



GEOLOGICAL SOCIETY OF NEVADA NEWSLETTER

Geological Society of Nevada, 2175 Raggio Parkway, Room 107, Reno, NV 89512
(775) 323-3500 - Hours Monday -- Friday, 9 a.m. to 4 p.m.
Website: www.gsnv.org • E-mail: gsn@gsnv.org



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Oct. 10, 2020

SATURDAY

Geological Society of Nevada (GSN) Fall 2020 Field Trip (One Day)
"Berlin-Ichthyosaur State Park and Buffalo Canyon:
Reduced Intrusion-Related Gold Deposit"

Details and link to register can be found on Page 8. Deadline 10/2/20!

Oct. 15, 2020

THURSDAY

VIA ZOOM!

ELKO CHAPTER & WINNEMUCCA CHAPTER JOINT ZOOM MEETING

The GSN Elko Chapter will be hosting their meeting via Zoom on October 15th at 7 p.m. Speaker: Nick Hillemeier, CREG Program alum will be giving a talk titled, "Controls on Epithermal Gold-Silver Mineralization and Alteration at the Gravel Creek Deposit, Elko County, Nevada". The abstract and Zoom meeting login credentials can be found on page 6. Please contact President Justin Milliard for more information: justin.b.milliard@gmail.com

Oct. 16, 2020

FRIDAY

VIA ZOOM!

GSN MEMBERSHIP ZOOM MEETING

The GSN's October meeting will be held via Zoom on October 16th beginning at 6:45 pm for chatting. Talk begins at 7:00 pm. **Speaker: Fred Holabird, SME.** Title, "Nome Offshore Gold Deposit May Represent the Future of Mining". Please contact Laura Ruud at the GSN office if you have questions: gsn@gsnv.org. See page 3 for abstract. Zoom meeting log-in info will be emailed the week prior to the meeting.

Date TBD

SO. NEVADA CHAPTER ZOOM MEETING

Speaker and Date To Be Announced. Please contact Chapter President, Joshua Bonde for more information: joshua.bonde@nvscicenter.org.

Oct. 29, 2020

THURSDAY

VIA ZOOM!

GSN SYMPOSIUM 2021 ZOOM LECTURE SERIES

Speaker: Tom Benson, Lithium Americas Corp.

Topic: Title: "The origin of the Thacker Pass lithium deposit, the largest known lithium resource in the United States"

Abstract on page 12.

Talk Date: October 29, 2020 @ 7:00 pm. Zoom Login Credentials on Page 7

YOUR GSN CHAPTER OFFICERS FOR 2020-2021!

Elko President—Justin Milliard

Elko Vice President—Zachary Palmer

Elko Secretary—Meredith Baker

Elko Treasurer—Aryn Hoge

Elko Membership Chair—Megan Wheatley

So NV President—Joshua Bonde

So NV Vice President—Simon Jowitt

So NV Secretary—Becky Humphrey

So NV Treasurer—Paul Bowen

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Winnemucca Treasurer—Andrew Smith

Winnemucca Membership Chair—JoAnn Newbury

FROM THE PRESIDENT
Mary Stollenwerk, GSN President 2020-2021
OCTOBER 2020



We have started the Monthly Membership Meetings with an excellent “Synthetic Silver Series” on market outlooks and more. The Chapters are also carrying on with Zoom meetings. It is our hope that GSN members from all over Nevada and beyond will be able participate. I want to keep things lively and encourage the good pre- and post chat sessions, as well as encourage questions and interaction with the speaker. This coming month we will have Fred Holabird’s talk about “Nome Offshore Gold Deposit May Represent the Future of Mining”.

- The Fall Field Trip is a GO! See page 8 to see what Vice President Patsy Moran has cooked up for us!
- The 2020 Symposium talk series will continue on the last Thursdays of the month. See page 7 and 12 for talk info.
- See pages 6 and 7 for updates on what the GSN chapters in Winnemucca, Las Vegas, and Elko are doing.

Musings on the phrases “a box of rocks” and “beauty is in the eye of the beholder” ... Why would anyone think a box of rocks is an unintelligent thing? It’s a beautiful thing!

“Hey Mary – when will you take these back out to the desert and set them free?”. That was a college roommate referring to the rock samples I just brought back from field camp. What? I cannot say I still have whatever specimens those were, but I was just not ready to part with them back then. They were my firsts!

Outside of my office building is a collection of some larger samples I have brought back from various GSN field trips. I make a point of collecting (at least) one large interesting rock each time, and I put it in a garden bed that, in my opinion, these rocks are the best part of. Some of you have helped me carry them down the mountain. I tend to like breccias, apparently – textures that indicate very high energy systems. The building’s maintenance group were considering an overhaul on that garden bed, and they actually said “we have to get rid of these rocks!”. At first, I was certain they just meant the ratty scoria landscape rock that was sparsely covering the bare spots, but NO - they meant all of MY contributions too! What?! When I expressed some dismay, they said “well, you will have to let us know which ones are the ones of interest”, and I detected some eye rolling. The Nerve! I guess I will be hauling them home if this garden overhaul comes to pass.

A colleague recently texted me a picture of the back of his truck filled with rocks. He was darn near gleeful as he had been the lucky inheritor of a retiring geologist’s lifetime collection from all over the world. Back home he catalogued his haul – VG from mines all over Alaska, cool epithermal boiling textures, weakly radioactive cobalt ore, massive sulfide, Oh MY! He is ordering new furniture to show it off.



Here in Reno, we are lucky to have the W.M. Keck Earth Science and Mineral Engineering Museum, Nevada’s oldest geology museum. It is on the UNR Campus in the Mackay Building, and admittance has been free since it opened. While it is physically closed due to Covid, the curator, Garrett Barmore, is still actively helping people with their research, and visiting with school groups virtually. He is also working on the museum’s collections, and to this end, is asking for donations, so pull out **your** boxes of rocks! He is currently looking for representation of modern mining ores in Nevada, as well as items related to the mining industry’s response to Covid 19 to document how it is navigating this pandemic. Email is the best way to reach him at gbarmore@unr.edu.

GSN Virtual Talk: Friday, October 16, 2020

at 7:00 PM Pacific Time

(Zoom meeting details will be emailed to all members prior to the event.)

Speaker: Fred Holabird, SME

Title: “Nome Offshore Gold Deposit May Represent the Future of Mining”

Abstract:

Offshore placer gold deposits at Nome, Alaska may represent a new frontier for future exploration and mining of previously unknown gold deposits. Operations in offshore marine mining have significant technological challenges; however, professional marine mining operators at Nome are using new techniques and technology to exploit this new world of marine mining.

At Nome, Placer Marine Mining Co. (PMMC) owns mineral rights to 16,579 acres of offshore gold leases, representing approximately 65% of the total offshore gold leases let to date by the State of Alaska. These properties range from depths of 25 feet to ~70 feet covering an area approximately three miles wide by ten miles long. Here, near shore gold leases and areas in the public domain are operated by small miners, such as those seen on “Bering Sea Gold.”

Prior leaseholder WestGold mined several small sections of the leases from 1987-1990 totaling about 550 acres using the BIMA bucket-line dredge. Created in Singapore in 1978-1979 to mine tin ore from the seas off Indonesia, the dredge was not constructed to withstand Alaska waters and broke down permanently after four seasons. Reports of recovered gold approximate 188,000 ounces.

Anglo Ashanti and WestGold spent approximately \$25 million evaluating portions of the property—with more than 3,500 drill holes—developing resources on approximately 22% of the entire property. Exploration efforts centered on understanding a complex geologic past involving transgressive and regressive erosional sequences emplaced over the top of a long-term eroding gold source. This, in turn, was covered subsequently by at least two periods of glaciation.

Several large blocks were chosen to further investigate geologic complexities and ore controls. More detailed exploration and development work inside these blocks helped bring understanding to ore controls and grades, delineating potentially minable sections. Development drilling delineated numerous high-grade zones with approximately 200,000 ounces of drill proven resource. It also indicated an immediate target of 1,000,000 ounces within the target zones and an on-property global target of 6 million ounces.

Marine mining at Nome can only take place when the ice shield is gone—approximately June 1 to November 15. During that period, the turbidity is very high and the crab and fish are not in this part of the Bering Sea. Normal environmental restrictions apply; however, permit time is short—less than one year. A small operation can be had for as little as \$8 million. The smallest current operator on these leases operates an underwater ROV mining device with an 18 inch piping system in 60 feet of water. This operation mines at a rate of about 20 cubic yards per hour over about three months and has consistently produced about \$5 million per year—about four times the best operator on the Bering Sea Gold program.

PMMC is seeking mining partners who understand bulk marine aggregate mining concepts with gold as a byproduct. This presentation will be the first time exploration data has been released publicly.

“FACES OF GSN”

Patsy Moran

My path to become an environmental geochemist was far from a direct route. I spent my late teens and early 20's exploring the United States and working various retail and sales jobs. I eventually decided to “settle down” in the San Francisco Bay Area where I worked as a receptionist at Bayside Record Distributors and took a few classes at College of Marin. I can say with no uncertainty that my Physical Geology teacher changed the trajectory of my life. He invited students to question everything and this teaching style really worked on me – I was hooked! I obtained my Associates Degree and transferred to Humboldt State University. At the time, I decided to pursue a Biology degree, which in retrospect was largely motivated by my desire to do something useful to protect the environment. I found the chemistry classes much more satisfying and ultimately graduated with my BS in Chemistry.

I have many fond memories of Northern California with Moonstone Beach being one of my favorite places, glow worms and banana slugs still hold a fond place in my heart, and the 30°F increase in temperature just an hour drive inland is a secret that should not be divulged. My perception of job prospects in Arcata at that time included: teaching, forestry, or going back to retail/sales/customer service. None of these options were appealing so I returned to the Bay Area. Soon after, I got my first environmental job working on the EPA Region 9 Superfund Technical Assessment and Response Team. I'm not a fan of the level of bureaucracy associated with Superfund projects but the training was exceptional, and it was a turning point since the job took me to my first mine site: a mercury mine near Paso Robles. I learned about remediation projects, enjoyed the work, and made decent money but was barely making ends meet due to the first dot com boom. I threw in the towel after realizing that it would be years before I could even afford a ramshackle home in the North Bay. By threw in the towel, I mean I applied for Graduate School and was accepted into the Chemistry and Geochemistry Program at Colorado School of Mines (CSM).

Attending CSM turned out to be one of the smartest career and life decisions I've made. I lived in some of the most beautiful places in Colorado (Golden Gate Canyon, Bailey, Vail, and Highlands Ranch wasn't bad), got more comfortable in the backcountry, and met the man of my dreams to name some high points. My love for environmental geochemistry and working for the mining industry was ignited at CSM. Since earning my PhD, I've been able to help with permitting new mines, restart old ones, and reclaim others. Many of these mines are in beautiful locations that make the technical work even better.

I took the plunge into independent consulting a few years ago and it's another decision without any regrets. We now live in Incline Village and have one of the most beautiful lakes in the world, and excellent skiing, just minutes away. I have enormous freedom, work on (cont. on page 5)

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

interesting projects, and make good money doing what I love. Mark and I now have two grandchildren (there's no such thing as a step-grandma), which adds a whole new dimension to this wonderful life.

I'll admit that I've been putting off writing my "Faces of GSN" since I'd rather have hot poker placed in my eyes than write about myself. Turns out, it wasn't so bad and it reminded me just how fortunate I am. Thank you!



Sampling an underground seep for geochemical characterization influent water. My client (in the foreground) called the sample collection device a modified beer bong.



Coronavirus shut down all the ski resorts, but we were still able to spend the Spring doing laps at Mt Rose and Diamond Peak.



Enjoying one of my favorite holidays with Mark and the grandkids. The dog is Logan, who is no longer with us except in spirit.

GSN Elko and Winnemucca Chapters Joint Zoom Meeting

By Justin Milliard, President 2020-2021

We are excited to announce that Mr. Nick Hillemeyer will be giving the second virtual presentation for the Winnemucca and Elko Chapters on his MS research at the Center for Research in Economic Geology at the University of Nevada, Reno.

Thursday, October 15, 2020 – 7:00 PM Pacific Time (US and Canada)

Controls on Epithermal Gold-Silver Mineralization and Alteration at the Gravel Creek Deposit, Elko County, Nevada

Abstract. Western Exploration's Gravel Creek project is a recently discovered Miocene low-sulfidation epithermal Au-Ag deposit in northern Elko County, Nevada. The deposit is primarily hosted by stratabound mineralization with intervals of high-grade veins within an Eocene ash flow tuff known as the Frost Creek volcanics. Mineralization is primarily controlled by the thickness and permeability of the Frost Creek as well as two major structural trends: north-northwest striking normal faults that dip steeply to the east and a more indiscreet set of northeast-trending, near vertical strike-slip structures. Alteration proximal to high-grade zones is quartz-sericite-pyrite grading out to intense silicification of the Paleozoic basement stratigraphy (Schoonover Sequence) below and strong smectite and illite bearing clay alteration of the overlying Eocene Mori Road Formation and the Miocene Jarbidge Rhyolite with illitic alteration extending to the surface on the hanging-wall of the north-northwest striking normal faults. Gold in high grade intervals occurs in chaotic quartz-sulfide breccias and banded quartz-sulfide veins as fine-grained high-silver electrum commonly enclosed in pyrite±marcasite and arsenopyrite overgrowths. Silver mineralization is associated with coarse pyrrargyrite, naumannite, and a selenium bearing phase of stephanite. Although mineralization is focused in the Eocene volcanic strata, significant portions of mineralization occur in the underlying Schoonover as well as within the overlying Jarbidge Rhyolite. Mineralization in the Schoonover is hosted as chaotic breccias like those found in the Frost Creek with fewer banded veins. Jarbidge Rhyolite mineralization is hosted as both high and low angle veins primarily in the hanging-wall of the major normal faults but situated along the pervasive N-E trending strike-slip structural corridor. Mineralization that occurs within the bulk of the deposit is located approximately 1,500 feet below the surface and extending down beyond 3,200 feet at the deepest core holes. The most striking feature throughout the deposit is the pervasive nature of marcasite throughout the majority of the mineralized zones. Surficial exposure of hydrothermal breccia veins within the Jarbidge Rhyolite is similar texturally, geochemically, and mineralogically to those that have been intercepted by drilling at depth. A distinct lack of true low-sulfidation epithermal textures (e.g. colloform-crustiform banded quartz, bladed-quartz after calcite, adularia, etc.) suggests that the system never experienced intense boiling events like those corresponding with bonanza grades at Fire Creek, Midas, or Hishikari but new evidence suggests the presence of a high-grade feeder vein masked by post-mineral fault movement along the north-northwest striking normal faults. Sulfur isotope data was collected from a suite of samples representing the different mineralization styles, hosts, and various spatial relationships for 29 samples. Marcasite and Pyrite samples returned an average $\delta^{34}\text{S}_{\text{VCDT}} (\text{‰})$ value of 9.5 ± 1.1 excluding two extreme outliers suggesting a homogenous source for sulfur throughout the entire system likely partially contributed by disseminated diagenetic sulfur within the Schoonover Sequence. Gravel Creek offers the unique opportunity to view a nearly one-kilometer vertical section of a Nevada low-sulfidation epithermal system from silicified ash fall tuffs at the surface representing the paleosurface at the time of mineralization to beneath the mineralized zone in three dimensions. Increasing understanding of the interplay between depth, host rock physical properties, host rock geochemistry, and mineralization at Gravel Creek may prove to have importance for further mineral exploration beneath the vast Jarbidge Rhyolite in northeastern Nevada as well as a greater understanding of the role permeable host rocks can have in forming stratiform ore zones in epithermal systems.

Time: Oct 15, 2020 7:00 PM Pacific Time (US and Canada)

Join Zoom Meeting

<https://us02web.zoom.us/j/87807491061?pwd=d1hDQVVIb0xJYi9UWjFuci9kQTJlUT09>

Meeting ID: 878 0749 1061

Passcode: GSNELKO

One tap mobile: +16699006833,,87807491061#,,,,,0#,,5629725# US (San Jose)

Dial by your location:

+1 669 900 6833 US (San Jose)

+1 253 215 8782 US (Tacoma)

Meeting ID: 878 0749 1061; Passcode: 5629725





GSN SOUTHERN NEVADA CHAPTER

The GSN Southern Nevada Chapter is still lining up their speaker and details for the October Zoom meeting. Please watch for the date, speaker and topic to be announced by email.

Thank you,

Josh Bonde, GSN Southern Nevada President
joshua.bonde@nvscicenter.org.



GSN SYMPOSIUM 2021 ZOOM SERIES

Speaker: Tom Benson, Lithium Americas

Talk Date: October 29, 2020 @ 7:00 pm

Talk Title: “The origin of the Thacker Pass lithium deposit, the largest known lithium resource in the United States”
(See abstract on page 12)

Join Zoom Meeting:

<https://us02web.zoom.us/j/84556506021?pwd=TFBKWlpWcVcwUzJoUDJnMmhSdEszd09>

Meeting ID: 845 5650 6021

Passcode: Lithium

GSN Symposium 2021 Call for Papers

With the May 2020 GSN Symposium being postponed until May 2021, GSN is looking to fill open talk slots and poster presentations. We are also looking for papers for the 2021 publication. Draft abstracts are due by November 15, 2020. Guidelines and the submission portal are at:

www.gsnsymposium.org/call-for-papers-3/submit-abstracts/

If you are already a presenter, you do not need to resubmit an abstract.



VISION FOR DISCOVERY
SYMPOSIUM 2020

To purchase the 2020 Symposium Proceedings or to learn more about the symposium, please visit our website

www.gsnsymposium.org

Questions? Please reach out to:

Mike Ressel

mike_ressel@outlook.com

Molly Hunsaker

mollymariehunsaker@gmail.com

Geological Society of Nevada (GSN) Fall 2020 Field Trip
Saturday October 10, 2020
Berlin-Ichthyosaur State Park and Buffalo Canyon
Reduced Intrusion-Related Gold Deposit
Patsy Moran, GSN VP & Field Trip Organizer

GSN is going to make the best of the covid-19 situation by having a truncated field trip to locations that don't require much driving. Josh Bonde (GSN Southern Nevada President) will lead the Berlin-Ichthyosaur State Park portion of the trip. After lunch, we'll head over to the nearby Buffalo Canyon Project to learn more about this Reduced Intrusion-Related Gold Deposit using a field guidebook created with the help of Dan Pace, Patrick Quillen, Christian Thomas, and others. We'll have a pre-meeting with relevant talks the evening before so we can make the most out of a quick but informative trip. Trip packets, including field guidebook, will be shipped to registered attendees by Monday October 5, 2020. **Cost will be \$50 for members and \$75 for non-members. Registration is now open on the GSN website. See link below. If you are paying with Check or Cash, you can use the form on page 10.**

Friday October 9, 2020 5:45 to 7:00 pm - Pre-Meeting Information Session and Speakers (Virtual)

Saturday, Oct. 10, 2020

10:00 am	- Begin Arriving at Berlin-Ichthyosaur State Park
11:00 am	- Fossil Room Open, GSN Led Tour
12:30 pm	- Berlin Townsite Tour and Sack Lunch Provided
2:00 pm	- Buffalo Canyon Project
5:00 pm	- End of GSN Field Trip
	- Camping and Happy Hour

CLICK HERE TO REGISTER ONLINE: <https://www.gsnv.org/field-trips/>

- IMPORTANT INFORMATION -

Camping at the State Park is available on a first-come first-served basis. The GSN Group will be camping mainly in the PICNIC AREA. Day-use/camping fees are included in the registration cost. Let us know if you are camping Friday, Saturday or both nights.

To minimize our risk of covid-19 transmission we request attendees do the following:

- Do not attend if you have known covid-19 exposure or feel sick
- Maintain social distancing of at least 6 feet apart and/or wear masks
- Provide your own transportation
 - Do not share objects



Berlin fossil building and townsite - photos credit Famartin

Thank you to our generous sponsors!



GSN Fall 2020 Field Trip Registration Form (Checks and Cash only)

Patsy Moran, GSN VP & Field Trip Organizer



Geological Society of Nevada (GSN) Fall 2020 Field Trip Saturday, October 10, 2020



"Berlin-Ichthyosaur State Park and Buffalo Canyon - Reduced Intrusion-Related Gold Deposit"

Friday October 9, 2020, 5:45 to 7:00 pm - Pre-Meeting Information Session and Speakers (Virtual)
Saturday, Oct. 10, 2020

10:00 am	- Begin Arriving at Berlin-Ichthyosaur State Park
11:00 am	- Fossil Room Open, GSN Led Tour
12:30 pm	- Berlin Townsite Tour and Sack Lunch Provided
2:00 pm	- Buffalo Canyon Project
5:00 pm	- End of GSN Field Trip
	- Camping and Happy Hour

- IMPORTANT INFORMATION -

Camping at the State Park is available on a first-come first-served basis. GSN cannot guarantee spots will be available but every effort will be made to accommodate campers. Day-use/camping fees are included in the registration cost.

To minimize our risk of covid-19 transmission we request attendees do the following:

Do not attend if you have known covid-19 exposure or feel sick

Maintain social distancing of at least 6 feet apart and/or wear masks

Provide your own transportation

Do not share objects

THANK YOU TO OUR GENEROUS SPONSORS!



Person to contact in case of Emergency:

Name: _____

Camp Buddy: _____

Phone: _____

Participant: _____

Company: _____

Address: _____

Cell # _____

Email: _____

REGISTRATION COST:

\$50 - GSN Member

\$75 - Non-GSN Member*

\$0 - GSN Student Member Helpers (limit 6)

*Non-members are encouraged to become members of the GSN in order to take advantage of the reduced Member Rates - Annual Dues are \$50/year.

Payments must be made by Friday, October 2, 2020
No refunds after Friday, October 2, 2020

Total amount included with this form: _____

Payment: ☐ Check # _____ ☐ Cash ☐ ☐ ☐ ☐

We ask you to register online if using a credit card for payment. GSN has phased out the manual machine!
<https://www.gsnv.org/field-trips/>

Return with payment to:

Geological Society of Nevada
2175 Raggio Parkway
Reno, NV 89512
Phone: (775) 323-3500; Fax: (775) 323-3599; E-mail: gsn@gsnv.org

GSN Membership Renewal Notice!

GSN Dues renewals were due September 30, 2020. If you haven't paid your dues yet you can still get in the Directory! Dues can be paid online by clicking this link and logging in to your account (see "My Account" under the Membership tab): <https://www.gsnv.org/my-account/>. Please note that you must click the PayPal button to pay but **you do NOT have to have a PayPal account.**

2021 DIRECTORY ADVERTISING SPACE NOW AVAILABLE!

Don't miss this opportunity to advertise your company or yourself in the GSN 2021 Membership Directory! Hundreds of GSN Members rely on this directory year-round to find contact information for colleagues, vendors, services, etc.

PRICES ARE THE SAME:

Business Card—\$50

1/4 Page Ad—\$150

1/2 Page Ad—\$300

Full Page Ad—\$450

(Online CC payment will be available on the GSN website soon!)



GSN Logoed Masks For Sale Now!
\$10 each + \$3 shipping



**These Stormtech Performance Face Masks have 3-layer protection with anti-bacterial filter built in. Flexible nose bridge, ultra-soft elasticized & adjustable ear loops, machine washable & reusable!
(Online ordering will be available on the GSN website soon!)**

Mining Activity Update

Mike Brady, August 2020

www.activityupdate.com

NEVADA

Premier Gold Mines Ltd. announced that it acquired an option to earn a 100% interest in the Gatchell Property from Waterton Global Resource Management Co. for \$33,000,000 cash and 13,800,000 shares over 3 years. *Press Release: August 10*

Fiore Gold Ltd. announced that recent drill results at the Pan Project include 56.4-68.6 meters @ 0.32 gpt Au (PR20-148); 61.0-88.4 meters @ 0.65 gpt Au (PR20-151); 65.5-73.2 meters @ 0.47 gpt Au (PR20-152) and 47.2-50.3 meters @ 0.40 gpt Au (PR20-154). (reserve = 16,748,000 tonnes @ 0.51 gpt Au proven+probable) *Press Release: August 12*

Coeur Mining Inc. announced that recent drill results at the Rochester Project include 0-30.48 meters @ 0.10 gpt Au, 20.5 gpt Ag (ROCC20-1003); 165.63-291.08 meters @ 0.31 gpt Au, 34.1 gpt Ag (ROCC20-1004); 466.34-483.59 meters @ 0.17 gpt Au, 37.5 gpt Ag (ROCC20-1007) and 357.5-438.45 meters @ 0.03 gpt Au, 34.1 gpt Ag (ROCC20-1008). (reserve = 219,618,000 tonnes @ 0.10 gpt Au, 15 gpt Ag proven+probable) *Press Release: August 11*

Silver One Resources Ltd. announced that based on recent studies at the Candelaria Project, the heap leach pads contain a resource of 22,184,000 tonnes @ 42.1 gpt Ag, 0.07 gpt Au indicated and 11,451,000 tonnes @ 41.8 gpt Ag, 0.10 gpt Au inferred. *Press Release: August 18*

Coeur Mining Inc. announced that recent drill results at the Crown Project include 192.02-263.65 meters @ 1.71 gpt Au (CH20-02); 248.41-292.61 meters @ 0.68 gpt Au (CH20-06); 164.59-262.13 meters @ 1.36 gpt Au (CH20-07) and 163.07-243.84 meters @ 1.02 gpt Au (CH20-08). *Press Release: August 11*

Coeur Mining Inc. announced that recent drill results at the Secret Pass Project include 233.17-254.51 meters @ 0.68 gpt Au (SP20-05); 175.26-196.6 meters @ 0.68 gpt Au (SP20-06); 77.72-85.34 meters @ 0.68 gpt Au (SP20-07) and 161.54-175.26 meters @ 0.68 gpt Au (SP20-08). (resource = 3,534,000 tonnes @ 1.65 gpt Au inferred) *Press Release: August 11*

Coeur Mining Inc. announced that recent drill results at the SNA Project include 24.38-28.95 meters @ 1.36 gpt Au (SNA19-037); 18.29-41.15 meters @ 0.68 gpt Au (SNA20-038); 10.67-18.29 meters @ 1.02 gpt Au (SNA20-042) and 48.77-60.96 meters @ 1.36 gpt Au (SNA20-043). (resource = 1,510,000 tonnes @ 1.61 gpt Au inferred) *Press Release: August 11*

Coeur Mining Inc. announced that recent drill results at the Sterling Project include 128.02-132.59 meters @ 2.05 gpt Au (STR20-01); 89.92-106.68 meters @ 0.34 gpt Au (STR20-04); 3.05-9.14 meters @ 1.71 gpt Au (STR20-011) and 178.31-294.13 meters @ 3.07 gpt Au (STR20-018). (open pit resource = 1,958,000 tonnes @ 3.61 gpt Au inferred) *Press Release: August 11*

Nomad Royalty Co. Ltd. announced that it offered to acquire Coral Gold Resources Ltd. through a 0.85 share + \$0.05 cash for each share of Coral Gold for a total value of \$45,800,000. *Press Release: August 24*

Newrange Gold Corp. announced that recent drill results at the Pamlico Project include 44.2-64.0 meters @ 0.41 gpt Au (P20-48); 44.2-51.8 meters @ 0.49 gpt Au (P20-50); 13.7-19.8 meters @ 1.09 gpt Au (P20-52) and 56.4-71.6 meters @ 1.19 gpt Au (P20-53). *Press Release: July 30*

BlueBird Battery Metals Inc. announced that it acquired an option to earn a 100% interest in the Baxter Springs Property from Liberty Gold Corp. for \$500,000 cash and 19.5% of its outstanding shares over 1 year. *Press Release: August 28*

Ely Gold Royalties Inc. announced that it acquired a 0.33% NSR on the Sleeper Property, a 1.0% NSR on the WR Property and a 1.0% NSR on the Monte Cristo Property from Ken Snyder for \$350,000 cash. *Press Release: August 11*

Bitterroot Resources Ltd. announced that it acquired an option to earn a 100% interest in the Coyote Sinter Property from Geological Services Inc. for \$375,000 cash, 300,000 shares over 5 years and \$125,000/year payments thereafter. *Press Release: July 29*

Elko Sun Mining Corp. announced that it acquired an option to earn a 51% interest in the Tuscarora Property from American Pacific Mining Corp. for \$200,000 cash and \$1,350,000 in exploration expenditures over 2 years. (resource = 1,186,000 tonnes @ 1.22 gpt Au inferred) *Press Release: August 4*

Corvus Gold Inc. announced that recent drill results at the Mother Lode Project include 183.58-203.61 meters @ 0.41 gpt Au (ML20-134CT); 341.25-363.44 meters @ 2.11 gpt Au (ML20-141CT); 351.28-368.35 meters @ 2.05 gpt Au (ML20-142CT) and 321.44-355.93 meters @ 2.01 gpt Au (ML20-143CT). (resource = 13,226,000 tonnes @ 1.72 gpt Au measured+indicated) *Press Release: August 18*

The origin of the Thacker Pass lithium deposit, the largest known lithium resource in the United States

Dr. Thomas R. Benson

Lead Global Exploration Geologist, Lithium Americas Corporation

The Thacker Pass lithium deposit in Humboldt County, Nevada is the largest known lithium resource in the United States and the largest known and highest-grade sedimentary (clay) resource in the world (8.3 Mt LCE; Ehsani et al., 2018). The deposit occurs as a thick (up to 1 km) package of sedimentary strata deposited within the cauldron of the 16.3 Ma McDermitt Caldera in northern Nevada. The presence of elevated Li (up to ~9,000 ppm Li) within the caldera lake sediments of the McDermitt Caldera has been known since the late 1970's, though whether the deposit formed via hydrothermal or diagenetic processes is still debated (Rytuba and Glanzman, 1979; Morissette, 2012; Benson et al., 2017; Castor and Henry, 2020). This talk presents a new model for the genesis of the Thacker Pass deposit based on work done in collaboration with researchers at the University of Nevada-Reno (Ingraffia et al., 2020) and new research by Lithium Americas Corporation on the physical volcanology, sedimentology, and trace element geochemistry of the deposit. This updated model suggests that there are two main sources of Li for the Thacker Pass deposit. Source 1: leaching of outflow Li-enriched tuff by meteoric water and deposition in the caldera basin; and Source 2: prolonged degassing and devitrification of the thick underlying rheomorphosed intracaldera McDermitt (Long Ridge) Tuff. Leaching of rhyolitic tuff via meteoric water as the Li source (Source 1) is a phenomenon observed in other Li clay deposits located in southern Nevada, though these deposits are significantly lower in size and grade than the Thacker Pass deposit (e.g., the 1.3 Mt LCE resource averaging ~1,600 ppm at the Rhyolite Ridge deposit). The additional source of Li that makes Thacker Pass uniquely enriched in Li and voluminous (8.3 Mt LCE averaging ~2,900 ppm) is Source 2, the devitrification of the thick (> 1 km) rheomorphosed lithium-rich intracaldera tuff underlying the caldera lake sediments. Fumarolic degassing of this tuff resulted in the release of a considerable mass of Li and other metals (Cs, Rb, Mo) and ligands (S, Cl) from the tuff into a shallow lacustrine environment at the caldera floor. The Li mobilized from this process, in aggregate with the Li from Source 1, became incorporated in the structure of authigenic clays forming at the bottom of the caldera lake. As sediments accumulated within the basin, diagenetic alteration of the clays and minor hydrothermal systems likely overprinted the original sediment mineralogy and remobilized the Li into different sedimentary layers and structural sites within clay minerals. Because the caldera crater served as a closed hydrologic basin during degassing, sediment deposition, diagenesis, alteration, and weathering, the large mass of Li added to the system from both sources was unable to escape the McDermitt Caldera margins and remains in the sediments to the present day.

Tom Benson Bio:

Tom Benson is the Lead Global Exploration Geologist at Lithium Americas Corporation. He received his Ph.D. in volcanology from Stanford University in 2017 for his research on global lithium resources associated with large caldera-forming eruptions. His research has gained international acclaim, appearing in Nature, The Smithsonian, NPR, and Wired, among other media outlets. Before this, Dr. Benson researched geothermal systems as an undergraduate at Harvard University, Research Associate at the Massachusetts Institute of Technology, and Fulbright Scholar in Iceland. Before joining Lithium Americas Corporation full-time in 2018, Dr. Benson worked as Adjunct Assistant Professor at New York University, Research Associate at the American Museum of Natural History, Visiting Scholar at Columbia University, and Consulting Geologist for Lithium Americas Corporation. As Lead Global Exploration Geologist at Lithium Americas, Dr. Benson leads exploration efforts across the world and helps guide exploration programs at the Cauchari-Olaroz and Thacker Pass projects. He also is actively engaged in peer-reviewed research on the origins of sedimentary and brine lithium deposits.



Congratulations to GSN Member Catherine Clark! She received the "Distinguished Alumni" award from the University of Nevada, Reno in recognition for achievements in her field!



Catherine Clark '96 M.S.
(resource management)

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Catherine received her bachelor's degree in geography from California State University, Northridge and completed her master's degree in resource management at Nevada. Catherine's career in the environmental field includes working for various government agencies, environmental consulting and for a mining and mineral processing development company, Lithium Nevada. Catherine has been with Lithium Nevada for more than nine years and serves as environmental director. She enjoys boating at Lake Tahoe and hiking throughout the Sierra. She has been married to her husband, Brian, for 32 years.



Great Basin Rendezvous 2020 Wrap-Up

By JoAnn Newbury

A group of cabin-fevered camping enthusiasts gathered at the Royal Peacock Opal Mine for the 8th annual Great Basin Rendezvous September 11-13. We enjoyed good weather, improved air quality (15 versus Reno at 156), some digging and much-needed camaraderie.

Geologist John Churchill had the best find, a limb which came out of the wall in pieces, one of which contained black opal. Julie Eaklor from Pilot Gold found a nice twig surrounding a mocha-colored opal while sifting through the tailings.

None of us came back any thinner. Friday night's meal, sponsored by National Gold, featured grilled Cornish game hens and rice pilaf; Saturday night we dined on prime rib and twice baked potatoes courtesy of Envirotech Drilling. Both meals were followed by homemade desserts and fresh-churned ice cream. Dinners were prepared by mine owner Julie Wilson and her staff. Catherine Lee of EM Strategies, along with helpers Christine Ballard and Elizabeth Zbinden, kick-started our Saturday and Sunday with breakfast provided on Saturday by Falcon Drilling and by EM Strategies on Sunday.

"Big Jim" Hutchins, a volunteer at the mine, gave a great PowerPoint presentation on opals after dinner on Saturday night. Julie surprised us with live music around the campfire on Saturday night provided by friend John Witzel playing guitar and singing.

NMEC would like to sincerely thank our other sponsors for their support: Boart Longyear, Drift Exploration, Magee Geophysical Services, TonaTec Exploration, Chris Henry and Elizabeth Zbinden. We couldn't have Rendezvous without you!



Clockwise from top left: Catherine Lee, Christine Ballard and Elizabeth Zbinden cooking breakfast; Hayden Smith, Clark Smith, Warren Thompson & John Churchill; opalized branch found by John C.; John C. and his prize find; Mateo, JoAnn N. & Steve Neilsen (sponsor); Clark S., Christine & Allen B. digging in the tailings piles; Dave & Sandy Shaddrick. (Photos by Laura Ruud)

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 70,000 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. 775-852-2513.

Our friends at DREGS are inviting GSN Members to join their Zoom meeting on Monday, October 5th!



Denver Region Exploration Geologists' Society

This month's meeting: October 5, 2020

Virtual Presentation Zoom Link:

<https://zoom.us/j/3688010347?pwd=TnRMV2M4U2ZqdEk2WjVaMDk3dThFUT09>

Setup: 6:45 p.m. and Presentation begins at 7:00 p.m.

DREGS 2020 DISTINGUISHED LECTURE

Jon P. Thorson, Consulting Geologist

Title: "BASIN GOLD; EXPLORATION IMPLICATIONS OF PRECIOUS METALS IN HIGH-CHLORIDE BRINES"

Precious metals (Au, Pt, Pd) occur at ore- or byproduct-grade concentrations in several types of ore deposits that are characterized by deposition from highly concentrated chloride brines at relatively low temperatures. These factors are consistent with the generation of the brines and metal contents by diagenetic process in sedimentary basins. The Kupferschiefer "copper-shale" deposits in Germany and Poland may contain up to 200 ppm Au, 350 ppm Pt, and 100 ppm Pd (Kucha, 1982, 1993). The bleached, altered sandstone footwall of the Kupferschiefer disseminated copper mineralization in the Lubin-Sieroszowice district, Poland, contain a thin horizon that ranges in grade from 0.5 grams/ton (g/t) Au to 100 g/t Au and averages 1.5 g/t Au, 0.2 g/t Pt, and 0.3 g/t Pd over large areas (Piestrzynski and Wodzicki, 2000). Gold and PGE have been reported from other sandstone-hosted copper deposits, similar to the Kupferschiefer, from Russia, China, Africa, and South America. Gold and PGE have also been reported from unconformity-related uranium deposits in Canada and Australia (Wilde, et al., 1989; Mernagh, et al., 1994). Some moderate-size SEDEX Zn-Pb-Ba deposits (Rammelsberg, Germany; Anvil District, Yukon, Canada; and Triumph, Idaho, USA) contain Au in the 0.5 to 2.2 grams/ton range (Emsbo, 2000). All of these deposits are characterized by basinal occurrence, relatively low temperatures of formation (100 to 200°C) and high-chloride brine ore-fluids. These deposits stand as a pragmatic testament that the chemistry of low temperature brine transport of Au and PGE may work on a large scale, and in many basins.

Under oxidized conditions, gold has been demonstrated to be soluble in high-chloride solutions at ambient surface temperatures in low temperature experiments (Emmons, 1917; Cloke and Kelly, 1964; Lakin, et al., 1974) and occurs in supergene environments (Butt, 1989; Smyth and Button, 1989). Under reduced conditions, moderate temperature acidic brine containing H₂S (15 wt% NaCl equiv, pH 5.5, 200°C) is capable of transporting as much as 1 ppm Au in solution (Emsbo, 2000). There has been relatively less investigation of the behavior of PGE in low temperature environments and chloride-rich brines, however Wilde, et al. (2003) concluded that the behavior of PGE are much like that of Au.

During middle to late diagenesis in sedimentary basins, large volumes of water are liberated by dehydration mineral reactions in argillaceous sediments, under similar pressure and temperature conditions that control the generation of petroleum. These resulting diagenetic fluids are acidic at moderate temperatures (80 to 160°C) from high concentrations of organic acids (Surdam, et al., 1984, 1989). In basins containing evaporites, the connate brine will contain high chloride content left from evaporative concentration of sea water. The net effect in salt-bearing petroleum basins is naturally occurring dense chloride brines with pH ranges from 7 to 3.

The combined pragmatic occurrence data, chemical data, and diagenetic fluid-liberating reactions suggest a class of relatively under-explored precious metals deposits associated with clastic-dominated evaporite basins. Exploration for such deposits using a systems approach suggests that we should evaluate (1) basin style and history, (2) metals source rock, (3) methods of expelling dense brines, (4) brine flow-paths, and (5) metal concentrating mechanisms.

Please Visit the DREGS web site at <http://www.dregs.org> for up-to-date information on meetings; membership applications; abstracts of technical presentations since 1997; and more.

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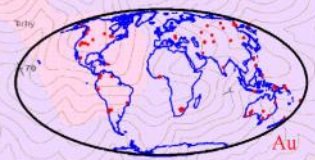
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