**GSN NEWSLETTER** 

#### March 2000, Vol. 14, No. 3

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# **CALENDAR OF EVENTS**

Mar 3 & 17 SYMPOSIUM 2000: Organizational meeting at 12:00 noon - Watts Room, University Inn, UNR. Cheri Reimann, 775/358-4336. Mar 17 GSN MEMBERSHIP MEETING: At Elks Club, Reno, NV; Speaker - Richard K. Larsen, Geology of Newly Discovered Gold Deposits at the Florida Canyon Mine, Pershing County, Nevada. Meeting details, page 3. Mar 23 GSN ELKO CHAPTER: At the High Desert Inn, Elko, NV; Speaker - Lewis Teal, Newmont Gold Corp., Geologic Overview of the Yanacocha District High-Sulfidation Gold Deposits, Northern Peru. Social-6:30, talk-7:00. Reservations not required. Call Jeff Pontius at 775/778-9280 for information. GSN SOUTHERN NEVADA CHAPTER; Lily Fong Geoscience Bldg, UNLV; Paul Mar 30 Bowen, R.P. Bowen Engineering, Inc., Exploration for a VMS Gold Deposit. Call K. Goebel, 702/263-7600, or Jean Cline, 702/895-1091 for information. GSN MEMBERSHIP MEETING: At Elks Club, Reno, NV; Speaker - Tommy Thompson Apr 21 and UNR Students: Marcus Johnston and Lori Clarke. Details in April Newsletter. May 15-18 GSN Symposium, Geology and Ore Deposits 2000: The Great Basin and Beyond. Registration materials now available on our web site, www.gsnv.org GSN Newsletter is published monthly except June and July Geological Society of Nevada, PO Box 12021, Reno, NV 89510-2021 USA, 775/323-3500

### **PRESIDENT'S MESSAGE**

Joseph Anthony Kizis, Jr., GSN President 1999-2000

The GSN has been very active since my last President's message. Most noticeable has been the enormous effort of the Symposium 2000 Committee. So many of you have donated so much of your valuable time, and it shows. There is a great lineup of talks, poster sessions, field trips and short courses. Exhibitors will have lots of information about their services, and great entertainment is planned. Symposium 2000 should be fun, as well as highly educational. Where else can you find as much descriptive geology of ore deposits?

We have now modified the Newsletter so that it is much easier to receive via email. Much thanks to you patient members who first signed up. The rest of you please consider giving email delivery a try... it's convenient, and it helps us keep our costs down. Just give the GSN office a call to set it up, 775/323-3500, or e-mail at gsn@mines.unr.edu

Last October, the GSN's Executive Committee voted to set up the **GSN Foundation** in order to provide funding for the GSN's various philanthropic activities. The **GSN Foundation** is now an official Nevada corporation, and we are only awaiting an IRS ruling to begin tax-deductible fundraising activities. The Executive Committee has given quite a lot of thought into setting up the Foundation, and we have solicited input from various members. The result is published in this Newsletter as the Foundation's Mission Statement and Operating Guidelines. The Nominating Committee is currently evaluating possible nominees to the Foundation's Board of Directors, so please contact me if you would like to serve.

Thanks to American Assay Laboratories and CGS, Inc. for hosting the February Meeting



#### THE GSN FOUNDATION—MISSION STATEMENT & GUIDELINES

The mission of the GSN Foundation is to provide funding for the Geological Society of Nevada's philanthropic contributions.

Operating Guidelines: 1) The Foundation will accept donations of cash and marketable securities. Other types of donations will be accepted only if approved by the Foundation's Board of Directors (approval via mail, email, or meeting). The Foundation will not assist in determining the value of any donation. 2) The Foundation will accept both nonrestricted donations and restricted donations, with non-restricted donations being preferred. Restricted donations are those designated by the donor to be applied in a specified manner or to a specified cause already approved by the Foundation. Any restricted donations designated for a new cause must be preapproved by the GSN Executive Committee and the Foundation's Board of Directors (approval via mail, email, or meeting). 3) Non-restricted funds raised by the Foundation will be distributed in the following manner: 1st priority, UNR scholarship - \$2,000 maximum; 2nd priority, School field trips -\$5,000 maximum; 3rd priority, UNLV scholarship - \$1,500 maximum = \$8,500. 4) Should non-restricted funds be insufficient to cover all three of the above causes, funding will be distributed based on the order of priority. 5) Should non-restricted funds exist in excess of the maximums for the three causes listed above, more than one half (1/2) of that excess will be placed into Reserve and less than one half (1/2) will be distributed to the charities below. The GSN Executive Committee will determine the exact proportion of any such distribution: UNR DeLaMare Library - \$1,000 maximum, NBMG Mapping Grants - \$3,000 maximum. 6) The Reserve funds will be invested as directed by the Foundation's Board of Directors, with advice from the GSN's Financial Subcommittee. The Reserve fund's investment income will be available to fund the above causes. The principal will remain in the reserve fund as long as the Foundation exists. 7) Non-restricted funding levels cannot be raised for the above causes, and new causes cannot be added using non-restricted funds, until the Reserve

fund is sufficient to provide annual investment income equal to 100% of the above funding levels. 8) The Foundation's Board of Directors will be responsible for determining any increase in funding levels and for determining any new causes to be funded. Requests for an increase in funding and adding any new causes must be based on recommendations presented to the Foundation in writing by the GSN Executive Committee. 9) The Foundation's Board of Directors should be composed of a cross section of the GSN's general membership as much as possible. Directors must be members of the GSN. Directors will meet at least guarterly and will conduct at least one fund-raising event annually. 10) Directors will be elected each year by the GSN membership; however, Directors will be encouraged to serve multiple terms to provide continuity in the Foundation's programs. The nomination and election processes will mirror those of the GSN. The GSN's Nominating Committee will choose proposed Directors to be presented for election to the general membership of the GSN. 11) There will be ten (10) Directors. Four Directors will be the GSN's current President, Vice President, Treasurer, and Secretary, and they will serve as those officers of the GSN Foundation. Six additional Directors will be elected from the GSN's general membership, and they will serve as the Fund-raising Committee for the Foundation.

#### **GOLF ALERT**

The Annual GSN Golf Tournament, sponsored by **Eklund Drilling Company**, is scheduled for June 10th, at 1:00 PM. The Tournament will take place at the Sierra Sage Golf Course, north of Reno. Look for additional information and sign-up forms in upcoming newsletters.

### **SCIENCE FAIR JUDGES**

Elizabeth Jones, GSN Education Co-Chairperson

If you're receiving this Newsletter via E-mail, you still have time to sign-up to serve as a judge at the Western Regional Science Fair. For more information, contact **Liz Jones** at 775/846-7901 or aej@povertypeak.reno.nv.us

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# GSN March 17, 2000 Membership Meeting

| Date:<br>Time:<br>Cost:<br>Reservations: | Friday, March 17, 2000<br>Social-6:00, Dinner-7:00, Meeting-8:00<br>\$17.00 (dinner)<br>phn 775/323-3500; fax 323-3599<br>or e-mail: asp@mines.unr.edu | Location:<br>Directions: | Elks Lodge, 597 Kumle Lane, Reno, Nevada<br>Across (W) from the Reno-Sparks Convention<br>Center (S Virginia St), located just behind the<br>Les Schwab Tire Center<br>Bichard K Larsen, Elorida Canvon Mining, Inc. |
|--|--|--------------------------|--|
| Deadline:                                | Reserve by noon Wednesday, March 15  | Speakers/topic.          | See abstract below.  |

#### Bar Hosted by Mine Development Associates and Florin Analytical Services/Kappes Cassiday & Associates

#### GEOLOGY OF NEWLY DISCOVERED GOLD DEPOSITS AT THE FLORIDA CANYON MINE, PERSHING COUNTY, NEVADA

Richard K. Larsen, Florida Canyon Mining, Inc.

The Florida Canyon Mine is an open pit, heap leach gold mine located adjacent to I-80 at the northwest corner of the Humboldt Range, Pershing County, Nevada. The Humboldt Mining District was organized in 1860 when placer gold was discovered, and small amounts of gold, silver, mercury, tungsten, fluorite, kaolin, and sulfur were produced from various small mines throughout the district. The Standard Mine, located five miles south of Florida Canyon, was the most productive historic operation and yielded about one million dollars in gold and silver during periods of production just before and after World War 2.

A modern era of exploration began in 1969 with drilling campaigns by Homestake, Cordex and Asarco. In 1983 Pegasus Gold Corp. geologists began an exploration drilling program and by 1985 plans for mining were being made (Heatings et al. 1099). Construction of

(Hastings, et al., 1988). Construction of a heap leach facility began in 1986, and production has been continuous since then with over 1,260,000 ounces of gold recovered. Year end reserves for 1998 were 650,000 ounces with additional mineralization and mineralized material adding 2,400,000 ounces. Approximately ten million tons per year of ore is crushed and placed on the heaps by a radial stacker along with a nearly equal amount of truck-dumped run of mine. Yearly production averages 150,000 ounces of gold.

Mineralization at Florida Canyon consists of numerous lenticular bodies of silicified silty argillite in the lower portion of the Triassic Grass Valley Formation. These irregular, interfingering deposits comprise gold bearing quartz stockworks cutting structurally prepared but unreactive host rock and consist of micron size gold associated with quartz. Argillic alteration locally accompanies silicification, and there is widespread oxidation of iron minerals to hematite.



Plans to begin self mining in 1996 made delineation of increased mine site reserves and discovery of new deposits a priority. An "inside-out" exploration strategy was implemented in which criteria from a district mineralization model would be systematically applied from the mine site outward in order to identify new exploration targets. An opportunity to map at the mine site and participate in ongoing development drilling assisted in gaining expertise with the deposit.

#### ABSTRACT (continued from page 3)

The model developed with the help of other FCMI geologists attempts to characterize Florida Canyon mineralization through the following four criteria: 1) influence of sedimentary features of the host silty argillite on deposit shape, 2) structural preparation of host rock and development of conduits for fluid movement, 3) introduction and precipitation of gold-bearing quartz mineralization, and 4) alteration associated with mineralization.

The silty argillite host units are part of a sedimentary sequence deposited in a deltaic environment (Silberling and Wallace, 1969) formed at a hinge zone separating a shelf to the east from a basin to the west (Elison and Speed, 1988). Mapped sedimentary features consistent with this environment include current bedding, graded bedding, and cross stratification. Increased permeability related to these features appears to have favored the introduction of mineralizing fluids, and is believed to be responsible for the lenticular, sinuous configuration of the ore deposits.

Florida Canyon lies along a belt of Mesozoic regional deformation known as the Fencemaker Thrust. Compression along this belt caused the Triassic depositional basin to the west to collapse, with deep water units being thrust eastward. During this event large and small scale folding was developed along with west-dipping low angle structure (Elison and Speed, 1989). Subsequent right lateral wrench faulting developed northeast-trending shear zones and fault zones later cut by northwest-trending structures and Basin and Range extensional faulting. The combination of these structural elements appear to have formed conduits for hydrothermal fluids and sites for precipitation of gold-bearing silicification in favorable host stratigraphy.

Exploration for new targets began with a soil geochemistry grid on 200 foot centers over a three square mile area north, east, and south of the mine site. Geologic mapping at a 1 to 6,000 scale was also completed. Gold anomalies exceeding 100 ppb defined five targets and mapping identified previously unrecognized zones of intersecting structure, strong argillic alteration, and quartz veining. The Radio Tower East anomaly, located over 5,000 feet east of existing mine workings, was especially strong with over 200 ppb gold in soil over an area 1,600 feet long by 500 feet wide. Alignment of three target areas including Radio Tower East along a N40E trend was considered favorable since that orientation exactly parallels structure at the known Madre and Northeast Extension deposits to the west.

A "back of envelope" estimate suggested a potential for discovery of over 600,000 ounces at these targets and support for a first phase drilling campaign in 1996 was gained. Angle RVC drilling with a due east bearing was used since this orientation would cut all structural trends and penetrate the northwest dipping stratigraphy at a near normal angle. The third hole drilled at Radio Tower East penetrated 100 feet @ 0.066 opt Au starting at the surface and is considered the deposit discovery hole.

Follow up fence drilling during 1997 at Radio Tower East confirmed the discovery of a layered ore deposit with similar characteristics to the main mining areas and an extension of the deposit to the northeast named Headwaters was recognized. Also discovered was near surface gold mineralization at Jasperoid Hill, southwest of Radio Tower East, and at Radio Tower West which lies between the mine and Radio Tower East. Less continuous zones complicated by shallow oxidation were found at the Cone area, northeast of Radio Tower East.

A decision to mine at Radio Tower East beginning late 1999 was made based on a pit design for 6 million tons @ 0.027 opt gold (160,000 ounces contained) at a 0.32 strip ratio. Headwaters adds approximately 50,000 ounces at a 0.50 strip. Pending infill drilling and metallurgical testing, Jasperoid Hill, Cone, and Radio Tower West may add an additional 150,000 near surface ounces. Including the deeper zones at Radio Tower East/Headwaters, over 500,000 ounces of resource was discovered at an exploration cost of just over \$3.00 per ounce.

#### REFERENCES

- Elison, M. W. and Speed, R. C., 1988, Triassic flysch of the Fencemaker allochthon, East Range, Nevada: Fan facies and provenance: Geological Society of America Bulletin, v. 100, p. 185 - 199.
- Elison, M. W. and Speed, R. C., 1989, Structural development during flysch basin collapse: The Fencemaker allochthon, East Range, Nevada: Journal of Structural Geology, v. 11, n. 5, p. 523 - 537.
- Hastings, J. S., Burkhart, T. H., and Richardson, R. E., 1988, Geology of the Florida Canyon gold deposit, Pershing County, Nevada: Bulk Mineable Precious Metal Deposits of the Western United States: Symposium Proceedings published by The Geological Society of Nevada.
- Silberling, N. J. and Wallace, R. E., 1969, Stratigraphy of the Star Peak Group (Triassic) and overlying Lower Mesozoic rocks, Humboldt Range, Nevada: Professional Paper 592.

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#### Job Description -Senior Environmental Engineer

Teck Resources, Inc. is seeking gualified applicants for the position of Senior Environmental Engineer. Primary responsibility will be management of the baseline studies and documentation necessary to support NEPA review of the Pogo project. The successful candidate will have technical and administrative experience in many of the following disciplines, particularly in conjunction with prior NEPA reviews of mining operations: aquatic resources, including fisheries, benthic invertebrates, and water quality; air quality permitting, including baseline and impacts modeling; wetlands, including functional assessments; rock and leachate geochemical modeling; and hydrology and water quality modeling, including water discharge permit documentation. Responsibilities will include management of various consultants in these disciplines throughout the NEPA review and development of an environmental management system for the project construction and operation.

This permanent, full-time position is located in Fairbanks, Alaska and will report to the Alaska Regional Manager. Teck Resources, Inc. is the operator of the Pogo Project, an underground gold exploration project located 35 air miles northeast of Delta Junction, Alaska. Salary is DOE. Respond to Senior Environmental Engineer, Teck Resources, Inc., 3520 International Street, Fairbanks, AK 99701.

### MISCELLANEOUS

**John** (Jarbidge) **Bernt**, the delicate spine of the ol' gal in the GSN office is beholding to you. Nothing like having a strong, helpful man show up when you're in the middle of relocating boxes of books and moving loaded file cabinets. Much obliged!

GSN will be in booth 1220 at the Prospectors & Developers Association Convention in Toronto, ON, March 5-8. We look forward to seeing many of our Canadian members as well as an assortment of familiar faces from other countries as well!

Thanks to Honorary Member Vic Kral, the GSN office personnel know what day of the week it is. Each year the Nevada Section of the SME-AIME compiles an historic Mining Calendar, as part of their fund-raising efforts. For the past four years Vic has always made sure the GSN receives one. If you'd like to purchase one of these unique calendars, just give him a call at 775/828-0124.

▶ Neville, you little Devil (boy am I going to get scowled at for this one), thanks for scooping up those boxes of display publications to haul to PDAC. As in years past, you've saved GSN a small fortune in shipping. We do appreciate your efforts, Mr. Rhoden.

# **DIRECTORY DUDS**

The printer accidentally included some previously culled, flawed membership directories in our outgoing shipment. If you were one of the unlucky recipients, just give the GSN office a call and we'll send a replacement.

# A GEOLOGIST?

Submitted by Peg O'Malley

#### Top Ten Signs You Might Be a Geologist:

- 10. You have ever had to respond "yes" to the question, "What have you got in here, rocks?"
- 9. You have ever taken a 22-passenger van over roads" that were really intended only for cattle?
- 8. You have ever found yourself trying to explain to airport security that a rock hammer isn't really a weapon?
- 7. Your rock garden is located inside your house.
- 6. You have ever hung a picture using a Brunton as a level?
- 5. Your collection of beer cans and/or bottles rivals the size of your rock collection.
- 4. You consider a "recent event" to be anything that has happened in the last hundred thousand years.
- 3 Your photos include people only for scale and you have more pictures of your rock hammer and lens cap than of your familv.
- 2. You have ever been on a field trip that included scheduled stops at a gravel pit and/or a liquor store?

#### And the #1 sign you might be a geologist:

- 1. If you've ever uttered the phrase "have you tried licking it?"
  - a. in reference to a mineral?
  - b. with no implied innuendo?
  - c. while pawing an evaporite?

October 12, 1999

Dear Mr. Kizis and the members of GSN,

I would like to thank you again for your wonderful generosity. I have been fortunate enough to have received the Geological Society of Nevada Scholarship for this year. Yet again I am heartened and grateful for the support that I have received over the past few years from your organization. Being involved with GSN, both as a member and as a student scholarship recipient has been one of the most positive experiences of my university career.

Currently, I am a senior in the Geological Sciences Department, majoring in geology. I am planning on completing my degree in May and continuing on in graduate school with the eventual goal of earning my doctorate in paleontology. My goal is to work at either a university or a museum as a collections curator or possibly as an educator. At this point, the possibilities are quite endless.

Again, I thank you for the scholarship you have donated. It has made my last year at UNR one that I can devote to my education. Your generosity has reminded me that it is not just the rocks that make geology such a unique and special field of study.

Very sincerely yours

Sarah F. Nürberg Sarah E. Norberg

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# A SPECIAL "THANKS" TO 98 DEDICATED VOLUNTEERS

The Technical Program Committee for the GSN 2000 Symposium wishes to say THANK YOU to the 100 dedicated volunteers who have reviewed manuscripts for publication in the Proceedings Volumes. Their tremendous efforts allow us to be on schedule for the October 2000 printing date. Some achieved world class reviewer status; all are deeply appreciated. THANKS AGAIN!

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### **UP-COMING EVENTS**

**Mar 8-9** 14th High Altitude Revegetation Workshop in Fort Collins, CO. G Thor, 970/491-7296, www.highaltitudereveg.com

**Mar 14** AEG SW Section LV Subsection Meeting at Las Vegas, NV. Jim O'Donnell, U.S. DOE, Seismicity, Seismic Hazards, & Anomalous Shaking in the Las Vegas Valley. Social-5:30, dinner-6:30, talk-7:30. Res D Blatchford, 702/251-5449

**Mar 16** CO Scientific Society Meeting at Golden, CO. Jim White, CU Boulder, New Developments in Carbon Cycle & Climate Change. Social-7:00, talk-7:30. M Hudson, 303/236-7446

Mar 16-17 AAPL 16th Annual Mining/Land Resource Inst at Reno, NV. 817/847-7700, www.landman.org

Mar 17 GSN Membership Meeting at Reno, NV. Richard K. Larsen, Geology of Newly Discovered Gold Deposits at the Florida Canyon Mine, Pershing County, NV. 775/323-3500, gsn@mines.unr.edu

Mar 18 Landman's Assn. Dinner/Dance, Hidden Valley Country Club at Reno, NV. Social-6:30, dinner-7:30. S Mason, 775/824-4000

Mar 23 GSN Elko Chapter Meeting at Elko, NV. Lewis Teal, Newmont Gold Corp., New Exploration Discoveries at the Yanacocha Deposit in Peru. J Pontius, 775/778-9280

**Mar 24** AEG SW Section LV Subsection Workshop at Las Vegas, NV. One-Day Workshop on Geologic & Hydrologic Hazards in the Las Vegas Valley: Reducing Risk. D Blatchford, 702/251-5449

Mar 25 AEG SW Section LV Subsection Geologic Hazards Field Trip. D Blatchford, 702/251-5449

**Mar 30 GSN SNC Meeting** at Las Vegas, NV. Paul Bowen, R.P. Bowen Engineering Inc., Exploration for a VMS Gold Deposit. K Goebel, 702/263-7600, or J Cline, 702/895-1091

Apr 3 DREGS Meeting at Golden, CO. dregs@dregs.org

**Apr 10-14** Univ of Wisconsin-Madison and NV Bureau of Land Management Program, Integrated Mining & Land Reclamation Planning at Reno, NV. 925/757-7547

Apr 25-28 Randol Gold & Silver Forum 2000 at Vancouver, B.C. 303/526-1626, www.randol.com

**Apr 27-29** GSA Cordilleran Section 96th Annual Meeting at Vancouver, B.C. Abstracts-303/447-2020, x161, ncarlson@geosociety.org. Technical program-B Struik, 604/666-6413, bstruik@gsc.nrcan.gc.ca, D. Allen, 604/291-3967, dallen@sfu.ca, or D Thorkelson, 604/291-5390, dthorkel@sfu.ca

May 8-12 CMA CA Mining 2000: The Odyssey Continues at Palm Springs, CA. 916/447-1977



May 15-18 Geology & Ore Deposits 2000 - The Great Basin & Beyond, A GSN Symposium at Reno/ Sparks, NV. 775/323-3500, gsnsymp@unr.edu, www.gsnv.org

July 31-Aug 3 Pacific Rocks 2000, the Fourth North American Rock Mechanics Symp at Seattle, WA. M Cramer, 303/771-2000, mcramer@expomasters.com

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