



# GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512  
(775) 323-3500 - Hours Tuesday -- Friday, 9 a.m. to 4 p.m. Monday by appointment.

Website: [www.gsnv.org](http://www.gsnv.org) • E-mail: [gsn@gsnv.org](mailto:gsn@gsnv.org)



October 2018, Vol. 34, No. 8

Published monthly except June and July

## PRESIDENT

Richard Bedell  
Renaissance Gold  
[rbedell@rengold.com](mailto:rbedell@rengold.com)

## VICE PRESIDENT

Dennis Bryan  
Consultant  
[dpbryan@sbcglobal.net](mailto:dpbryan@sbcglobal.net)

## SECRETARY

Steven Weiss  
Consultant, Geologist  
[siraweiss@outlook.com](mailto:siraweiss@outlook.com)

## TREASURER

Bob Kastelic  
McEwen Mining  
[bob\\_kastelic@yahoo.com](mailto:bob_kastelic@yahoo.com)

## MEMBERSHIP CHAIR

Molly Hunsaker  
Hunsaker Inc.  
[mollymhunsaker@aol.com](mailto:mollymhunsaker@aol.com)

## PUBLICATION CO-CHAIRS

Ruth Carraher, C&M Consultants  
[racarraher@gmail.com](mailto:racarraher@gmail.com)

Shannon Gill, Kinross Gold  
[shannon.gill@kinross.com](mailto:shannon.gill@kinross.com)

## EXECUTIVE MANAGER

Laura Ruud, [gsn@gsnv.org](mailto:gsn@gsnv.org)

## GSN BOARD OF DIRECTORS

Chairman  
Robert Thomas

Current GSN President:  
Richard Bedell

Most Recent Past GSN President  
Kelly Cluer

Elko Chapter President  
Nathan Wright

So. Nevada Chapter President  
Joshua Bonde

Winnemucca Chapter President  
Matthew Fithian

Class A, 2018-2021  
Robert Thomas-CHAIR  
John Watson

Class B, 2016-2019  
David Caldwell  
Greg French

Class C, 2017-2020  
David Shaddrick  
Camille Prenn

## CALENDAR OF GSN EVENTS

- Oct. 5-7, 2018** **GSN FALL 2018 FIELD TRIP**  
**GSN Fall Field Trip**  
Another great GSN Fall Field Trip has been planned and will take us to the Mono Lake – Mammoth Lakes area in east central California.  
**REGISTRATION IS CLOSED**
- Oct. 4, 2018** **SO. NEVADA CHAPTER MONTHLY MEETING (held 1st Thursdays)**  
**THURSDAY**  
The monthly meeting will be held at the Las Vegas Natural History Museum, 900 N. Las Vegas Blvd. Pizza & beer at 5:30 pm, Talk at 6 pm. **Speaker: Simon Jowitt Ph.D, UNLV. Title: “Global mineral resources; land of plenty, or are we running out?”** **Any company want to sponsor \$250?** Contact Joshua Bonde for more information. Josh’s email is: [paleo@lvnhm.org](mailto:paleo@lvnhm.org). Details on page 6.
- Oct. 10, 2018** **WINNEMUCCA CHAPTER MEETING (held 2nd Wednesdays)**  
**WEDNESDAY**  
The Winnemucca meeting will be held at the Martin Hotel, 94 W. Railroad St., Winnemucca. Refreshments/appetizers at 6 pm. Talk at 7 pm. **Speaker: Patricia Capistrant. Title: “Fitting the Enterprise Hydrothermal Nickel Deposit into the Sedimentary-Hosted Copper Deposit Model: Best Guess and Abundant Arm-Waving”.** **Food & Drinks sponsored by TBD.** For more information please contact Matt Fithian at: [Matthew.Fithian@ssrmining.com](mailto:Matthew.Fithian@ssrmining.com). Details on page 7.
- Oct. 18, 2018** **ELKO CHAPTER MONTHLY MEETING (held 3rd Thursdays)**  
**THURSDAY**  
The Elko meeting will be held at the Western Folklife Center, 501 Railroad St., Elko. Refreshments/appetizers begin at 6 pm. Talk begins at 7 pm. **Speaker and Topic To Be Announced . Food & Drinks Sponsored: TBD .** For more info. please contact Nathan Wright at: [Nathan.Wright@newmont.com](mailto:Nathan.Wright@newmont.com). Details on page 6.
- Oct. 19, 2018** **GSN MEMBERSHIP MEETING (held 3rd Fridays)**  
**FRIDAY**  
The GSN meeting will be held at the Reno Elks Lodge, 597 Kumle Lane, Reno, Nevada. Social hour begins at 6 pm, Dinner at 7 pm and talk at 7:45 pm. **Speaker: Paul Linton, TerraCore. Topic: Geometallurgy. Drinks sponsored by BOART LONGYEAR.** Please send dinner RSVPs to Laura Ruud at: [gsn@gsnv.org](mailto:gsn@gsnv.org). Details on page 3.

## G.S.N. OCTOBER MEETING SPONSOR



**BOART  
LONGYEAR™**

**FROM THE PRESIDENT**  
**Richard Bedell, GSN President 2018-2019**  
**OCTOBER 2018**

---

This Month's talk will be by a relatively new Nevada resident Paul Linton from South Africa. Not only is Paul a superb global economic geologist but he was also head of geometallurgy for De Beers.

This subject should be more integrated into exploration than it commonly is. The Society of Economic Geology Newsletter started a geometallurgy column some years ago to help address this deficiency. If you are an ECONOMIC geologist it is not just geology, grades and tons, you need to understand early on how complex and recoverable the ore is otherwise it may not be "ore".

In the 1980's I used to run an exploration program in Burundi Africa. I hired an ex-pat mining engineer to be part of the exploration team. This I felt was essential because we were doing bulk sampling on eluvials and extracting gold on shaking tables and trommels to quantify the grade. Assay labs were far away and we had to have more data than what exporting samples would allow. But, also this exercise allowed us to see what gold was obtainable, not all the gold came back in an assay.

In Nevada I encourage all explorationists to run simple cyanide leach on all assays at some relevant level that might be considered ore and that might be a gram or half gram, or something much higher if an evolving underground target is envisaged. You need to know early on if your 2 g/t Au zone is silica encapsulated or not.

It is shocking how many exploration groups do multiple rounds of drilling, spending millions of dollars before they finally do metallurgy and find out none of it is economic. It works the other way as well. That annoying sub-gram material might leach like gangbusters, and actually, be worth more than you think.

Geometallurgy is defined as the merging of metallurgy and geospatial statistics. Of course, to do geospatial statistics you must have accurate geology that constrains the model, and that is a paraphrase from Krige himself. Geometallurgy is as important as grades and tons in a block model for economic analysis. Factors such as grain size, shape and texture, hardness, grindability index, clay content, copper content, are some of the many factors that determine what part of a block model is mined or sent to a different metallurgical circuit. Some complex ores such as at Phoenix Mine here in Nevada have three metallurgical circuits which creates enormous challenges in the mining process. Of course, this all relates to geology and more specifically to mineralogy.

Pure mineralogical models have a method designed initially by Lamberg (2011) that include 3 sub-models. The geologic model is designed by modal mineralogy combined with texture. The process model takes the mineralogical model and defines metallurgical performance on a block scale. Finally, the production model combines the geologic and process model to optimally manage the production.

The key is getting a reliable mineralogical model. In the past metallurgical testing was done on highly selective samples based on geology, often the error was too high to make reliable models, particularly for life of mine whereby production can work through a high variance of geology and metallurgy.

Today we have the advent of hyperspectral core scanning that can provide continuous mineralogical data. Not only can this data provide what the mineral is, but often map cation substitution. Thus, the data are very useful for ore vectoring in the exploration stage.

Exploration is looking for economic deposits, therefore doing simple metallurgy at the beginning of a program is a wise thing to do as this should dictate how to explore. Doing quantitative mineralogy early in a program should not only assist the exploration phase but provide the engineering phase with the data they need. Too often engineers step in after a successful exploration program and redo almost everything. Exploration to production should be more of a transition with explorationists appreciating more of what is required to make a mine and getting the basic information early.

Richard Bedell

GSN President

Lamberg, P. 2011, Particles – the bridge between geology and metallurgy: Proc. Conference in Mineral Engineering, Lulea Sweden, pp. 1-16.

***The G.S.N. wishes to thank COEUR EXPLORATIONS, INC.***  
***For sponsoring the GSN's September 28th meeting in Reno!***



# **GSN MEMBERSHIP MEETING—OCTOBER 19, 2018**

---

**For dinner reservations please e-mail [gsn@gsnv.org](mailto:gsn@gsnv.org) or call 775-323-3500 by 5:00 p.m. on Wednesday, October 17, 2018**

**Social Hour begins @ 6:00 p.m.; Dinner @ 7:00 p.m.**

**Speaker to follow at about 7:45 p.m.**

**SPEAKER: Paul Linton, TerraCore**

**TITLE: “Geometallurgy and Quantitative Mineralogy using Hyperspectral Core Imaging”**

**Location: Reno Elks Lodge, 597 Kumle Lane**

**(across from the Convention Center)**

**Dinner Cost is \$25.00 per person**

**(You will be invoiced if you do not cancel your reservation)**

---

## **Geometallurgy and Quantitative Mineralogy using Hyperspectral Core Imaging**

Paul Linton, TerraCore

An understanding of geometallurgy early on in an exploration project can help determine where exploration funding should be focused and lead to a higher frequency of economic discovery. In exploration, metallurgy, and mining quantitative mineralogy is key.

Hyperspectral core imaging involves the collection of high spectral and spatial resolution data from the surface of drill-cores and chips that permits identification and mapping of a wide suite of minerals; importantly with their textural context preserved. The technology is becoming established as a routine means to record, archive and interrogate digital mineralogical data at low cost. These data aid geologists in extracting maximum value from their drill materials. The ability to deploy mobile instruments to remote sites, the rapid collection of data, and the opportunity to examine lithology and alteration in a collaborative environment, allow for decision making to be advanced with consequent savings in time and capital. The addition of the thermal, or long-wave, infrared data adds an extra dimension and expands the range of minerals that can be directly detected and mapped.

Case studies incorporating 3D geometallurgy into mine models involving a variety of geologic environments and applications will be presented to demonstrate the value that the technology can bring from grassroots exploration through production.

# “FACES OF GSN”

## Sage Gandolfo

[Sgandolfo@nevada.unr.edu](mailto:Sgandolfo@nevada.unr.edu)

I began my geological endeavors from the day I could physically scoop up a handful of dirt and stick it straight in my mouth. My artist parents would yell at me “get that stuff out of your mouth!” but I would crawl away on my hands and knees and find more neat rocks that needed tasting.

I was born and raised in Reno, Nevada but I like to call myself a true native Nevadan for having scaled just about every mountain range and valley in the state. My parents are craftsmen as my mother recently retired from Reno High School teaching art and my dad a professor at UNR teaching photography and videography with hobbies of being a diesel mechanic. I grew up with a fond adoration for the arts and among painting, pottery, and knitting, my parents took my older brother and I camping almost every single weekend of my life. And this was no RV hookup camping. This was always rural Nevada somewhere many miles from other people where we rode our dirt bikes up every mountain range, rain or shine. We would often be north of Austin, NV where my family originates from.

I graduated a year early from Reno high school in 2014 and started college the same year as a Wildlife ecology major in hopes that this career would always be outside in the mountains with my favorite pinyon pine and juniper trees. After taking Geology 101 I was hooked and changed my major excitedly. I soon became officers for the Mackay Rockhounds geology club, John Mackay club, and Mackay Muckers. I also joined the Society of Economic Geologists student chapter at UNR and traveled to Finland in 2017, Japan in 2018, and will be heading to Chile to look at copper-porphyry deposits in January 2019.



*Summer 2017 NV Division of Minerals; Pounding a t-post in the ground to build a fence around a shaft*



*2017 SEG student chapter field trip; Sillinjärvi carbonatite mine in Finland*

My first internship was with Friends of Nevada Wilderness in 2016 where we trekked deep in the Forest Service wilderness areas all over NV. We carried pulaski's, axes, saws, and shovels on our backs to hike 10-20 miles a day to restore trails that we all enjoy hiking or using for hunting. Every 10 days we spent in the wilderness we either horse packed our gear in or just packed in on foot. I gained a considerable amount of appreciation for hard work and manual labor that summer.

The next opportunity in 2017 was interning for the Nevada Division of Minerals Abandoned Mine Lands Program.

The eight of us on the crew would head out in the field every week and track down shafts and adits that old miners (continued on page 5)

(Sage Gandolfo, cont. from page 4)

dangerously left in their day. We built barbed wire fences and marked everything we found across the entire state as safe or hazardous. I've never had more fun laboring around NV with copious amounts of BBQ and playing cards every night with some of the hardest working people I know.

After another year of grinding through college I was fortunate to land a Geology internship for Barrick out at Turquoise Ridge in summer of 2018. I spent the summer designing the three-year infill drill program and going underground with ore control. My family has a mining background out of Austin, NV so being able to see exactly what makes a mine function was really rewarding. I made many friends and great connections over my time at the mine and in Winnemucca and will be heading back to intern over the winter.

The annual mining competition will be in March of 2019 in Virginia City, NV and the Mackay Muckers will hopefully have a kick-butt girls team, so come support! Next, field camp is what I have in store for the summer of 2019 after I graduate in May and I'm ecstatic to get out there and map. After field camp I plan to travel for a few months before going back to work full time.

Thank you again Molly and Laura for considering me for "Faces of GSN"!



*Summer 2018 at Barrick's Turquoise Ridge; Underground looking at ore*



*2018 SEG student chapter field trip; the-Sakurajima volcano in Japan erupting behind me*



*Laura's photo & note: Sage has also attended several GSN Field Trips thanks to the donations of our members to the Student Field Trip Fund. L. to R. Sage, Tenaya Brown & Aaron Rimshaw at Rawhide, Fall 2016*

**GSN SOUTHERN NEVADA CHAPTER MEETING**

**THURSDAY, OCTOBER 4, 2018**

**Location: Las Vegas Natural History Museum, Africa Hall**

**900 Las Vegas Blvd. North, Las Vegas, NV**

**(please park behind the museum)**

**Time: Pizza & Drinks @ 5:30 p.m. with Talk to follow**

**Speaker: Simon Jowitt Ph.D, UNLV Economic Geology Professor**

**Title: “Global mineral resources; land of plenty, or are we running out?”**

**Food and Drinks Sponsored by: LOOKING FOR A SPONSOR**

**Cost: \$5 donation for non-students**

---

**GSN ELKO CHAPTER MONTHLY MEETING**

**THURSDAY, OCTOBER 18, 2018**

**Location: Western Folklife Center, 501 Railroad Street, Elko, Nevada**

**Time: 6:00 p.m.—Appetizers/drinks; 7:00 p.m.—Talk begins**

**Speaker: TO BE ANNOUNCED**

**Topic: TO BE ANNOUNCED**

**Food and Drinks Sponsored by:  
TO BE ANNOUNCED**

# GSN WINNEMUCCA CHAPTER MONTHLY MEETING

**WEDNESDAY, SEPTEMBER 19, 2018**

**Location: The Martin Hotel, 94 W. Railroad St., Winnemucca, NV**

**Time: 6:00 p.m.—Appetizers/drinks; 7:00 p.m.—Talk begins**

**Speaker: Patricia Capistrant**

**Title: Fitting the Enterprise Hydrothermal Nickel Deposit into the Sedimentary-Hosted Copper Deposit Model: Best Guess and Abundant Arm-Waving**

**Food and Drinks Sponsored by: To Be Announced**

## **ABSTRACT:**

**Fitting the Enterprise Hydrothermal Nickel Deposit into the Sedimentary-Hosted Copper Deposit Model: Best Guess and Abundant Arm-Waving**

Patricia Capistrant

Sediment-hosted copper deposits account for 23% of the world's copper production and deposits. Sedimentary basins hosting this style of mineralization are typically intracratonic with basal siliciclastics (red beds) overlain by an upward deepening sequence of shales and carbonates. Basin-scale fluid circulation is thought to be responsible for scavenging of metals from the red bed sequences into chloride complexes and precipitation of sulfide disseminations and veins at redox boundaries. Sulfur is provided in situ as diagenetic pyrite (through BSR or TSR) or through production and migration of sour gas (H<sub>2</sub>S). Absolute and relative ages show mineralization occurred during and after diagenesis. Epigenetic deposits are almost always associated with orogenesis and basin inversion. Super giant deposits such as those hosted in the Central African Copperbelt share similar characteristics including 1) intracratonic basin formation at low latitudes, 2) salt deposits, and 3) long periods of basinal fluid flow with relative tectonic quiescence.

Sediment hosted copper deposits of the Central African Copperbelt occur primarily within Neoproterozoic metasedimentary rocks of the Katangan Supergroup, which were deposited within a series of intracratonic basins during the formation of the Rodinian supercontinent. Paleoproterozoic basement rocks are unconformably overlain by rift-stage Katangan siliciclastics and post-rift carbonates, evaporites, and siliciclastics. Evidence for large volumes of salt exist as polyolithic carbonate conglomerates associated with low angle detachments and inferred diapirs, and extensive deformation in deposits - especially in the Democratic Republic of Congo. Sediment hosted copper deposits form throughout the post-rift sequence, from early diagenesis (~800 Ma) through to late-stage metamorphism (490 Ma). Basin inversion between ~590-500 Ma produced an arcuate fold and thrust belt associated with regional heterogeneous metamorphism. This fold and thrust belt created structural controls for copper mineralization during late-stage metamorphism.

The Enterprise sediment-hosted nickel deposit (41Mt @ 1.07% Ni) is located within the western Domes region in the North-Western Province of Zambia. The deposit represents an apparent new style of hydrothermal nickel mineralization. Nickel sulfides are hosted in a sequence of quartz-, carbonate-, and carbon-rich metasedimentary rocks that interfinger with and overlie siliciclastic metasedimentary rocks of the Lower Roan Subgroup of the Katangan sequence. A low angle structural zone occupied by a polyolithic, probably halokinetic, breccia separates Lower Roan rocks from dolomitic siltstones of the overlying Mwashya Subgroup and diamictites of the Nguba Group. Lufilian deformation between 590 and 500 Ma produced low angle structures along the edges of the Upper Roan Subgroup and locally along the basement-Katanga contact. Associated metamorphism affected the entire sequence of rocks at Enterprise. Intense silicification and magnesian metasomatism occurred concurrently with regional metamorphic events and resulted in talc, chlorite, and kyanite alteration of the host rocks. Nickel sulfides precipitated in two main stages: a millerite (NiS)-vaesite (Ni<sub>2</sub>S)-pyrite assemblage in vuggy textured rocks that forms disseminations and semi-massive replacements; and later millerite-bravoite(Ni,Fe<sub>2</sub>S)-molybdenite assemblage that forms semi-massive replacements and occurs in quartz-kyanite veins. A discrete zone of copper sulfides underlies the nickel sulfide zones. Re-Os geochronology yields a 540.6 +/- 1.8 Ma age for mineralization at Enterprise, coeval with regional metamorphism. As will be discussed, the source of nickel at Enterprise is enigmatic.

# GSN FOUNDATION

## News from the GSN Foundation

Cami Prenn, Chair

We have a big announcement to make about a new scholarship fund that has been established!! It's the GSN – D.D. LaPointe Scholarship. It was established with a generous donation from D.D. LaPointe and Tom Irwin. It's been designed to encourage and support UNR students who intend to pursue a geological career in minerals exploration or development, economic geology, or related fields. It will be available to a UNR graduate student or an upperclassman undergraduate student intending to pursue those fields. The major field of study should be geological sciences, geological engineering, mining engineering, metallurgical engineering, hydrogeology or other related fields.

The GSN Foundation will review applications and make selections based on GPA and recommendations from professors or work supervisors. Students applying need to be GSN members too. We aren't quite ready to take applications yet but stay tuned for that announcement.

This fund is different than the UNR Scholarship donation GSN Foundation makes every year to UNR. That donation goes into the GSN Endowment Fund at the UNR Foundation that funds a scholarship every year to a student in the Mackay School of Earth Science and Engineering. That selection process is done by the UNR Foundation and is open only to undergraduates.

Many of you know that D.D. has dedicated the major portion of her career to education about geology and mineral extraction through her work with the Nevada Bureau of Mines and Geology, the Nevada Mining Association's Education Committee, the WAAIME scholarship committee, and the GSN Foundation. She conducts two annual workshops for teachers about geology and earth science through the NV Mining Association and invites those teachers to apply for GSN Foundation's K-12 field trips. It's an honor for the GSN Foundation to have D.D. and Tom establish this and entrust the Foundation to administer it. I can't think of anyone more appropriate for whom to name a scholarship.

We'd like to invite Companies, Organizations and individuals to also contribute to this scholarship fund. As the fund grows we'll be able to hand out more scholarships to students wanting to join our ranks in the exploration and mining industries! Checks can be made to the GSN Foundation with a note that it is to go to the GSN – D.D. LaPointe Scholarship.

*Thank you to our generous sponsor for the SO. NV Chapter's SEPTEMBER MEETING!*

**Geosyntec**  
consultants

engineers | scientists | innovators

*Thank you to our generous sponsor for the Elko Chapter's SEPTEMBER MEETING!*



*Thank you to our generous Sponsor for the Winnemucca SEPTEMBER MEETING!*



# *Thank you to our generous donors in September!*

## **G.S.N. FOUNDATION**

### **PLATINUM DONORS \$1,000+**

Jon Powell

### **GOLD DONORS \$500-\$999**

Ron Keickbusch

### **SILVER DONORS \$100-\$499**

Frank Fenne

Steve Green

Liang Hsu

Pamela Klessig

Dieter Krewedl

Scott Manske

Dan McCoy

Peter Olander

Debra Struhsacker

Eric Struhsacker

### **BRONZE DONORS \$1-\$99**

Fred Barnard

Keith Blair

Thomas Chapin

Odin Christensen

Kim Craig

Rachel Dolbier

William Durbin

David Fanning

Virginia Gillerman

Peter Hahn

Dean Heitt

Dustin Holcomb

Frank Howell

Raymond Irwin

Joe Kizis

Maureen Leshendok

Jay Olcott

Shea Clark Smith

## **G.S.N. Student Field Trip Fund**

Jeffrey Abbott

Tom Anderson

Harold Backer

Fred Barnard

Keith Blair

Ken Brook

Kel Buchanan

Rachel Dolbier

Steve Garwin

Boies Hall

Erin Hart  
Jim Hegelson  
Richard Hipsley  
Dustin Holcomb  
Elizabeth Hollingsworth  
Bert Jeffries  
Pamela Klessig  
Dieter Krewedl  
Brien Laird  
Daniel Laux  
Bob Loranger  
Patrick Loury  
Bob McCusker  
Marilyn Miller  
Jay Olcott  
David Poole  
Jon Powell  
Ken Raabe  
Richard Reid  
Shea Clark Smith  
Bill Stanley  
Debra Struhsacker  
Eric Struhsacker  
Mike Ward  
Steven Weiss  
Dana Willis  
Ted Wilton

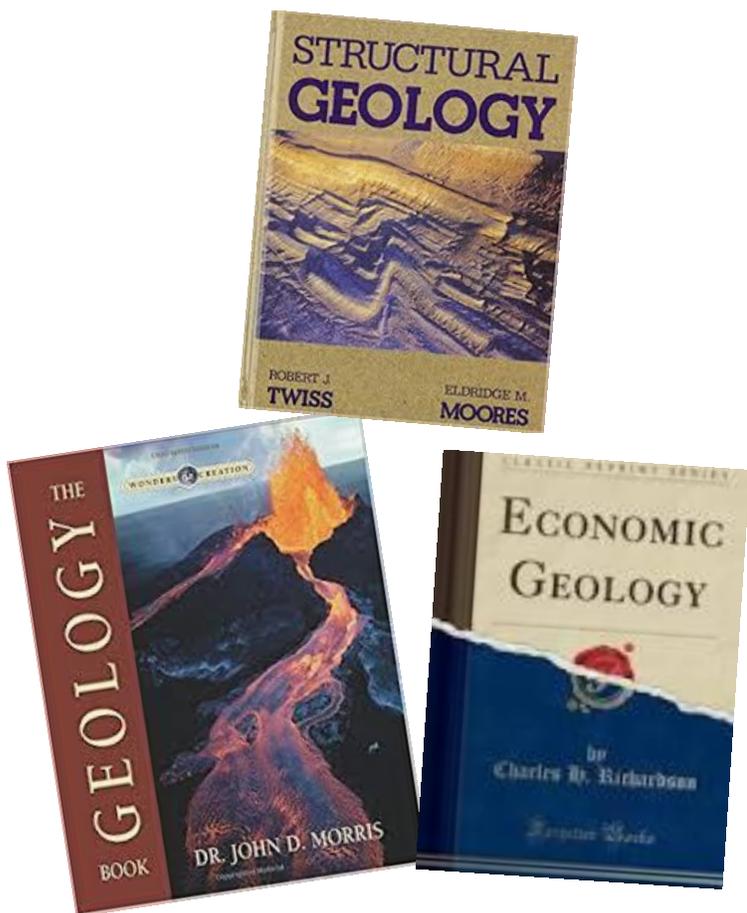
## **G.S.N. Student Dinner Fund**

Jeffrey Abbott  
Tom Anderson  
Sam Arentz  
Dylan Baldwin  
Fred Barnard  
Keith Blair  
Rachel Dolbier  
Dustin Holcomb  
Dieter Krewedl  
Dan McCoy  
Bob McCusker  
Marilyn Miller  
Dan Pace  
Bill Pennell  
Jon Powell  
Ken Raabe  
Richard Reid  
John Schaff  
Shea Clark Smith  
Debra Struhsacker  
Eric Struhsacker  
John Taylor  
Tommy Thompson  
Dana Willis  
Ted Wilton  
John Zimmerman

## Donate Your Geology Books and Get a Tax Deduction

It is that time of the year to consider gift giving. If you have any geologic books that you are considering giving away please contact Clancy Wendt. GSN and the Tucson Gem and Mineral Society have given over 80,000 books to Universities in Mexico. This is a tax deductible item and anything you have will be greatly appreciated as Mexican Universities have very little in the way of reference books. We are also seeking people who are going to Tucson who have room in the cars or trucks to take some of the books we already have.

Clancy's phone # is 775-852-2513.



# 2019 FY DUES DUE NOW!

2019 FY dues are now past due! If you would like to be in the GSN Directory please make sure all dues are paid by November 1, 2018. If your dues are not current by November 1, 2018 you will not be included in the annual directory. Please log on to <http://gsnv.org/membership/join-gsn.php> to pay your dues online or to download the paper form to mail it in. Let us know if you are sending it via mail so you don't get left out of the directory. If you have questions please contact Molly Hunsaker GSN Membership Chair at [mollymariehunsaker@gmail.com](mailto:mollymariehunsaker@gmail.com) or 775-340-0289.

[Click Here to Renew Online Right Now!](#)



## **Director, Mackay School of Earth Sciences and Engineering**

### **College of Science University of Nevada, Reno**

The University of Nevada, Reno is seeking a dynamic, innovative and creative leader to serve as the Director of the Mackay School of Earth Sciences and Engineering. The Mackay School is one of the world's leading educational institutions in the fields of natural resources, and earth sciences and engineering. The School includes the Departments of Geography, Geological Sciences & Engineering, and Mining & Metallurgical Engineering. Mackay also includes the Nevada Bureau of Mines & Geology, the Nevada Seismology Laboratory and the State Climate Office. The School awards undergraduate and graduate degrees across all disciplines in the earth sciences and engineering. Faculty members in the Mackay School also participate in two interdisciplinary graduate programs: Hydrologic Sciences; and Ecology, Evolution & Conservation Biology. In addition, the W.M. Keck Earth Science and Mineral Engineering Museum is housed in the Mackay School of Earth Sciences and Engineering.

The Director of the Mackay School reports to the Dean of the College of Science and is a member of the Dean's senior staff. The Director is responsible for leading and coordinating efforts in student and faculty recruitment and retention, developing student leaders and industry professionals, managing relations with industries and governmental agencies, building interdisciplinary efforts inside Mackay and across the University, and managing personnel and financial resources at the director's level. The Director will coordinate and lead fundraising efforts with the Development Directors in the College of Science.

The successful candidate will have an earned degree in the earth sciences or engineering, demonstrated leadership skills and administrative experience, experience in the natural resource industries, a commitment to diversity, and an understanding of the University of Nevada's land grant mission. Preference will be given to candidates with an advanced degree in the earth sciences or engineering, business or equivalent experience in the natural resource industries; a demonstrated understanding of natural resource industry related issues; demonstrated fundraising experience; and experience working with community members and university stakeholders.

Applications must include a resume, a statement of interest, and the names and addresses of five professional references. The preferred starting date is January 1, 2019. EEO/AA Women, under-represented groups, individuals with disabilities, and veterans are encouraged to apply. This posting closes at midnight October 27.

For more information and to apply, visit [https://nshe.wd1.myworkdayjobs.com/UNR-external/job/University-of-Nevada-Reno---Main-Campus/Director--Mackay-School-of-Earth-Science-and-Engineering\\_R0112213-1](https://nshe.wd1.myworkdayjobs.com/UNR-external/job/University-of-Nevada-Reno---Main-Campus/Director--Mackay-School-of-Earth-Science-and-Engineering_R0112213-1)

# NBMG Earth Science Week Field Trip 2018– Saturday, October 13–*SAVE THE DATE!*

NBMG Earth Science Week Field Trip 2018  
Location of Trip–Fallon Area  
*Details coming soon!*

We hope you can join us on **Saturday, October 13** as geoscientists from **Nevada Bureau of Mines and Geology** explain the geology of the **Fallon area** (volcanoes, earthquakes, and faults)–in celebration of Earth Science Week 2018 and the importance of earth sciences to the people of the state of Nevada.

NBMG coordinates annual geology field trips for the public during, or near, Earth Science Week. These field trips are fun, educational, family oriented, and always free. NBMG has been an active participant in Earth Science Week since it began in 1998.

**Details and signup for the October 13 trip will be coming soon!**



**Thank You!**

GSN Members, Brian and Jeanne Goss would like to thank all of the GSN Members at the Elko meeting last month who supported their children's fund-raiser!

## **AAPL** **AMERICA'S LANDMEN** Field Landman Seminar **ELKO, NV** Thursday, October 18th | 10:30AM

Schedule

10:30AM - 11:00AM

**Registration**

11:00AM - 12:00PM

Joshua Cook – Due Diligence on Mining Properties – How Much is too Much? – Risks, Red Flags and More

12:00PM - 1:00PM

**Hosted Lunch**

1:00PM - 2:00PM

Jay Dixon – Water Rights in Nevada – An Overview and Recent Changes

2:00PM - 3:00PM

Kirk Williams – Title Examination – Tips, Tricks and Tests 2018

3 CPL/RPL/RL  
RECERTIFICATION  
CREDITS

Registration Fee  
Members: Free  
Non-Members: \$60\*

\*COVERS YOUR  
MEMBERSHIP  
APPLICATION FEE AND  
DUES THROUGH  
JUNE 30<sup>th</sup>, 2019.

[Click Here to Register](#)



**Western  
Folklife Center**

501 Railroad Street  
Elko, Nevada  
89801

## ROCK TALK

### Outcrop exposure of Roberts Mountains Thrust, Roberts Mountains, Nevada

**Contributed by GSN Member, Stanley C. Finney**  
Secretary General, International Union of Geological Sciences  
Professor, Department of Geological Sciences  
California State University - Long Beach  
Long Beach, CA 90840  
[Stan.Finney@csulb.edu](mailto:Stan.Finney@csulb.edu)

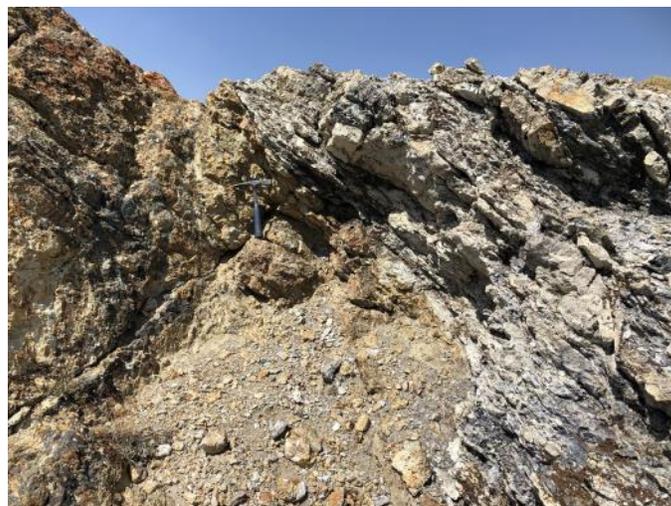
Merriam and Anderson (1942) defined and mapped the Roberts Mountains thrust as the contact between the Upper Devonian Devils Gate Limestone and overlying siliciclastic strata that they identified as the Ordovician Vinini Formation. Subsequently, Murphy et al. (1984) demonstrated that 1) the Devils Gate Limestone in the Roberts Mountains is unconformably overlain by the Mississippian, autochthonous to parautochthonous Webb Formation, which is composed of ribbon-bedded siltstone and beds of chert/quartz sandstone that were deposited in front of and subsequently overridden by the Roberts Mountains allochthon (RMA). The Webb Formation is, in turn, structurally overlain by Devonian siliciclastic strata which comprise the lowest thrust plate of the RMA. The Ordovician Vinini Formation comprises higher thrust plates in the RMA. Throughout the Roberts Mountains, the siliciclastic strata Devonian strata and underlying Webb Formation are deeply weathered, and the Roberts Mountains thrust - the structural contact between them - is mapped with difficulty on the basis of tiny chips that cover the ground surface. During field work in August 2018, I discovered that an outcrop high on the eastern slope of Roberts Creek Mountain at  $39^{\circ} 51' 04.44''$  N,  $116^{\circ} 16' 54.33''$ W exposes the Roberts Mountains thrust.

Merriam, C.W. , and Anderson, C.A., 1942, Reconnaissance survey of the Roberts Mountains, Nevada: Geological Society of America Bulletin, v. 53, p. 1675-1728.

Murphy, M.A., Power, J.D., and Johnson, J.G., 1984, Evidence for Late Devonian movement with the Roberts Mountains allochthon, Roberts Mountains, Nevada: Geology, v. 12, p. 20-23.



View to north of outcrop that exposes Roberts Mountains thrust. Vinini Creek - Roberts Creek road in distance.



View to north of Roberts Mountains thrust, rock hammer rests on Webb Formation; overlying, gray beds are Devonian strata at base of RMA.

## Activity Update

Mike Brady, August 2018

[www.activityupdate.com](http://www.activityupdate.com)

### NEVADA

Hecla Mining Co. announced that recent drill results at the Fire Creek Project include 59.8-60.96 meters @ 9.55 gpt Au, 10.2 gpt Ag (FCU-960); 75.43-76.2 meters @ 16.38 gpt Au, 6.8 gpt Ag (FCU-963); 47.24-49.31 meters @ 15.69 gpt Au, 6.8 gpt Ag (FCU-964) and 85.16-86.56 meters @ 4.77 gpt Au, 6.8 gpt Ag (FCU-965). (reserve = 256,400 tonnes @ 21.5 gpt Au, 20.5 gpt Ag proven+probable) *Press Release:* August 7

Hecla Mining Co. announced that recent drill results at the Midas Project include 57.6-61.26 meters @ 19.79 gpt Au, 2,293.5 gpt Ag (MUC-3063); 24.38-25.2 meters @ 15.01 gpt Au, 23.9 gpt Ag (MUC-3070); 25.45-27.43 meters @ 20.13 gpt Au, 23.9 gpt Ag (MUC-3075) and 66.75-67.66 meters @ 11.94 gpt Au, 675.8 gpt Ag (MUC-3080). (reserve = 119,100 tonnes @ 22.86 gpt Au, 218.4 gpt Ag proven+probable) *Press Release:* August 7

Hecla Mining Co. announced that recent drill results at the Hollister Project include 53.34-57.15 meters @ 16.04 gpt Au, 20.5 gpt Ag (HUC-02); 70.1-71.62 meters @ 6.82 gpt Au, 6.8 gpt Ag (HUC-03); 54.04-55.62 meters @ 17.06 gpt Au, 13.6 gpt Ag (HUC-05) and 229.51-139.29 meters @ 5.11 gpt Au, 3.4 gpt Ag (HUC-026). (reserve = 70,000 tonnes @ 19.45 gpt Au, 160.4 gpt Ag proven+probable) *Press Release:* August 7

Coeur Mining Inc. announced that it offered to acquire Northern Empire Resources Corp. though a 0.185 share Coeur/1.0 Share Northern Empire exchange basis valuing Northern Empire at \$90,000,000. (resource @ Sterling = 1,958,000 tonnes @ 3.61 gpt Au inferred open pit) *Press Release:* August 2

Maverix Metals Inc. announced that it acquired a 1.5% NSR on the McCoy-Cove Property from Premier Gold Mines Ltd. after Premier declined its right-of-first-refusal option. (resource = 900,000 tonnes @ 11.2 gpt Au indicated) *Press Release:* August 23

Nevada Zinc Corp. announced that based on recent drill results at the Lone Mountain Project, resources aggregate 3,257,000 tonnes @ 7.57% Zn, 0.7%

Pb inferred open pit. (no previous estimate) *Press Release:* July 25

Gold Standard Ventures Corp. announced that recent drill results at the Jasperoid Wash Project include 9.1-12.2 meters @ 0.46 gpt Au (JW18-25); 0-22.9 meters @ 0.76 gpt Au (JW18-26); 35.1-48.8 meters @ 0.33 gpt Au (JW18-27) and 1.5-39.6 meters @ 0.63 gpt Au (JW18-28). *Press Release:* July 26

Gold Standard Ventures Corp. announced that recent drill results at the Pinion Project include 71.0-106.1 meters @ 0.85 gpt Au (PC18-24); 67.6-152.4 meters @ 0.86 gpt Au (PC18-25); 31.4-43.6 meters @ 0.37 gpt Au (PC18-26) and 20.7-29.1 meters @ 0.66 gpt Au (PC18-27). (resource = 31,610,000 tonnes @ 0.62 gpt Au indicated) *Press Release:* August 21

Gold Standard Ventures Corp. announced that recent drill results at the Dark Star Project include 13.8-243.6 meters @ 2.08 gpt Au (DC18-07); 93.0-117.4 meters @ 0.38 gpt Au (DR18-100); 109.7-138.7 meters @ 0.26 gpt Au (DR18-101) and 99.1-111.3 meters @ 0.19 gpt Au (DR18-102). (resource = 15,380,000 tonnes @ 0.54 gpt Au indicated) *Press Release:* August 23

Nevada Copper Corp. announced that it would proceed with the underground development of the Pumpkin Hollow Project. (resource @ Eastern = 49,172,000 tonnes @ 1.39% Cu, 0.17 gpt Au measured+indicated) *Press Release:* August 28



**NMEC Announces the 2018 Nevada Mineral Exploration Summit**  
*(formerly our Annual General Meeting)*  
**Tuesday, October 9, 2018 - Atlantis Resort & Casino**

Fellow Explorer,

We are pleased to announce that registration and sponsorship opportunities are now available for the 2018 Mineral Exploration Summit.

**Regular Registration (September 16 - October 5)**

Current Member - \$125  
Non-Member - \$225 (comes with 2019 individual membership)

**Late/On-Site Registration (October 6 - 9)**

Current Member - \$175  
Non-Member - \$275 (comes with 2019 individual membership)

[REGISTER ONLINE](#)



**OTHER UPCOMING EVENTS**

**2 October: Arizona Geological Society:** Speaker: **Ihor A. Kunasz, Tru Group.** Title: **“The Geology and Economics of Lithium”**, Sheraton, 5151 E Grant Rd. (& Rosemont), Tucson AZ 85712. Please click on the link for more information and to RSVP: More information and online registration: [Ihor Kunasz Presents - The Geology and Economics of Lithium](#)

**4 October: NV Petroleum & Geothermal Society:** Speaker: Jim Faulds will be giving a talk titled, "Geothermal Journeys through New Zealand and Nevada: Similarities and Differences in Geothermal Activity between Magmatic and Non-Magmatic Rifts". Tamarack Junction, 13101 S. Virginia St., Reno, NV. Click on the link for more information and online registration: <https://s07.123signup.com/event/registration/hpkfp?mid=5044444>

**8 October: SME Northern Nevada Chapter Meeting,** Circus Circus Mandalay Room, Reno, NV. **Speaker: Gregory Couch, Author of The Bonanza King: John Mackay and the Battle Over the Greatest Riches in the American West”.** Click on the link to pay for dinner. <https://squareup.com/store/nnevsmc>. To RSVP by email: [NnevSME@gmail.com](mailto:NnevSME@gmail.com)

**9 October: NMEC (Nevada Mineral Exploration Coalition) 2018 Nevada Mineral Exploration Summit, Atlantis Resort & Casino, Reno, NV.** Contact Dave Shaddrick, [dshaddrick@aol.com](mailto:dshaddrick@aol.com) for more information. Register at <https://www.nvmec.org/2018summit>

**9 October: Nevada Water Resources Association:** 1-Day Tour of the Historic Marlette Water System—built in 1873 and still functioning. Washoe Valley, NV. Click here to register: <http://www.nvwra.org/2018-marlette-lake-tour>

**14-19 October: Soc. of Expl. Geophysics 2018 Annual Meeting in Anaheim, CA.** Discover the latest technological innovations in geophysics and network with more than 6,000 colleagues at the **geophysical** event of the year! Click here for more information or to Register: <https://seg.org/Annual-Meeting-2018/Attend>

**18 October: AEG—Great Basin Section: Speaker: Dr. Rich Koehler, NBMG.** Title: **“Active faulting in the North Valleys region of Reno, NV: A distributed zone within the northern Walker Lane”**, Sure Stay Plus, Best Western, 1981 Terminal, Reno NV. Please contact Merrily Graham for more information or to RSVP for dinner: [Merrily Graham <mkgraham75@gmail.com>](mailto:mkgraham75@gmail.com)

**4-7 November: Geological Society of America—130th Annual Conference.** We look forward to highlighting the Indiana area geology as well as the wider world of geoscience research at GSA 2018. Click here for more information and to Register: <https://community.geosociety.org/gsa2018/home>

# Big Sky Geophysics

Clark Jorgensen, M.Sc.  
Geophysicist

*Field Work  
Processing  
Interpretations*

P.O. Box 353 Phone/Fax +1 (406) 587-6330  
Bozeman, Montana 59771 Mobile +1 (406) 580-9718  
USA clark@bigskygeo.com

**For more details, my background, and case studies,  
Visit my webpage at [www.bigskygeo.com](http://www.bigskygeo.com)**



## Carlin Trend Mining Supplies & Service

369 - 5<sup>th</sup> Street, Elko, Nevada 89801  
775.778.0668 www.carlin-trend.com

Claim Staking - Soil Sampling - Land Research  
Core Cutting - Mine Hazard Fencing - Reclamation  
Project Management - Geological Consulting  
Geology & Drafting Supplies - AutoCad & GIS

Temporary Employees in All Fields  
Sister store located in Superior, Arizona  
Copper Triangle Mining Services 520-689-5200



*Serving Mining in Nevada Since 1992*

### General Engineering Contractor

**Drill Pads  
Road Building  
Reclamation  
Earthwork**

**Office: 775-753-5832  
Mobile: 775-778-1681  
Mobile: 775-934-1837  
[www.legarza.com](http://www.legarza.com)**

**NV License #35480  
CA License #804120**



## QUIT CHASING DATA!

One Location • Easy-to-Access • User friendly  
Searchable • Accurate



[www.TerraSourceSoftware.com](http://www.TerraSourceSoftware.com)  
[info@TerraSourceSoftware.com](mailto:info@TerraSourceSoftware.com)  
775.856.2913



Fire Assay, ICP-OES/MS,  
XRF, LECO, Custom Prep, BLEG

Chris Ioannakis, Managing Director, Analytical Services

#### Corporate Office

1500 Glendale Avenue  
Sparks, NV USA 89431-5902  
Telephone: (775) 356-0606  
Fax: (775) 356-1413

#### Elko Office

2320 Last Chance Road  
Elko, NV USA 89801-4852  
Telephone/Fax: (775) 738-9100

E-mail: [AALADMIN@aallabs.com](mailto:AALADMIN@aallabs.com)  
Website: [www.aallabs.com](http://www.aallabs.com)

## JBA WORKS, INC.

**Jo Beth Allen**  
Geologist

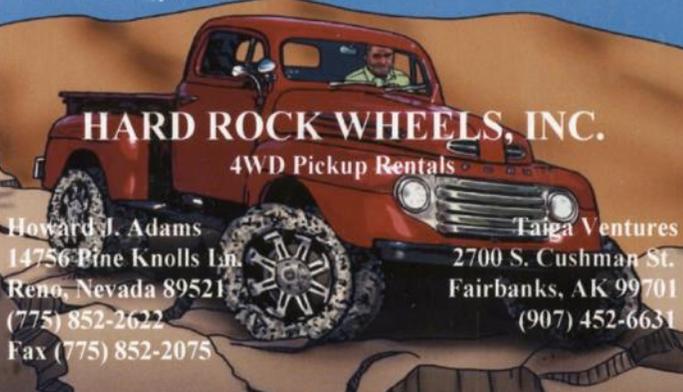
**GIS, Presentation Maps & Data Graphics**

GIS / CAD  
Slide & print Graphics / Illustrator & Photoshop

1055 Joshua Drive  
Reno, Nevada 89509

[jobethallen@sbcglobal.net](mailto:jobethallen@sbcglobal.net)  
Phone: 775-303-6818

[hardrockwheels@yahoo.com](mailto:hardrockwheels@yahoo.com)





Developing **GOLD** Assets in North America

TSX-V: ELY  
OTC: ELYGF

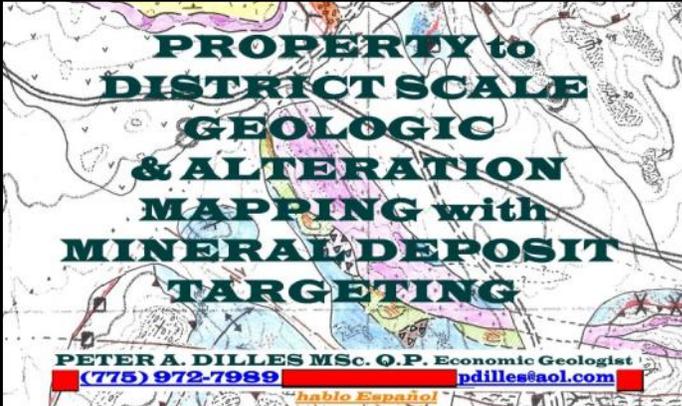
- LARGE NEVADA PROPERTY PORTFOLIO
- DRILL READY PROJECTS - FOR SALE or OPTION
- PROPERTIES PURCHASED
- ROYALTIES PURCHASED - PRODUCING or NOT

Trey Wasser - President & CEO  
(972) 803-3087 - office  
(940) 368-8337 - mobile  
trey@elygoldinc.com

Jerry Baughman - President, NSR  
office - (775) 853-1913  
mobile - (702) 592-6992  
jbaughman@elygoldinc.com

For Company & Property information go to:

[www.elygoldinc.com](http://www.elygoldinc.com)



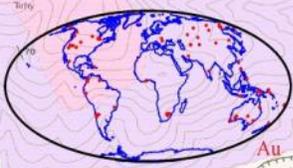
**PROPERTY to DISTRICT SCALE GEOLOGIC & ALTERATION MAPPING with MINERAL DEPOSIT TARGETING**

**PETER A. DILLES MSc. O.P. Economic Geologist**  
**(775) 972-7989** [pdilles@aol.com](mailto:pdilles@aol.com)  
*hablo Español*

**NEVADA EXPLORATION GIS DATA SETS**  
HIGHEST QUALITY

MINERAL OCCURRENCES  
GEOCHEMISTRY  
GEOLOGY  
GEOGRAPHY  
GEOPHYSICS  
CULTURE  
POLITICAL

website: [www.greatbasingis.com](http://www.greatbasingis.com)  
email: [jaravie@frontiernet.net](mailto:jaravie@frontiernet.net)  
phone: 775-777-8223






**MINERAL EXPLORATION SERVICES AND CONSULTING**

*We specialize in a full range of services including:*

- Claim Staking
- Exploration Project Management
- Contract and Consulting Geology
- Soil Sampling
- 2D and 3D GIS
- Drill Core Processing

**Call us at 775.340.2395 for a free estimate on your next project.**

**For more information on our services visit our website at [www.Rangefront.com](http://www.Rangefront.com)**



Right Solutions · Right Partner  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS & TERRACORE INTERNATIONAL**

- › Providing a one-stop shop for core services, spectral imaging and geochemistry.
- › Core Image Spectrometer™ available in ALS laboratories around the world.
- › Our facilities offer core cutting, core photography and full geochemical services.
- › Hyperspectral data interpreted via high-speed, semi-automated computer algorithms, constrained by style of mineralization or deposit type

Contact us to discuss solutions:

✉ [clientservicesusa@alsglobal.com](mailto:clientservicesusa@alsglobal.com)  
 🌐 [alsglobal.com/minerals](http://alsglobal.com/minerals)







## Bureau Veritas Minerals

Industry Leading Solutions for the Exploration & Mining Community

- Geochemical, Metallurgical & Mineralogical Services
- Laser Ablation, Core Logging Services & XRF
- Ore & High Grade Analysis
- Industry Leading Quality Assurance
- On-Site Services



+1 775 359 6311 | [bvmininfo@ca.bureauveritas.com](mailto:bvmininfo@ca.bureauveritas.com) | [www.bureauveritas.com/um](http://www.bureauveritas.com/um)

MINERALS

Drift Exploration Drilling, Inc., 6120 Pedroli Lane, Winnemucca, Nevada

FORAGE  
**ORBIT GARANT**  
DRILLING



For more information please contact Garth Patterson @403-601-4374 or [garth.patterson@telus.net](mailto:garth.patterson@telus.net)

# NORTH AMERICAN EXPLORATION

GEOLOGY • CLAIM STAKING • GEOCHEM SAMPLING • LANDWORK



**DAVID MORRIS**  
PRESIDENT • GEOLOGIST

895 N. MARSHALL WAY, SUITE A  
LAYTON, UT 84041

801.546.6453  
DMORRIS@NAE-XPLOATION.COM

## TOM CARPENTER

CONSULTING GEOPHYSICIST

5445 Goldenrod Drive  
Reno NV 89511  
(o) 775.849.9707  
(e) tcarpenter@gbis.com



Certified Reference Materials

OREAS gold CRMs are the most homogeneous available and provide unrivalled confidence in your assay data



North American Distributor:

Analytical Solutions Ltd  
www.explorationgeochem.com  
Tel: (+416) 462 9124  
Email: info@mail.explorationgeochem.com



### G.S.N. NEWSLETTER ADVERTISING RATES

Business Card Ads—\$50.00 month

1/4 Page Ads—\$150.00 month

1/2 Page Ads—\$300.00 month

Full Page Ads—\$450.00 month

10% Discount for running 10 ads (1 year)!

# GEOLOGICAL SOCIETY OF NEVADA



gsn@gsnv.org ● www.gsnv.org  
Telephone (775) 323-3500  
Fax (775) 323-3599  
2175 Raggio Parkway, Room 107  
Reno, NV 89512 USA

---

## TRAVELLING GSN BACKPACK PHOTOS

(submit your photos anytime and I'll place them when I have room!)

GSN Member, Elizabeth Zbinden submitted the photos below of her GSN 2010 Symposium backpack travelling the world at the Prime Meridian in Greenwich, England. She also took her backpack to the Burning Man Festival in the Black Rock Desert of Nevada last month. Many GSN members attend that event so I'm guessing hers wasn't the only one to see "the Man Burn"!

