



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. 3, 2016
WEDNESDAY



G.S.N. 2016 DIRECTORY PICK-UP PARTY

The new **GSN 2016 Membership Directories** will be available to pickup on WEDNESDAY, February 3, 2016 at the **Great Basin Brewing Company, RENO LOCATION, 5525 S. Virginia St., Reno.** Time will be from 4 p.m.—7 pm. Save GSN postage by picking your directory up and have a drink on our sponsor for the evening, **SRK CONSULTING!**

Feb. 4, 2016
THURSDAY

SO. NEVADA CHAPTER MEETING (1st Thursday of the month)

The meeting will be held at the Las Vegas Natural History Museum, 900 Las Vegas Blvd North. **Speaker: Nick Taranik, Hydro Resources—West, Inc.** Title: "Applications of the Flood Reverse Drilling Method for Mining and Water Wells". **Food & Drinks Sponsored by: GEOTEMPS INC.** Please contact Josh Bonde for more information: Joshua.bonde@unlv.edu. See page 6.

Feb. 10, 2016
WEDNESDAY

WINNEMUCCA CHAPTER MEETING (2nd Wednesday of the month)

The meeting will be held at the Martin Hotel, 94 W. Railroad St., Winnemucca, NV. Drinks at 6 p.m. Appetizers at 6:30 p.m. and talk at 7:00 pm. **Speaker: Bill Howald, Rye Patch Gold. US Inc.** Title: "Geology and Mineralization of the Lincoln Hill Gold and Silver Deposit". **Food & Drinks Sponsored by: AMERICAN ASSAY LABORATORIES.** For more info please contact James Carver @ jcarver@silverstandard.com. Details and abstract on page 7.

Feb. 18, 2016
THURSDAY

ELKO CHAPTER MEETING (3rd Thursday of the month)

The meeting will be held at the Western Folklife Center, 501 Railroad St., Elko, NV. Refreshments begin at 6 pm. Talk at 7:00 pm. **Speaker: Andy Baldus, Barrick Cortez Underground.** Title: "Application of XRF for Routing Ore". **Food & Drinks Sponsored by: OLYMPUS.** For more info please contact Mark Travis at: mark.william.travis@gmail.com. Details on page 6.

Feb. 19, 2016
FRIDAY

GSN MEMBERSHIP MEETING (3rd Friday of the month)

The GSN meeting will be held at the Reno Elks Lodge, 597 Kumle Lane, Reno, Nevada. Social hour begins at 6 pm, Dinner is at 7 pm and talk begins at 7:45 pm. **Speaker: Dr. Mae Gustin, Professor, NRES Dept., UNR.** Title: "Mercury emissions from nonpoint sources at Nevada Gold Mines-Do they matter and how to reduce them". **Drinks Sponsored by: HYDRO RESOURCES—WEST, INC.** Cost for Dinner—\$25. Please make reservations for dinner with Laura Ruud at the GSN office: gsn@gsnv.org or 775-323-3500. Details and abstract on page 3.



G.S.N. FEBRUARY MEETING SPONSOR



HYDRO RESOURCES—WEST, INC.

FROM THE PRESIDENT
Elizabeth Zbinden, G.S.N. President 2015-2016
FEBRUARY 2016

Though I would not have anticipated this at the beginning of my term, a common theme running through my columns for the year has been political activism. This column continues the theme.

You cannot have escaped hearing about the looming First-in-the-West Presidential caucuses coming up here in Nevada. This month's assignment to all in-state GSN members is to participate in the caucus and help get the candidate of your choice nominated. Or, if you are of the "they are all useless" school of thought, help keep the worst of 'em *out* of the nomination.

This sort of caucus (as opposed to an affinity group in a legislature) is often defined as "gathering of neighbors". Rather than go to the polls to vote, registered voters gather by precinct in a meeting run by the party instead of by the state board of elections. There will still be a regular primary election in June, but it will be to determine the nominees for other races such as Senate, House of Representatives, Nevada State Legislature. This caucus is the only chance you will have to have your say in nominating the Presidential candidate of your party.

The Democrats will caucus on Saturday, February 20 and the Republicans will caucus on Tuesday, February 23. As far as I can tell none of the minor parties is having a caucus. There are some things the two parties do the same, and some they do differently. Both parties are holding caucus orientation numerous times between now and the big days.

The Republicans will use a straw poll i.e. a paper ballot; the Democrats vote with their feet by physically walking around the room and grouping near the sign with their preferred candidate's name on it.

In order to caucus, you must be registered to vote *and* you must be affiliated with a party. The two parties have different policies on deadlines by which you must be registered with them. If you are registered as unaffiliated, or not at all, there is still time to change that.

For both the Republicans and the Democrats the February caucus is just the first step in the nomination procedure. You will be selecting delegates from your precinct to attend the county convention, who will in turn select delegates to the state convention, who will in turn select delegates to the national convention. Another thing that will happen at caucuses for both parties is that attendees may submit resolutions to be considered for inclusion in the party platform.

Because the caucuses are organized by precinct, your caucus will be relatively close to home. But it is not necessarily the same place that you usually vote. You can find out your caucus location by checking the party website, and the parties should be sending out postcards notifying you of the locations.

This column leaves a lot of loose ends. Tie them up by checking your party's website:

Republicans:

<http://nevadagop.org/nevada-caucus-2/>

Democrats: <http://nvdems.com/caucus/>

Get out there and make your voice heard!



**The G.S.N. wishes to thank the
SPONSOR OF OUR JANUARY 2016
MEETING in RENO!!**

Envirotech Drilling LLC

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GSN Friday, February 19th Membership Meeting

For dinner reservations, please e-mail gsn@gsnv.org or call 775-323-3500

by 4:00 p.m. on WEDNESDAY, FEBRUARY 17TH!

Social Hour begins @ 6:00 pm; Dinner @ 7:00 pm;

Speaker to Follow @ 7:45 pm

Location: RENO ELKS LODGE, 597 KUMLE LANE (across from the Convention Center)

DINNER COST—\$25.00 per person (Reservation no-shows will be invoiced.)

Guest Speaker: Dr. Mae Gustin, Professor, University of Nevada, Reno

“Mercury emissions from nonpoint sources at Nevada Gold Mines-Do they matter and how to reduce them”
Mae Sexauer Gustin, Professor

Department of Natural Resources and Environmental Science, University of Nevada-Reno

Because mercury (Hg) is a liquid at ambient conditions on the earth, it is readily evaporated to the atmosphere. Thus, the atmosphere is a major pathway by which Hg is globally transported. There are 3 forms of Hg in the atmosphere: gaseous elemental (GEM), gaseous oxidized (GOM: Hg²⁺ and Hg¹⁺ forms, i.e. HgCl₂ and HgO), and particulate bound (PBM). GEM is typically the dominant form in the atmosphere, and can be converted to GOM through reactions with oxidants such as ozone (O₃). Once an atom of Hg (GEM) is emitted from anthropogenic sources (coal combustion, mining, cement production, use in artisanal gold mining) or natural sources (volcanoes, geologically Hg enriched areas), it becomes a part of the global atmospheric pool. This pool has been increasing from baseline natural concentrations due to human activity for 1000's of years. A variety of metal (i.e., Au, Ag, Zn, Pb) mining activities, including actual mining, processing, and waste storage, contribute to these emissions. Emission of Hg occurs from point (stack at a processing plant) and non-point (waste rock dumps, heap leach pads, tailings, ore stockpiles) sources.

All forms of Hg in the atmosphere are deposited to terrestrial and aquatic surfaces. GEM is very transitory, hence the name that is derived from the Roman God Mercury who was said to make swift flights from place to place. Once deposited to any surface, Hg can be emitted back to the atmosphere. Modelers predict it takes 1000s of years for a Hg atom released into the atmosphere to be sequestered in sediments. Of most concern for humans and wildlife is GOM, for it is more bio-available and can be converted to methyl mercury. Methyl mercury affects neurological and reproductive health of organisms.

This talk will focus on 1) discussion of the importance of nonpoint source (waste rock, heap leach, tailings) emissions from Nevada open pit gold mines, and how this was quantified, 2) potential means of reducing these emissions (capping and adding chemicals and microbes), and 3) new information on the form of Hg emitted from specific materials. The latter is important to consider, because no one has previously determined whether GOM is emitted.

**Thank you to the WINNEMUCCA CHAPTER
Meeting SPONSOR for JANUARY!**



**Thank you to the ELKO CHAPTER Meeting
SPONSORS for JANUARY!**



FACES OF GSN

Josh Bonde

Paleontologist, GSN Southern Nevada Chapter President

First, I would like to thank Bob Felder for the honor of being a “Face of GSN.” I guess I always had a bit of a geology bug. I am a born and raised Nevadan, born in Reno and grew up in Fallon. For family vacations growing up we would take road trips across the state to visit family and go fishing in the mountain ranges across the state. Some childhood favorites were Roberts Creek, Kingston Creek, of course Lamoille. I was checking out really cool geology as a kid and not even realizing it. One major epiphany I had as a kid, around 7 or 8, was when my parents took me and my little brother to a dinosaur exhibit at the Lawrence Hall of Science at UC Berkeley. That exhibit was a bunch of life-sized animatronic dinosaurs, with some interspersed real bones. That experience blew my mind. I had always liked dinosaurs, but that experience locked in that I was going to be a paleontologist. Fast-forward, when I was in high school UNR conducted its annual career fair at Churchill County High School. My parents and I were visiting the individual college booths when we happened upon the Mackay School of Mines booth (yes when it was its own college, should still be but that’s another story). A nice lady explained her experiences dinosaur hunting in Montana and that I should do my Bachelor’s degree at Mackay and then go study dinosaurs somewhere else. I blame D.D. LaPointe for recruiting me to Mackay all those years ago haha. While I was a student at Mackay I had the great fortune to be the student worker at the W.M. Keck Museum for 3.5 years, under the supervision of Rachel Dolbier. I am sure that is a familiar name to a number of GSN folks. At the time I was not a very good student and was kind of drifting around my classes, then in 2001 an opportunity came around to help dig up a mastodon outside of Gardnerville. The opportunity, as an undergraduate, to go on a dig and be part of a big research project really got me back on track and inspired me to finish my degree



Josh with a hungry Allosaurus peeking over his shoulder at the LVNHM. Photo by Zack W.

strong. That dig was a joint effort between UNR and Sierra College in Rocklin. The Sierra College professor in charge of the dig, Dick Hilton, became a mentor of mine and is still a friend to this day. He really helped keep me on track and got me thinking about graduate school. After the dig I was asked to help the Nevada State Museum in Carson City with a display of our cool new find. So I worked my butt off cleaning up that mastodon so it could go on display at the State Museum for the opening of their new expansion. Working with the State Museum also opened up some amazing doors for me. Meeting the museum staff and learning from then (and current) Curator of Anthropology and now State Paleontologist Gene Hattori was a real inspiration at that stage in my professional development. I would say to any students reading this narrative, the one thing which has helped my professional growth and development more than anything else has been the help of mentors. I wrapped up my time at Reno and moved to the tundra of Montana State University at Bozeman. My advisor there was a dinosaur paleontologist, Dave Varricchio, and he had a Nevada project on his back burner which he wanted me to work on. Having been a bit of a goof off as an undergrad I was just happy to be in graduate school so was excited to do field work in Nevada when not in Montana. My field area was Valley of Fire State Park, where I thought I would be digging up Cretaceous-aged turtles. Turns out my project turned into a bit more than that. My MS studies ended up characterizing the sedimentology of a formation in addition to describing the first Cretaceous fauna from the state of Nevada. To this day I am still working out at Valley of Fire and finding more and more critters. Currently the list includes: gar fish, lung fish, three types of turtle, two types of crocodile, armored dinosaurs, small and large bipedal plant eaters, sauropods, raptors, tyrannosaurs, advanced allosaurs, and three types of dinosaur eggshell. After freezing my butt off in Montana for 3 years I decided I wanted to come back to Nevada. I was accepted to the UNLV doctoral program under the supervision of Steve Rowland. I can hear all of you Mackay folks yelling “Turncoat!” (cont. on page 5)



Spring Mountain Ranch



The Sump: A group of UNLV paleontologists heads out into the sump of Esmeralda County with Boundary Peak in the distance, on the hunt for Miocene elephants. Photo by Aaron Mayes

(Bonde, cont. from page 4)

through the computer screen as I write this. Here at UNLV is where I met my wife Aubrey, a fellow paleontologist. We now have two beautiful little girls Juniper and Willow who also like digging. At UNLV my studies were kind of a hodgepodge of Cretaceous studies across the state: plants from Valley of Fire, dinosaurs from Nye and Eureka Counties, frogs from White Pine County. But I guess I endeared myself to the faculty here at UNLV that they kept me on as faculty when I wrapped up my studies.

My experience with GSN has always been a great one. I joined GSN when I was a sophomore at UNR. I remember going to the meetings and realizing there were geologists out there doing real work. I remember

the comradery and the great happy hour and dinner as a starving student. When I came back to Nevada for my doctoral studies and found out there was a GSN chapter in Las Vegas I was excited. I told all of my fellow graduate students about my experiences with GSN in Reno, so a bunch of us went to our first meeting. It was a bit of a shock, there was a sandwich platter and a cooler of luke warm beer. Haha. We still had fun and listened to a great talk. At the end of that year I decided to throw my hat in for GSN leadership and was “elected” president of the Southern Nevada Chapter. For my first term I served as president from 2008-2011. During my first reign ,to brag, we took meeting attendance from the single digits to low double digits to averaging attendance at meetings to the 20’s-30’s. We saw some renewed interest in meeting sponsorship, so I felt it was time for me to step down. When I did I agreed to serve as VP to help transition out. Well turns out my successor didn’t do so well so I ended up as an acting president that year. I then handed the reins to Boomer Bain who did a great job in getting the chapter growing and bringing in exciting speakers. Another initiative that Boomer started was to get the GSN UNLV scholarship endowment started. Currently there is no active GSN scholarship at UNLV, we are in the midst of raising money to get that going again (see page 8 for more on this). So when Boomer was getting ready to graduate I was asked to step back into the presidency again. So I am on year 2 of my reign of terror as Southern Nevada Chapter President. In this term, I have moved meetings off of the UNLV campus to the Las Vegas Natural History Museum, where I also serve as the director of conservation and research. We have seen a steady increase in meeting sponsorships and now meeting attendance ranges from the 30’s to 50’s. I know that isn’t much having gone to Reno and Elko meetings but it is a move in the right direction. It has been an absolute pleasure to serve my 5 (well 6) years as a chapter president. Getting to know officers from the other chapters, being involved in two symposia, seeing the continued growth and success and bonding of our southern Nevada geoscience community has been very rewarding. My mom, when she was a little girl, used to have a rock stand in front of the café in Current Creek, where my grandma was the cook. She used to always say how nice those geologists were when they would come to town and lay their core on the tables in the café. Some would even take the time to explain the minerals to her. My mom was right, we belong to a very passionate and intertwined professional community. That said it is our responsibility to mentor and support the next generation of young minds coming up the ranks. Please consider being a mentor. Thank you GSN for all you have done for my career and for the friends I have made across the state. I look forward to many more years to come!



Josh with GSN President Elizabeth Zbinden on the Fall 2014 field trip



UNLV Alumni gathering at the GSN 2015 Symposium party with Prof. Jean Cline who was recently named a GSN Honorary Member



Josh pointing out fossil tracks on the GSN Fall 2014 field trip

GSN SOUTHERN NEVADA CHAPTER MEMBERSHIP MEETING

THURSDAY, FEBRUARY 4, 2016

Location: Las Vegas Natural History Museum,

Time: Pizza & Drinks @ 5:30 p.m., Talk begins @ 6:30 p.m.

SPEAKER: Nick J. Taranik, Project Manager, Hydro Resources—West, Inc.



TITLE: Applications of the Flood Reverse Drilling Method for Mining and Water Wells

Food and Drinks Sponsored by:



The GSN Southern Nevada Chapter welcomes members of the GSN Board of Directors at this month's membership meeting!

GSN ELKO CHAPTER MEMBERSHIP MEETING

THURSDAY, FEBRUARY 18, 2016

Location: The WESTERN FOLKLIFE CENTER, ELKO, NEVADA

Time: Refreshments/Appetizers @ 6:00 p.m., Talk @ 7:00 p.m.

SPEAKER: Andy Baldus, Ore Control Geologist
Barrick Cortez Underground

TITLE: "Application of XRF for Routing Ore"

Food and Drinks Sponsored by:

The logo for Olympus, featuring the word "OLYMPUS" in a large, bold, blue, sans-serif font. Below the word is a thick, horizontal yellow bar that tapers at both ends.

GSN WINNEMUCCA CHAPTER MEMBERSHIP MEETING

WEDNESDAY, FEBRUARY 10, 2016

Location: The MARTIN HOTEL, WINNEMUCCA, NV

Time: Drinks @ 6:00 p.m., Appetizers @ 6:30 p.m., Talk begins @ 7:00 p.m.

SPEAKER: Bill Howald, Rye Patch Gold

TITLE: Geology and Mineralization of the Lincoln Hill Gold and Silver Deposit

Food and Drinks Sponsored by:



Abstract:

Ronaldo M. Pinto da Silva, Senior Geologist, Rye Patch Gold US Inc.

William C. Howald, President, Rye Patch Gold US Inc.

Located in Pershing County, Nevada, within the Rochester mining district, the Lincoln Hill project lies within the emerging Oreana trend (Pinto da Silva and Howald, 2009). The trend is a mineralized northeast-trending alignment of newly discovered deposits and historic gold and silver occurrences that extend from the Willard/Colado (Wilco) area on the southwest and beyond the Rochester and Spring Valley deposits on the northeast.

The Lincoln Hill gold resource is in Early Triassic (~250 Ma) Koipato Group rhyolites that have been pervasively altered to quartz+sericite+pyrite, and locally boron minerals. The Koipato Group is a volcanic-arc terrain consisting of andesite, rhyolite, and volcanic sediments. Within the district, the Koipato Group has been sub-divided into three formations. From oldest to youngest, the oldest is the Limerick Greenstone which consists of outcrops of light to dark green andesite lava, lithic tuff, ash flow tuff, and crystal tuff. Overlying the Limerick is the white- to tan-colored Rochester Rhyolite - the stratigraphic host of the precious metal mineralization at Lincoln Hill. Stratigraphically above the Rochester Rhyolite, a series of rhyolite flows, lenticular conglomerate, and tuff comprise the Weaver Rhyolite. The occurrence of conglomerate sediments is the distinctive characteristic of the Weaver Rhyolite.

The Rochester Rhyolite is divided into three sub units. At the bottom, the basal unit hosts the bulk of the gold and silver and consists of crystal tuff, poly-lithic lapilli tuff, and breccia. Outcrops of the basal unit are pervasively silicified. Mineralized breccias occur along high-angle faults and consist of fragments of felsic volcanic lithologies with minor quartz veins in a fine-grained matrix with abundant exotic limonite and hematite along fractures. Felsic tuff with well-developed cataclastic and mylonitic textures comprise the intermediate unit; this unit is not mineralized. The upper unit is host to the distinctive, ornamental dumortierite-rich rock; in addition, andalusite, tourmaline and massive sericite occur in a pervasively silicified felsic lithology.

Platform limestone of the Prida Formation outcrop on the western side of the property. (continued on page 9)



GSN 2015 Symposium “New Concepts and Discoveries” Proceedings For Sale!



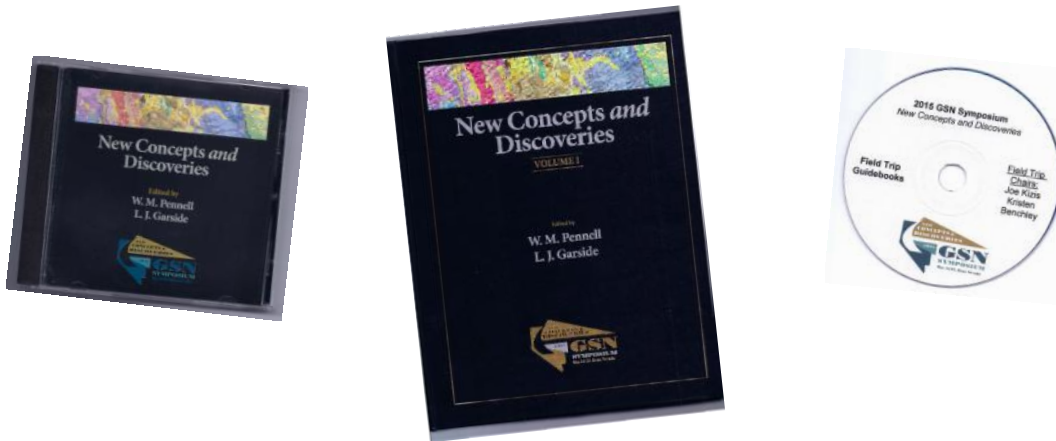
If you haven't heard, the GSN 2015 Symposium Proceedings volumes ARE available for sale at the GSN office! This beautiful 2-volume hardbound set includes 61 technical papers with full color figures from the very successful GSN Symposium held in May 2015. The cost is \$200.00 for the set which also includes a fully-searchable CD for your convenience.

The books can be ordered through the GSN's bookstore:

<http://gsnv.org/publications/?catid=Proceedings> or by calling Laura Ruud at the GSN office, 775-323-3500.

The 2015 Symposium Proceedings are also on CD that can be purchased separately for \$100 + shipping.

ALSO AVAILABLE! The 2015 Symposium ran seven great field trips in conjunction with the May 2015 Symposium. These seven guidebooks can be purchased on one CD for the low price of \$50 + shipping! They are also available for purchase separately in comb-bound paper format. Prices range from \$30—\$45/each. Check with Laura for field trip destinations and individual prices, or visit the GSN's online bookstore to see covers and Table of Contents.



“GEOLOGICAL SOCIETY OF NEVADA” ENDOWED UNLV SCHOLARSHIP FUND

Joshua Bonde, GSN So. Nevada Chapter President

Please consider being a mentor to, or helping us financially support geology students at UNLV. We are already well over halfway to meeting the endowment mark of \$30,000 for establishing a GSN scholarship fund here at UNLV. Please help us meet our goal and show your support for geology students all over the state. You can make a tax deductible contribution at <https://netcommunity.unlv.edu/SSLPage.aspx?&pid=295>, and please be sure to select “Geological Society of Nevada Scholarship” in the designation field.

Also, thank you to the GSN Foundation for its ongoing commitment to yearly contributions to this fund!



SAVE THE DATE!!
SATURDAY, JUNE 18, 2016
GSN'S ANNUAL GOLF TOURNAMENT
WASHOE GOLF COURSE, RENO, NV



Sponsored this year by:





STATE OF NEVADA, COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS

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Las Vegas Office: 2030 E. Flamingo Rd. #220, Las Vegas, NV 89119



NOTICE OF PUBLIC WORKSHOPS

The Nevada Division of Minerals will be holding two workshops pertaining to the amendment of certain regulations relating to its Abandoned Mine Lands Program in Chapter 513 of Nevada Administrative Code. The proposed changes increase the fee imposed on filings of mining claims by \$1.50 per claim to fund activities in the abandoned mine lands program per NRS 513.094, revise the provisions of rating and ranking dangerous conditions, revise the requirements for posting warning signs and methods of securing dangerous conditions, and repeals obsolete language. The proposed regulation changes are available on the Nevada Division of Minerals web site at: <http://minerals.nv.gov/>. Copies can be mailed upon request to the contact listed below.

Workshops will be held at two locations:

Tuesday, February 16, 2016—2:00 P.M. – 4:00 P.M.

Legislative Counsel Bureau- 401 South Carson Street Room #2134 Carson City, NV 89701

Via videoconferencing to Legislative Counsel Bureau Las Vegas Room #4412E

Thursday, February 18, 2016—10:00 A.M. – 12:00 P.M.

County of Elko, Nannini Administration Building 540 Court Street Suite 102 Elko, NV 89801

NOTICE TO PERSONS WITH DISABILITIES

Members of the public who are disabled and require special accommodations or assistance at the meeting are requested to notify the Division of Minerals, 400 W. King Street, suite 106, Carson City, NV 89701 or contact Valerie Kneefel at (775) 684-7043 or Email Vkneefel@minerals.nv.gov

(Pinto da Silva/Howald abstract, cont. from pg. 7)

The limestone is in thrust contact with the volcanic units of Rochester and Weaver Rhyolite. Gold- and silver-bearing jasperoid, hydrothermal breccia, and low-angle faults occur along the north-south fold and thrust belt associated with the Jurassic Fencemaker-Luning thrust. Exploration drilling along the thrust at the Gold Ridge project has returned significant gold and silver from the folded and thrust limestone and mudstone.

Regionally, the mapped units form a broad north-south oriented, south plunging anticlinorium within the Humboldt range. A series of northwest-trending lamprophyre dikes are the youngest features mapped, and they exhibit localized argillization but are not foliated. The dikes have a mineralized quartz stockwork along the contact with the host Rochester Rhyolite. The Lincoln Hill gold and silver mineralization is strongly correlated with the quartz stockwork.

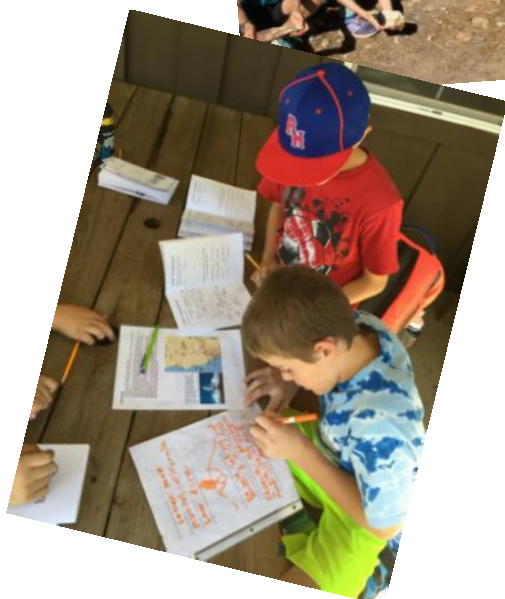
At Lincoln Hill, electrum occurs in several generations of mm-cm-wide quartz-carbonate-tourmaline-sulfide mineral veins. Although Vikre's interpretation suggests the Koipato Group-hosted deposits are Cretaceous (~100-75 Ma) or older, and interpreted as intrusion-related and orogenic, at Lincoln Hill mineralization follows northwest oriented lamprophyre dikes that are altered but not foliated. These relationships suggest the mineralization is associated with northeast-southwest extension. Based on observations at Lincoln Hill and the Rochester district, silver mineralization is most prominent along north-south and northwest structural trends. Elevated gold favors the northeast structural sets, and high gold and silver occur at the structural intersection of these sets within the basal sub unit of the Rochester Rhyolite.

Production and resources of large-tonnage precious metal deposits (collectively ~1 Gt) in the Humboldt Range and adjacent West Humboldt Range exceed 270 Moz silver and 14 Moz gold. Although deposit grades are mostly <1 opt silver and <0.03 opt gold, relatively uniform dispersion of gold and silver minerals, favorable stripping ratios, and 60-90% heap leach recoveries have sustained bulk-mining of the Coeur Rochester and Florida Canyon deposits since 1986, enabled bulk-mining of the Nevada Packard (1912-1923), Standard (1939/1949), Relief Canyon (1984-1990), and Willard (1989-1994) deposits, and portend mining of the Spring Valley, Lincoln Hill, and Wilco (Willard and Colorado) resources.

At present, the Lincoln Hill project is in a feasibility study. The current work program is focused on metallurgy, in-fill drilling and permitting. Approximately US\$500,000 has been expended on an exploration plan of operations with expected completion in 2016. Once the permit is in hand, a 20,000-meter exploration and in-fill drilling program along with a bulk sample is budgeted. The Lincoln Hill Project is a high-grade, gold-silver-quartz-pyrite-tourmaline-sericite stockwork vein system atop a large low-to-moderate grade intrusive related gold system at depth.

GSN FOUNDATION DONATIONS HELP NEVADA KIDS GET OUT OF THE CLASSROOM AND INTO GEOLOGY!!

5th Grade Teacher Ryan Brock at Jessie Beck Elementary School in Reno sent us photos from their class field trip that was funded by the GSN Foundation last year and again this year. The class goes on a multi-day overnight trip to Portola and hike up Lassen Peak. They model and learn about volcanoes (I think you can see the drawings they are making of magma chambers outside on picnic tables) and they look at the moon thru telescopes - more effective there under dark skies away from cities. They are cool photos! It's always nice to see your donation dollars at work for hands-on education!



GSA CORDILLERAN SECTION ANNUAL MEETING

Dear friends of Mesozoic rocks, tectonics, & ores,

I am writing to highlight a session that Claire Bucholz & Jason Price (Caltech), and I (John Dilles, OSU) are convening at the **Cordilleran Section, GSA Annual Meeting in Ontario, CA on 4-6 April, 2016:**

T4. Linking Mesozoic Arcs, Tectonics, and Mineral Deposits: *Focused interdisciplinary studies and new methods (e.g. Ar-Ar and U-Pb zircon ages) are yielding considerable new understanding of the Triassic and Jurassic sections of the Cordilleran arc. Contributions that focus on tectonics, magmatism, metamorphism, of these rocks are sought to shed light on the underlying causes on metallogeny in the Cordillera.*

We also suggest looking at other sessions and the great line-up of pre- and post-meeting field trips. It should be an excellent meeting with quite a diversity in topics covered.

Sessions: <http://www.geosociety.org/Sections/cord/2016mtg/techprog.htm>

Field trips: <http://www.geosociety.org/Sections/cord/2016mtg/fieldTrips.htm>

You can go to the main meeting website: (<http://www.geosociety.org/Sections/cord/2016mtg/index.htm>) to submit an abstract and/or register for a field trip (opens in January).

Hope to see you in Ontario!

John Dilles

Professor of Geology

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Ralph J. Roberts
22nd Distinguished Lecture
in
Economic Geology

February 4, 2016
3:30 p.m.

Joe Crowley Student Union, Theater

Dr. Peter Vikre, USGS
Guest Speaker

“Diverse Mineral Deposits in the Humboldt Range, Pershing County, Nevada: A 250 my Record of Magmatism, Metasomatism, and Tectonism”

Sponsored by the
Department of Geological Sciences &
Engineering,
Nevada Bureau of Mines & Geology,
and the
Ralph J. Roberts Center for Research
in
Economic Geology (CREG)

Mackay School of Earth Sciences & Engineering



Mark your calendars for the GSN's Spring 2016 Field Trip scheduled to be held on May 6, 7, 8, 2016. The field trip will be going to locations in the Carlin Trend!

Thank you to our generous donors in January!

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garycliftongeo@gmail.com



Excerpt from Geology.com "Diatomite—The sedimentary rock used as a filter, absorbant, filler, abrasive and more"

Diatomite has a very small particle size, a high porosity, and is relatively inert. That makes it an excellent material for use as a filter. Much of the beer brewed in the United States is filtered through crushed diatomite, known as diatomaceous earth. When selecting diatomite for beer filtering, it is important to source the diatomite from a deposit that was formed in a freshwater environment - because the salty marine diatomites will ruin the beer! Diatomaceous earth is also used to filter wine, drinking water, syrup, honey, juice, swimming pool water, and much more. Image © iStockphoto and nitrub.

Read the whole article at: <http://geology.com/rocks/diatomite.shtml>

Discovery History of Gold Field's Chimney Creek gold deposit.

GSN Member Art Leger recently published a blog on the Discovery History of Gold Fields' Chimney Creek gold deposit on Atoka Gold's website. Here is a link to the blog if you are interested!

<http://www.atokagoldexploration.com/blog-posts/discovery-history-gold-fields-chimney-creek-gold-deposit-greenfield-exploration-endeavor/>

Art plans to do Mule Canyon in the very near future.

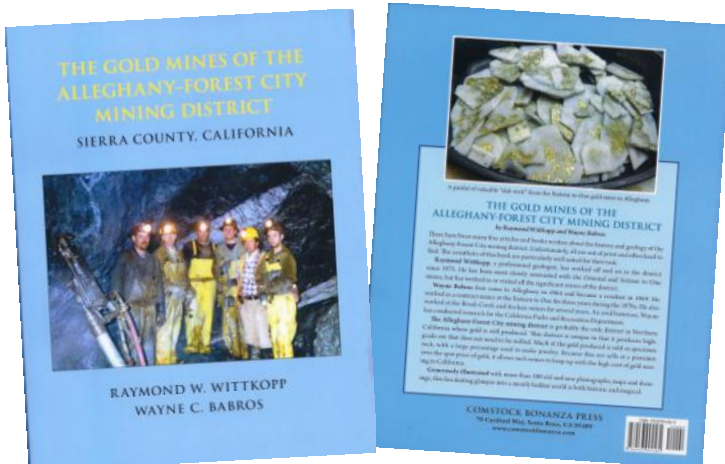
Arthur R Leger, VP Exploration
Atoka Gold Corporation

775.560.2856, Arthur@AtokaGold.com



GSN Member, Raymond Wittkopp sent me a copy of his book titled "The Gold Mines of the Alleghany-Forest City Mining District, Sierra County, California" that I thought some of you might be interested in! It can be found at Comstock Bonanza Press!

<http://comstockbonanza.com/products>



NEWS RELEASE

January 6, 2016

2015 Mining Fatalities Decrease

Dramatically -MSHA credits advancement of health and safety practices

The mining industry has set a record low for fatalities in United States operations. According to preliminary data released by [MSHA](http://www.msha.gov), deaths dropped from 45 in 2014 to 28 in 2015 – a nearly 40 percent decrease. This figure indicates the lowest number ever recorded and the first year that mining deaths dropped below 30. Preliminary data indicates that 11 miners died in work-related accidents at coal operations in 2015, and 17 miners died at U.S. metal and non-metal operations.

"The safety and health of our Nation's mining workforce is paramount," stated SME Executive Director David L. Kanagy. "Mine safety is extremely important to SME as evidenced by our creation of a Health and Safety Division, as well as an increase in the number of technical sessions and symposia focused on worker safety. We are pleased to see the industry's progress toward achieving the goal of zero fatalities and a 50 percent reduction in rate of injuries by 2020."

Assistant secretary of labor for mine safety and health, Joseph A. Main, also credits the agency's use of strategic enforcement tools, compliance assistance, training and outreach efforts to the mining industry as major factors in the improvement of mine safety.

For more information, contact Jackie Dorr, Communications Manager, (303) 948-4244 or dorr@smenet.org.

SME exists to be the premier resource and advocate for the mining community. For further details, see www.smenet.org.

Mining's largest professional society holds annual meeting in Phoenix

SME's Annual Conference & Expo includes special keynote session

The theme of the Society for Mining, Metallurgy & Exploration Inc.'s (SME) 2016 Annual Conference & Expo is "The Future For Mining In A Data-Driven World." The conference will be held February 21-24 at the Phoenix, AZ, Convention Center. With a focus on growth, the mining industry must prepare for technology advances, new legislation, market trends and economic changes using the data available from a myriad of sources.

For more information on the 2016 Annual Conference & Expo, please visit www.smeannualconference.com/.

ROCK TALK

It was 5 years ago, on February 16, 2011, that Geologist and long-time GSN member, Karl Frost left this earth, but he left behind this poem that a colleague and friend requested that I share with other GSN members.

"Mommas Don't Let Your Kids Grow Up to be Geologists"

Mommas don't let your kids grow up to be geologists
They will spend their days in pickup trucks driving dusty, rough roads
Miles to go before they work and miles to travel to get back home
They'll spend four years in school learning all there is
Then they will learn that two more years of school are needed to get a job
Teachers will pack them in vans and drive them around in the midday heat
Never telling them where they are or where they are going
The students will have to memorize hundreds of mineral names and chemical compositions

They will spend hours looking one-eyed down microscopes at pieces of rocks
They will play with sand boxes and topo maps
It will take hours drawing on paper to decipher fault displacements
After years in school they will dress up in unaccustomed finery to get jobs
The company will give them trucks and expense accounts
They will get their own desks and find out that plumbers make more money
Their days will be spent walking in the hot sand, dodging rattlesnakes and bulls
Ranchers will shoot out their tires and refuse permission to enter BLM land
Government workers will harass them with a myriad of senseless rules
They will occasionally make mistakes and sometimes feel like fools
Fellow geologists will disagree with their ideas and say they are fools
Drillers will cuss and spit on the geologist's boots
Helpers will come and go and still make more money than the geologists

But geologists get to hike in the woods, take picnic lunches and snap pictures of pretty wild flowers
They will get to fly in helicopters and chase moose and caribou
They will see wolves, deer, lakes and big brown bears from the air
The chopper or truck will break down and they will walk for hours to get help
They will get sunburned, bug bit, rained on and become lost in a sandstorm
They will get lost in the bayous and have to make an alligator pirogue to get out
They will end up so sweaty and rank that even skunks will turn away
The new drill bit will come at 4:30 Friday and the rig will be 80 miles out
The boss will never be satisfied with the footage or the mineral grade
The board of directors will always want more than you find - 100 million tons is too little

They will get married and spend only Christmas at home
Their lives will be spent in one-horse flea-bitten towns
The motels will always be next to the highway and the truck stop
The maids will be grumpy and the beds will be lumpy
The cafes will be greasy spoons that serve Roloids for dessert
The only good-looking woman in town will be married or jail bait
The men would just as soon shoot you as talk to you

If the geologists are women the men will be rough, tough, and lecherous
It will take two years to get the waitress to laugh at your jokes
The nicest waitress will be from the prison across the road
They will get arthritis from pounding on rocks and rock chips in their eyes
They will get cancer on top of their ears from the sun
But when the race is over and the fight is done
They will all say "I guess I'd do it all again"

Activity Update

Mike Brady, December 2015

www.activityupdate.com

NEVADA

Carnavale Resources Ltd.(75%) announced that recent drill results at the Red Hills Project include 129-141 meters @ 179 gpt Ag, 0.20 gpt Au, 3.29% Pb, 1.18% Zn (15RHR03). *Press Release: December 8*

Waterton Precious Metals Fund II announced that it cancelled its proposed acquisition of Timberline Resources Corp. (resource @ Lookout Mountain = 26,254,000 tonnes @ 0.62 gpt Au measured+indicated) *Press Release: December 3*

Gold Resource Corp. announced that it acquired an option to earn a 100% interest in the Gold Mesa Property from Infrastructure Materials Corp. for \$391,500 cash and \$1,200,000 in shares over 3 years. *Press Release: December 1*

Pershing Gold Corp. announced that recent drill results at the Relief Canyon Project include 49.87-57.18 meters @ 0.26 gpt Au (RC15-392); 29.85-34.72 meters @ 1.52 gpt Au (RC15-407); 189.50-202.02 meters @ 0.39 gpt Au (RC15-411) and 96.46-108.73 meters @ 3.72 gpt Au (RC15-421). (resource = 24,270,000 tonnes @ 0.68 gpt Au measured +indicated) *Press Release: December 15*

Nevada Sunrise Gold Corp. announced that it acquired an option to earn a 100% interest in the Jackson Wash Property (Li) from private interests for 500,000 shares over two years. *Press Release: December 22*

Klondex Mines Ltd. announced that recent drill results at the Fire Creek/Karen Vein Project include 0.9 meters @ 95.9 gpt Au (FCU-0442); 1.6 meters @ 104.7 gpt Au (FCU-

0470) and 2.1 meters @ 44.3 gpt Au (FCU-0507A). (reserve = 168,900 tonnes @ 43.85 gpt Au, 31.6 gpt Ag proven+probable) *Press Release: December 10*

Quaterra Resources Inc. announced that recent drill results at the Bear Project include 578.03-1,065.06 meters @ 0.26% Cu, 0.007 gpt Au (B-049). *Press Release: December 23*

McEwen Mining Inc. announced that it purchased a 100% interest in the Afgan-Kobeh Property from NV Gold Corp. for \$450,000 cash. (resource = 1,682,000 tonnes @ 0.92 gpt Au indicated) *Press Release: December 21*



The 2016 Women's Mining Coalition dues campaign has begun! Please consider joining or renewing your WMC membership. WMC is a diverse group of women who work in mining and its affiliated industries. Benefits of being a WMC member include connecting with this accomplished network of women in advocating for mining and continuing to be informed of the issues facing the industry. WMC will keep you up to date regarding current and pending mining-related legislation, and let you know when you can make your voice heard in Washington DC and in your home state.

2016 WMC dues can be paid by visiting the website, www.wmc-usa.org, and paying through Paypal. Please consider adding a donation to your \$30 annual dues payment; these donations add up in a big way and keep WMC operating in these challenging economic times. If you would like to receive a membership form that you can complete and send in with a check, please email Lynne Volpi, WMC Coordinator, at info@wmc-usa.org.

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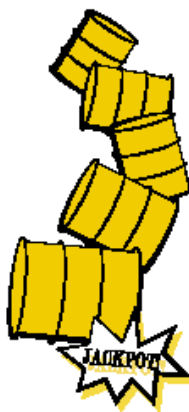
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AAPG

Pacific + Rocky Mountain Joint Meeting

2-5 October 2016
Paris Hotel, Las Vegas

Call for abstracts: 2015 Rocky Mountain Section of the Geological Society of America Annual Meeting, May 2016, University of Idaho, Moscow, Idaho

The Economic Geology Session (#11) is entitled: *Mineral Deposits and Metallogeny of Western North America*

The link to the meeting announcement is: [http://
www.geosociety.org/sections/rm/2016mtg/techprog.htm](http://www.geosociety.org/sections/rm/2016mtg/techprog.htm)

The links for abstracts which must be submitted on-line
is: <https://gsa.confex.com/gsa/2016RM/cfp.epl>

OTHER UPCOMING EVENTS

2 FEBRUARY 2016 Arizona Geological Society, Tucson AZ. Speaker: Dr. Karen Wenrich presents "The Ga-Ge Rich Apex Mine, Utah - A Tsumeb, Namibia Analogue". Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson AZ 85712 . Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson AZ 85712. Begins @ 6 pm. For more information go to: www.arizonageologicalsoc.org.

4 FEBRUARY 2016 Nevada Petroleum & Geothermal Society, Reno, Nevada monthly meeting. Cocktails at 6:30 PM, Dinner at 7:00 PM, Ramada Reno Hotel; 1000 East 6th St., Reno NV 89512. Speaker: **Ileana Tibuleac, PhD, Research Seismologist, UNR, TOPIC: Development of a Low Cost Method to Estimate the Seismic Signature of a Geothermal Field from Ambient Seismic Noise Analysis** Please RSVP by Tuesday, February 2, 2016. Please make reservations by using the following link: <https://docs.google.com/forms/d/1ahTxXXoE4WA5tlxhmpsQn10-VZ8x6jyDcJUireWT7E/viewform>

8 FEBRUARY DREGS, Denver Regional Exploration Geologists' Society. Social hour: 6:00 pm, Presentation: 7:00 p.m. at CSM Berthoud Hall, Room 241, Golden, CO. Speaker: John Dreier, CPG, Golden CO. Title: "Epithermal Silver Veins: Some Thoughts on Their Exploration and Genesis". Contact James Piper for more information: geopros@q.com

8 FEBRUARY Northern Nevada Section of SME Monthly meeting. Circus-Circus Mandalay Ballroom, Reno NV. Happy Hour @ 6 pm, Dinner starting at 7 pm. Presenters: **UNR Student Researchers and Groups, Mackay School of Earth Science and Engineering.** This meeting will showcase the work that UNR students are doing through the Mackay School, the Mine Design team, and UNR Senior Field Trip Dinner Cost \$30 per person-Members, \$35 per person-Non members. Please RSVP by Wednesday, February 3, 2016 to Brooke Miller NnevSME@gmail.com.

11-14 FEBRUARY Tuscon Gem & Mineral Show, "Shades of Blue: Minerals of the World". SMG-Tucson Convention Center. For days, times and ticket information: [Click here](#). Tickets available starting Thursday, January 14, 2016. [Click here to be notified when more information is available](#). For information on TGMS Dealers or interested in participating as a TGMS Dealer? [Click here](#)

5-8 MARCH Prospectors and Developers Assoc. of Canada—PDAC. Where the World's Mineral Industry Meets. Toronto, Ontario. Go to the link to find out more information. <http://www.pdac.ca/convention>

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2016 NWRA Annual Conference Week, February 29-
March 3, 2016 in Las Vegas, Nevada will consist of:

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- AQTESOLV
- Vulcan
- Advanced Water Rights
- FEFLOW
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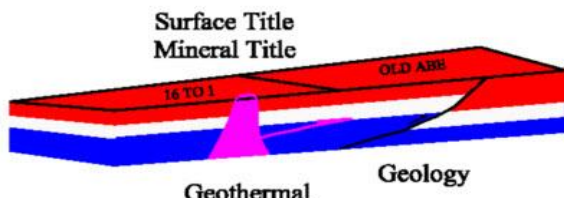
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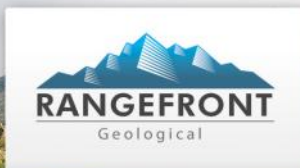
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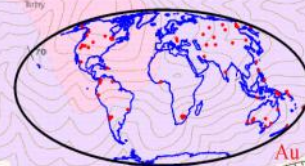
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