic rocks and late Mesozoic intrusions. These deposits include North Hill, Silica Ridge, Southeast Pediment, Abel Knoll and Ten Mile. Hosted entirely within mid-Tertiary volcanic, epiclastic, and fluvial rocks, the deposits of North Hill, Silica Ridge, and Southeast Pediment are both structurally and stratigraphically controlled. Abel Knoll is hosted within a mid-Tertiary polyolithic breccia body composed of trachy-andesite to andesite, basement phyllites and trace granodiorite, and tuffaceous wall rocks. In the southeast of the project area, the Ten Mile deposit is structurally controlled and hosted dominantly within a late Mesozoic granodiorite stock.

Excluding the Ten Mile deposit, which is controlled by northeast-striking faults, deposits occur along north to north-northwest extensional structures. Intersections with northeast structures and the presence of Early Miocene mafic dikes also played a role as fluid conduits. Post-mineral structural offset affects all deposits. Older fault reactivation and movement along younger Basin and Range structures resulted in the development of north-south-striking grabens and half grabens and lesser intervening northeast grabens.

Basement lithologies consist of Triassic metasedimentary rocks dominated by phyllitic mudstones and siltstones with lesser degrees of quartzites and rare limestone units interbedded. Regional foliations strike northeast and dip moderately to the northwest. Basement rocks have been intruded by late Mesozoic granitic stocks to the east and southeast of the project in addition to local diking in phyllites on the flanks of Blue Mountain to the west. Lying unconformably on basement rocks is an approximately 700->1300 foot thick package of Tertiary volcanic, epiclastic, and fluvial rocks. Lithologies consist of northeast striking, gently southeast dipping dacitic to rhyolitic airfall tuffs, pyroclastics and distally sourced ash flow tuffs with interbedded fluvial and lacustrine volcanoclastic siltstones, sandstones, and conglomerates. The presence of thick, distally sourced fluvial rocks in the northern portions of the property represent a major east-west (?) Oligocene to early Miocene paleodrainage. These rocks may be related to the inferred Cretaceous age Pansy Lee Conglomerate to the east, although this remains to be definitively proved. Additionally, further to the south drill intercepts have encountered approximately two hundred feet of organic and sulfur-rich, varved and laminated lacustrine sediments. Early Miocene basaltic trachy-andesite, trachy-andesite, and andesite sills and dikes intrude and cap the Sandman stratigraphic section.

Subtle topography limits outcrop exposures of mid-Tertiary rocks to capping mafic flows within the Basalt and Little Basalt Hills and more resistant quartz-adularia altered ridges occurring in the northwest of the Sandman project area. Additionally, extensive Quaternary deposits of the Crescent Dune Field cover much of the northern part of the property. Three field seasons were spent mapping surface exposures and trenches and logging drill core and reverse circulation chips from the project area leading to the recognition of three distinct tuff units within the (cont. page 10)

**WINNEMUCCA CHAPTER
JANUARY SPONSOR**



**Thanks to
MAJOR DRILLING
for sponsoring the
Winnemucca Chapter
meeting in January**

**ELKO CHAPTER
JANUARY SPONSOR**



**Thanks to
TIMBERLINE DRILLING INC.
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Elko Chapter meeting in January**

G.S.N. ELKO CHAPTER MEETING

THURSDAY, FEBRUARY 20, 2014

Refreshments and appetizers @ 6:00 p.m, Talk @ 7:00 p.m.

Western Folklife Center

501 Railroad Street, Elko, Nevada

Sponsor for the evening is: MAJOR DRILLING

MAJOR

Drilling America, Inc.

SPEAKER: RICK STREIFF, NEWMONT MINING CORP.

TITLE: Discovery History of the WKP Prospect, New Zealand

Abstract

WKP is a historic mining prospect within the Hauraki Goldfield, a classic epithermal mining district located on the North Island of New Zealand. Over 50 producing epithermal veins are located on the Coromandel Peninsula, hosted mainly in Miocene to Pliocene andesites or dacites overlying a Jurassic aged metasedimentary sequence. Significant veining also occurs in the overlying rhyolites. The district has produced 12 million ounces of gold and 62 million ounces of silver since its discovery in 1862.

Unsuccessful historic mining at WKP was mainly from 1893-1897 at the Royal Standard mine. Modern exploration along the main stream gorge WKP was undertaken by Amoco, BP and others from 1978-1993 and included 5500 meters of drilling. Newmont acquired a controlling interest in the property in 2005 and started some preliminary work on the prospect in 2007-2008. Reconnaissance geologic mapping and field checking of previous mapping in early 2009 highlighted the need to remap the geology of the entire prospect area. Interest quickly moved from the previously explored outcropping stream gorge area to finding other unexplored epithermal mineralization as additional areas of alteration and veining were mapped. Large areas of ground around the prospect, previously interpreted to be overlain by thick post-mineral andesite, were found to be mantled by a thin layer of landslide debris, greatly increasing the size of the prospective area. A 2 meter wide, multiphase quartz vein was located during outcrop mapping in a stream bed that assayed up to 5.2 g/t Au in outcrop. This vein looked significantly different than previously mapped veins in the area and had a north-east strike more typical of productive veins in the district.

Newmont increased the exploration activity at WKP based on the results of this initial work. A helicopter pad was cut out of the forest at the site and geology crews were flown in, saving 4 hours of commute time each day. Outcrop mapping with rock chip sampling was completed across the area, followed by detailed 1:200 mapping in the Teawaotemutu stream bed, a soil sampling program and 5.3 line-kilometre CSAMT program. Results from all of these programs indicated a new epithermal system about 500-800 meters west of the historically prospected area at WKP.

A second helipad and two drill sites were cleared in the forest in early 2010, followed by mobilization of a heli-supported core drill and driller's camp. WKP-24 was drilled across the target zone, intersecting the main vein and 156m at 1.6 g/t Au in the footwall of that vein. Higher grade intervals, up to 1.6m at 30.1 g/t Au, were also intersected, as well as a 6.9m true width zone on a dike margin averaging 6.8 g/t Au. Two follow-up holes with similar grades from the same site confirmed strike and dip continuity of this zone. Additional CSAMT was completed in 2010 as well. Wide-spaced follow-up drilling in 2011 extended the strike of this Central zone to over 800m containing similar grades. The drill was turned 180 degrees at the southern-most site to test an additional CSAMT resistor hidden under landslide debris. This hole, WKP-30, intersected two veins averaging 3.2m at 37.0 g/t Au and 13.2m at 4.8 g/t Au in what is now known as the Western zone. A third CSAMT program was completed in late 2011 to expand knowledge to the south towards the Golden Cross mine. A deep drill test below the original WKP-24 discovery hole in early 2012 intersected 7.5 meters true width of 17.2 g/t Au in the original quartz vein. Grade appears to be contained within breccia clasts transported upward within the vein. A third new target, a CSAMT resistor coincident with a major graben bounding fault, was tested in mid-2012, intersecting intense silicification associated with multiphase banded quartz veins assaying 7.9m @ 5.1g/t Au including 3.4m @ 8.3g/t Au. A large follow-up drill program is in progress at WKP.

GSN Spring 2014 Field Trip

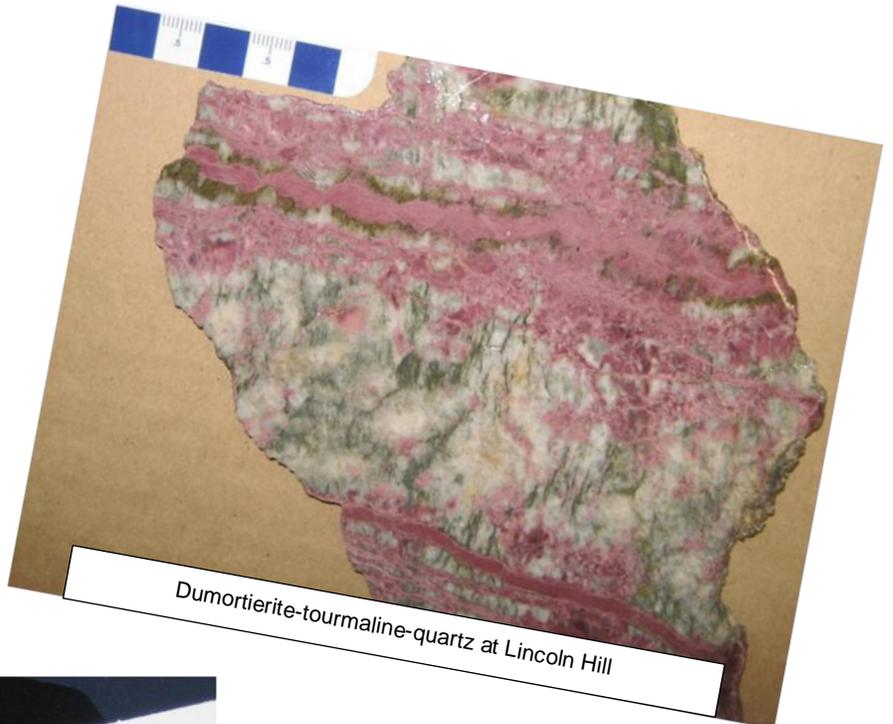
“Humboldt Range, Majuba Hill, and Trinity Range (Au, Ag, Cu, Sn, W, Be, Hg, Sb, B)”

Mark your calendar: Friday, May 2, to Sunday, May 4, 2014

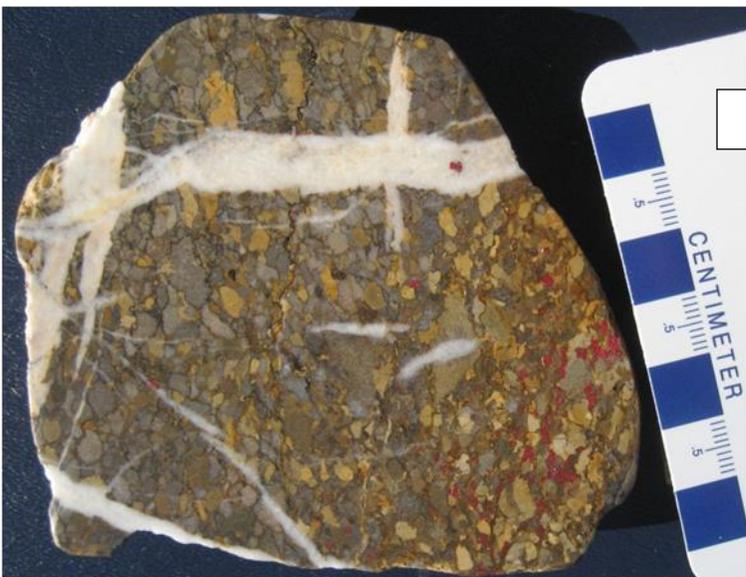
GSN Vice President, Jon Price, has been working diligently on the upcoming Spring 2014 Field Trip to be held May 2-4, 2014. He has put together a varied trip on both sides of Interstate 80 to sites close to the lovely metropolis of Lovelock!! The mineral collecting should be outstanding. The trip requires personal 4WD vehicles capable of carrying at least 4 people (driver included). Laura Ruud, GSN Office Manager, is taking reservations for the trip. The itinerary and registration cost will be emailed out by the end of February and an official Sign Up sheet will appear in the March 2014 GSN newsletter. Don't miss out on this trip that will be filled with geology, camaraderie and fun. Reserve your spot today by emailing: gsn@gsnv.org or calling the GSN office at 775-323-3500!



Questions on the outcrop



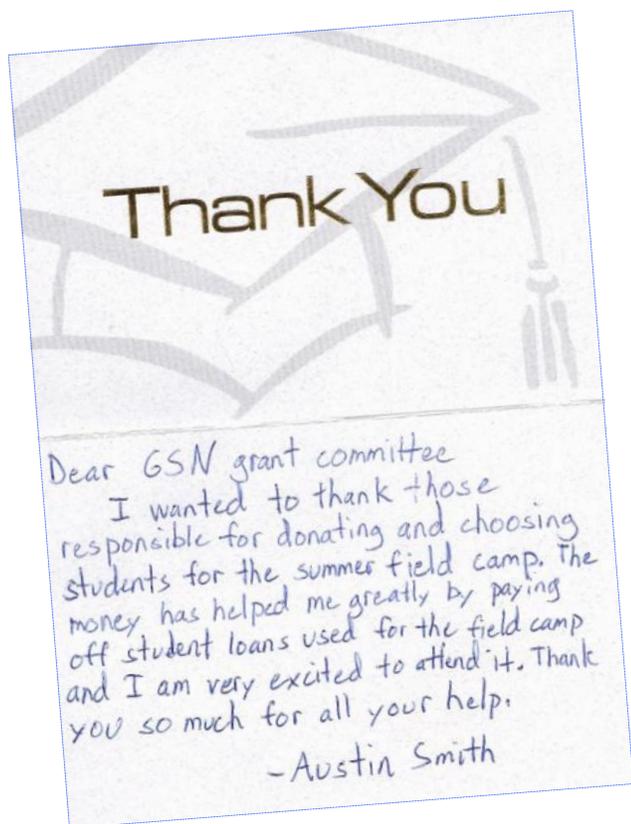
Dumortierite-tourmaline-quartz at Lincoln Hill



Cinnabar and the headframe at Nevada Quicksilver



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(Anderson Abstract cont. from page 7)

Sandman stratigraphic section. Petrography, trace element geochemistry, and radiometric age dating was used to create a detailed stratigraphic column linking variable stratigraphy from deposit to deposit.

Within the northwest of the property, mapping and drilling has indicated a paleodrainage-controlled, marker fiamme unit—dated at ~25.4 Ma—linking the stratigraphic section across Silica Ridge, Adularia Hill, and North Hill. Outcrop appearance with abundant large fiamme, a sparse phenocryst assemblage of sanidine-plagioclase-anorthoclase-beta quartz-biotite, radiometric age dating, and trace element geochemistry confirm this marker fiamme unit to be the regionally widespread rhyolitic Nine Hill Tuff. Named for the type locality in the Sierra Nevada foothills just north of Carson City, this pyroclastic unit is widespread and has been correlated with the “D” unit of the Bates Mountain Tuff in central Nevada near Austin. The Sandman project area is the furthest north documented location of the Nine Hill Tuff. No source caldera has yet been identified, though through regional distribution it has been suggested to lie beneath sediments within the Carson Sink.

Lower in section, a distinctive rhyolite tuff with coarse-grained sanidine-anorthoclase crystal fragments and abundant pumice ± fiamme has been dated at ~26.0 Ma. With a similar age, the Ashdown tuff—exposed to the west of the Sandman project in the Pine Forest and Black Ranges—is petrographically similar with abundant coarse-grained sanidine and pumice fragments; however, the two have differing trace element geochemistry, with the Ashdown Tuff being significantly enriched in Zr and Nb compared to the unnamed tuff found in outcrop at Adularia Hill and encountered in drill core at Silica Ridge and Southeast Pediment.

A dacitic to rhyolitic tuff of older—but unconfirmed age—has been encountered in drill core at Abel Knoll, Southeast Pediment, and Silica Ridge. Recognized by a distinctive, moderately welded, basal polyolithic volcanic breccia, the Red-Green Breccia tuff package is composed of repetitive lapilli-lithic, fiamme, and vitric airfall tuffs. Excluding rare plagioclase and biotite within the basal polyolithic breccia, crystal fragments are largely absent. A lack of datable phenocrysts combined with extensive propylitic, argillic, and quartz-adularia overprints has hindered dating of this tuff unit.

The youngest rocks exposed within the Sandman project area include capping mafic flows and related sills and dikes of basaltic trachyandesite, trachyandesite, and lesser andesite. These rocks have been dated at ~22.5 Ma. Rocks of a similar age and composition have been documented to the northeast of the Sandman project area within the Bloody Run Hills and the Santa Rosa Range. Similar rocks are also exposed to the east in the hills between Winnemucca Mountain and the Bloody Run Hills, and to the north in isolated exposures along the east flank of the Slumbering Hills. With abundant clasts of andesite, the Abel Knoll breccia body is also likely of a similar age. The spatial association of early Miocene dikes, sills, and mafic breccia bodies to middle Miocene low sulfidation Au mineralization may provide a useful tool for future exploration within and outside the project area.

The G.S.N. is having a 2014 Membership Directory

“PICK UP PARTY”

HOSTED BY SRK Consulting (U.S.), Inc. in RENO!



WHEN: MONDAY, FEBRUARY 10, 2014

TIME: from 3 p.m. to 7 p.m. (Happy hour is 3-6 p.m.)

WHERE: GREAT BASIN BREWING COMPANY, RENO LOCATION!

5525 So. Virginia Street, Reno, Nevada



WHAT: Be the first to receive your 2014 GSN Membership Directory!

Help save GSN some postage, have a beer on SRK and enjoy camaraderie with your fellow GSN Members!

The 2014 Directories will also be available for pick-up after February 10th at:

- ⇒ Mine Development Associates, 210 So. Rock Blvd., Reno from Feb. 11—21, 2014
- ⇒ the Winnemucca Chapter Meeting on Feb. 12, 2014
- ⇒ the Elko Chapter Meeting on Feb. 20, 2014
- ⇒ the Membership Meeting in Reno on Feb. 21, 2014
- ⇒ The GSN Office, 2175 Raggio Pkwy., until FEB. 21, 2014



**MINE DEVELOPMENT
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For those who can't pick them up, I will get them shipped by the end of February!

ROCK TALK

(Reprinted from Reuters online, January 21, 2014)

'Exceptional' 29.6 Carat Blue Diamond Found in South African Mine

LONDON Tue Jan 21, 2014 7:06am EST



The exceptional 29.6 carat blue diamond recovered earlier this month is seen in this undated photograph received via Petra Diamonds in London January 21, 2014. (CREDIT: REUTERS/PETRA DIAMONDS LIMITED/HANDOUT)

(Reuters) - A 29.6 carat blue diamond, one of the rarest and most coveted in the world with a possible price tag of tens of millions of dollars, has been discovered at a South African mine by Petra Diamonds.

The miner said the "exceptional" acorn-sized diamond, small enough to fit into the palm of a hand, was unearthed at the Cullinan mine near Pretoria.

The mine, owned by the firm since 2008, was also where the Cullinan Diamond was found in 1905 - described as the largest rough gem diamond ever recovered and weighing 3,106 carats.

Other notable diamonds found in the mine include a 25.5 carat Cullinan blue diamond, found in 2013 and sold for \$16.9 million, and a diamond found in 2008, known as the Star of Josephine, which was sold for \$9.49 million.

Chief Executive Johan Dippenaar told Reuters the latest blue diamond discovery could outstrip recent finds.

"By some margin ... this is probably the most significant stone we've ever, in terms of blue stones, recovered," he said.

"The stones in the last year or so are selling well above \$2 million per carat. That's not my quote, that's updates in the market," he said ahead of the company's first-half trading statement.

Petra Diamonds is due to release figures on production and sales for the six months to December 31 on Thursday, but these will not take into account the find which occurred in January.

Analyst Cailey Barker at brokers Numis thought the diamond could fetch between \$15 million and \$20 million at auction.

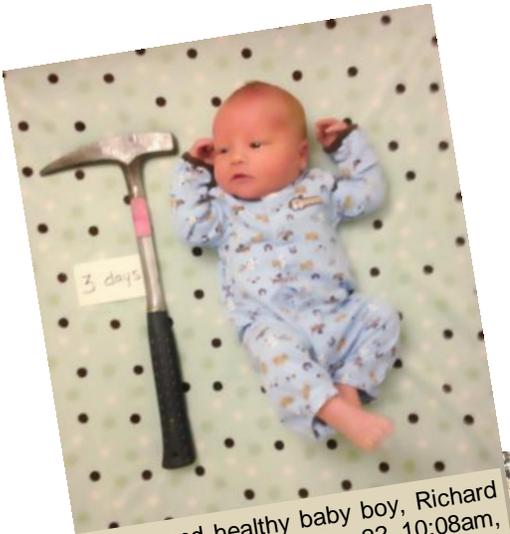
Diamonds from both the Cullinan mine in South Africa and the Williamson facilities in Tanzania, both owned by Petra, have been displayed at London's Buckingham Palace and are regarded as among the rarest and most valuable in the world.

The 1905 Cullinan Diamond has been cut into two stones - the First Star of Africa and the Second Star of Africa - and form part of Britain's Crown Jewels held in the Tower of London.

Dippenaar said the company would decide what to do with the diamond in the next week.

(Reporting by Costas Pitas; Editing by Kate Holton and Mark Potter)

GSN BABY ANNOUNCEMENTS!



Happy and healthy baby boy, Richard "Richie" Nathan Ellis Dec 22, 10:08am, 8lb 6oz, 21" to proud parents Laura and Josh Ellis and big sister Eva.



Healthy baby boy, Jack Donald Peters, Dec 18, 2013 at 4:59 pm, 4lb 13.5 oz, 18.5" to proud but sleep deprived parents Chad and Carla Peters



Michele Lefebvre and her husband Ben Barna welcomed daughter Charlotte Elizabeth Barna who was born on April 10, 2013 weighing in at 6 lbs 11 ounces and 20.75 inches. She is their little peach!

Upcoming Events

3 February, DREGS meeting, Speaker: Rex Bryan, Title: "The invention of the Qualified Person ("QP") and How it Employs Geologists; This and Other Perspectives of a "Bank able Reserve Man" ("Geostatistician)". Colorado School of Mines, Golden, CO, Berthoud Hall Room 241. Social at 6 pm, Presentation at 7 pm. Please Visit the DREGS web site at <http://www.dregs.org> for more information.

4 February, Arizona Geological Society, Speaker: Ralph Stegen, U.S. Geological Survey; Title: "The Morenci Porphyry Cu-Mo Deposit, Greenlee County, Arizona: A Geologic Summary with Emphasis on Hypogene and Supergene Mineralization". Sheraton Hotel, Oasis Room, 5151 E. Grant Rd., Tucson, AZ. Drinks @ 6 pm, Dinner @ 7 pm, Talk @ 8 pm. Reservations required by Feb. 1, 2013. For more information please go to: <http://www.arizonageologicalsoc.org/>

6 February, Nevada Petroleum & Geothermal Society, Reno, Nevada. Speakers: Lowell Price, NDOM, Carson City NV and John Menghini, BLM, Reno NV. Topic: NDOM/BLM Updates, Oil, Gas and Geothermal Activity in Nevada 6:30 PM, Ramada Reno Hotel; 1000 East 6th Street, Reno, NV. Contact Vicki Ehni for dinner reservations: vehni@aol.com

12 February, Nevada Petroleum & Geothermal Society is sponsoring the movie "**SWITCH**" a 98-minute film that provides a well-balanced, informative perspective on energy and shows alternatives to how we can transition from the energy that built our world to the energy that will shape our future. to be shown at **UNR's Joe Crowley Student Union Theater at 7:00 PM**, Go to this link to reserve your FREE ticket: <http://www.eventbrite.com/e/nevada-petroleum-and-geothermal-society-inc-screening-tickets-6466211613>

13-16 February, 60th Annual Tucson Gem and Mineral Show, "60 Years of Diamonds, Gems, Silver and Gold"
Tucson Convention Center, 260 South Church Avenue, Tucson AZ. For more info go to: <http://www.tgms.org/2014showinfo.htm>

23-26 February, 143rd SME Annual Meeting and Exhibit—"Leadership in Uncertain Times", Salt Palace Convention Center, 100 SW Temple, Salt Lake City, Utah. Please go to their website for more information: www.smenet.org/meetings.

3-6 March, PDAC, Prospectors and Developers of Canada Convention, Toronto, Ontario, CANADA. Stop by the **GSN Booth #1611** and visit Laura Ruud while you are there (Tradeshaw side)! Please go to their website for more information: <http://www.pdac.ca/convention>

Activity Update

Mike Brady, December 2013

www.activityupdate.com

NEVADA

Regulus Resources Inc. announced that it acquired an option to earn a 50% interest in the Golden Brew Property from Highway 50 Gold Corp. for \$5,000,000 in exploration expenditures over 5 years. *Press Release:* December 20

Ashburton Ventures Inc. announced that it terminated its interest in the Golden Eagle Property. *Press Release:* December 20

Tertiary Minerals plc. announced that recent drill results at the MB Project include 39.62-123.44 meters @ 8.1% CaF₂ (13TMBRC08); 42.67-111.25 meters @ 9.9% CaF₂ (13TMBRC09); 16.76-44.2 meters @ 10.5% CaF₂ (13TMBRC11) and 39.62-76.2 meters @ 8.4% CaF₂ (13TMBRC12). *Press Release:* December 18

Teck Resources Ltd. announced that it acquired an option to earn a 55% interest in the North Star Property from Altan Nevada Mines Ltd. for \$2,500,000 in exploration expenditures over 4 years. *Press Release:* December 15

Goldcorp Inc.(66.7%) announced that reserves at the Marigold Mine aggregate 196,430,000 tonnes @ 0.52 gpt Au proven+probable. (was 135,720,000 tonnes @ 0.53 gpt Au proven+probable) *2012 Annual Report*

Goldcorp Inc.(66.7%) and Barrick Gold Corp.(33.3%) announced that they retained the Bank of Montreal to sell their interests in the Marigold Mine. (reserve = 196,430,000 tonnes @ 0.52 gpt Au proven+probable) *M.J.:* November 22

Kinross Gold Corp. announced that it closed its Reno exploration office. *N.M.:* December 9

Klondex Mines Ltd. announced that it acquired an option to purchase a 100% interest in the Midas Property from Newmont Mining Corp. for \$55,000,000 cash, 5,000,000 shares and the cash replacement of a \$28,000,000 reclamation bond. (reserve = 545,000 tonnes @ 3.24 gpt Au, 266 gpt Ag proven+probable) *Press Release:* December 4

Asher Resources Corp. announced that recent drill results at the King Project include 7.6 meters @ 3.72 gpt Au (KM-3) and 9.1 meters @ 3.26 gpt Au (KM-4). *Press Release:* December 23

Quaterra Resources Inc. announced that it acquired an option to purchase various land parcels that overlie a portion of the Bear Deposit from private interests for undisclosed terms.

(resource @ Bear = 500,000,000 tonnes @ 0.40% Cu inferred)
Press Release: December 4

Elephant Copper Ltd. announced that it would acquire International Millennium Mining Corp. for \$0.30/share. (resource @ Nivloc = 2,176,000 tonnes @ 0.67 gpt Au, 87.2 gpt Ag inferred) *Press Release:* December 23

Veris Gold Corp. announced that recent underground drill results at the SSX-Steer Project include 154.02-165.27 meters @ 4.05 gpt Au (SSX-SR248); 85.4-91.5 meters @ 3.12 gpt Au (SSX-SR249) and 211.97-263.82 meters @ 7.68 gpt Au (SSX-SR251). (resource = 3,647,000 tonnes @ 7.64 gpt Au measured+indicated) *Press Release:* December 4

Silver Predator Corp. announced that it would acquire the Springer Tungsten mine and mill as well as various other Nevada property assets from Americas Bullion Royalty Corp. for \$500,000 in shares and a promissory note of \$4,500,000 payable over 3 years. (resource = 322,700 tonnes @ 0.54% WO₃ indicated) *Press Release:* December 17

Scorpio Gold Corp.(70%) announced that recent drill results at the Mineral Ridge/Bluelite Project include 18.29-22.86 meters @ 0.37 gpt Au (MR13726); 50.29-51.82 meters @ 0.65 gpt Au (MR13731); 32.0-36.58 meters @ 2.16 gpt Au (MR13734) and 22.86-24.38 meters @ 0.69 gpt Au (MR13735). (resource @ Mineral Ridge = 4,230,000 tonnes @ 1.47 gpt Au indicated) *Press Release:* December 16

Klondex Mines Ltd. announced that recent drill results at the Fire Creek Project include 126.5-131.1 meters @ 8.49 gpt Au (FC13-255); 161.5-164.6 meters @ 6.16 gpt Au (FC13-265) and 342.9-365.8 meters @ 8.36 gpt Au (FC13-275). (resource = 206,400 tonnes @ 44.7 gpt Au measured+indicated) *Press Release:* December 19

Corvus Gold Inc. announced that recent drill results at the North Bullfrog/Yellowjacket Project include 130.5-135.3 meters @ 16.86 gpt Au, 74.5 gpt Ag (NB13-354); 80.8-108.7 meters @ 3.59 gpt Au, 21.6 gpt Ag (NB13-355); 123.8-153.2 meters @ 6.91 gpt Au, 23.1 gpt Ag (NB13-356) and 32.1-56.4 meters @ 1.30 gpt Au, 14.4 gpt Ag (NB13-358). (resource @ North Bullfrog = 15,230,000 tonnes @ 0.37 gpt Au, 44 gpt Ag indicated) *Press Release:* December 5

Canamex Resources Corp. announced that recent drill results at the Bruner/Penelas East Project include 174.72-232.96 meters @ 0.99 gpt Au (B-1330C); 256.62-291.2 meters @ 0.93 gpt Au (B-1333C) and 93.0-178.36 meters @ 1.51 gpt Au (B-1341C). *Press Release:* December 5

NEVADA BUREAU OF MINES & GEOLOGY JOB ANNOUNCEMENT

ASSISTANT PROFESSOR
Economic Geology

The Nevada Bureau of Mines and Geology (NBMG) at the University of Nevada, Reno seeks applicants for a tenure-track faculty position focused on hydrothermal mineral deposits. NBMG is a research and public service unit of the University of Nevada, Reno (UNR) and the state geological survey. Managed as part of the Mackay School of Earth Sciences and Engineering in the College of Science at UNR, NBMG functions as an academic unit, and its principal scientists are tenure-track faculty members. Nevada is one of the most exciting regions in the world to do research in the geosciences and the best in the U.S. for the study of hydrothermal mineral deposits.

Interested applicants must have a doctorate in geology or a related geoscience field by the time of hire and a demonstrated record of research on topics related to hydrothermal mineral deposits as indicated by dissertation research or peer-reviewed publications. Excellent communication skills, as demonstrated in written application materials; commitment to public service; potential for, or established record of publications; and ability to attract funding are essential. Doctoral research must include one or more of the following disciplines: economic geology, structural geology, igneous petrology, and geochemistry.

Additional preferred qualifications include: 1) industrial or academic experience in hydrothermal minerals deposits, particularly in field-based studies in a variety of geological settings; 2) expertise in structural geology, geologic mapping, and active hydrothermal systems (geothermal activity); 3) research productivity with publications in the peer-reviewed literature; 4) achievable plans for funded research on Nevada-focused topics in economic geology and geothermal energy, as described in the applicant's letter of interest; and 5) both an understanding of and interest in contributing to the role of a state geological survey on issues related to mineral deposits and other resources, beyond basic scientific research.

Position responsibilities and expectations include: 1) working independently as well as collaborating with NBMG faculty-staff, faculty in other geoscience units at UNR and UNLV, and others in industry and government in developing funded projects and conducting research; 2) contributing to the development of datasets and reports on Nevada's mineral and energy resources, including resource assessments; 3) communicating effectively with the public and community leaders regarding the geology of Nevada and its mineral and energy resources; 4) focusing research on mineral deposits in Nevada; and 5) supervising graduate students and teaching undergraduate and graduate classes.

The position will be a tenure-track faculty appointment with an academic-year base salary that is competitive with other research universities. Starting date will be July 1, 2014 or shortly thereafter, depending on availability of the successful candidate.

To apply, please visit: <https://www.unrsearch.com/postings/13967>. Please complete the online application and upload a letter expressing your interest in the position and research plans; a complete vita; contact information (names, e-mail and postal addresses, and telephone numbers) for at least three references; and electronic copies of up to three of your publications. Additionally, applicants must submit examples of geologic mapping related to mineral deposits that they have conducted with their application materials. To ensure full consideration, all information must be submitted by **March 24, 2014**. For further information about NBMG, please consult our website (<http://www.nbm.unr.edu>).

Equal Employment Opportunity/Affirmative Action. Women and underrepresented groups are encouraged to apply.

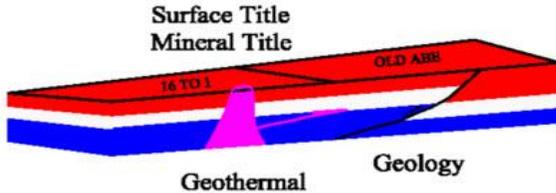
If you have any questions, please contact John Muntean, who is serving as the Chair of the Search Committee (munteanj@unr.edu).

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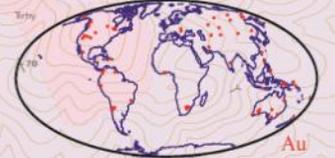
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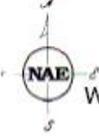
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