

Gold Deposits of Northern Nevada Society of Economic Geologists Foundation Student-Dedicated Field Course

May 10-18, 2007

Field Course Leaders:

WILLIAM X. CHÁVEZ, JR. (SEG 1990 F), ERICH U. PETERSEN (SEG 1986 F), AND STEVE A. GARWIN (SEG 1996 F)

The second SEG student-dedicated field course was held in mid-May to examine "Carlin-style" gold deposits in northern Nevada. A total of 16 undergraduate and graduate students representing 14 universities and 9 countries participated in the nine-day excursion.

The field course began in the **Battle Mountain district** with a visit to the Phoenix Au-Cu system, where field exposures and drill core were examined, and local stratigraphic controls of gold occurrences and the importance of district-scale structural controls on copper and gold mineralization were emphasized.

Next, the **Carlin Trend** was introduced with a visit to Newmont Mining Corporation's Maggie Creek core facility, where an entire day was spent reviewing drill core representing "Upper Plate" and "Lower Plate" assemblages. The complex structural and stratigraphic settings of Carlin-style gold occurrences were emphasized, together with the subtle differences between gold-related and barren alteration-mineralization assemblages.

Then followed a day-long trip to the **Cortez district**, where the regional and local settings of gold mineralization characterizing one of the earliest major gold districts in northern Nevada were reviewed. Stops in the Pipeline and Cortez mines permitted examination of

the complex structural settings of rock units in another one of the gold deposit "trends" in northern Nevada.

In the evening, Steve Garwin presented a discussion of the geologic and geochemical characteristics of Carlin-style gold deposits. He borrowed from his SEG Gold Workshop lecture materials to provide a solid background for the student participants and several mine geologists who attended the presentation.

After returning to Elko, the group spent the next two days in the **middle and northern portions of the Carlin Trend**, observing surface and underground exposures from the Gold Quarry/Chukar mines to the Post-Betze mine area. The importance of Eocene-age intrusive rock units, local "feeder" structures and tectonic windows, and alteration paragenesis were discussed at numerous stops, with both mine and exploration geologists taking time to explain the parameters used in ore search and, significantly, the definition of "ore."

The trip concluded with a return to the Winnemucca area and visits to the **Twin Creeks mine** and the venerable **Getchell/Turquoise Ridge district**. The importance of local faults, reflecting



Field trip participants pose on a visit to Newmont's Gold Quarry mine, just after blast in the pit (note dust in the background).

Rear (left to right) Jeremy Fairbanks (USA), Doug Cavey (Canada), Remigio Ruiz (Argentina), Melanie Mercier (Canada), Aristeo Nuñez Othón (Mexico), Thomas Dittrich (Germany), John Porter (USA), Christopher Wyatt (USA), Constanza Jara B. (Chile), Angela Page (Canada), Erdem Yetkin (Turkey). Front (left to right) Derick Unger (USA), Molor Erdenebat (Mongolia), William X. Chávez, Jr. (USA), John Morkeh (Ghana), Diego Guido (Argentina), Gerd G. Sielfeld Corvalan (Chile), Erich U. Petersen (USA).



Group members gather for a backyard barbecue at Sue Abbott's after a tour of Newmont's Twin Creeks mine and before a spontaneous international soccer match among field trip participants.

Rear (left to right) Derick Unger (USA), Gerd G Sielfeld Corvalan (Chile), Doug Cavey (Canada), Constanza Jara B. (Chile), Thomas Dittrich (Germany), Molor Erdenebat (Mongolia), Aristeo Nuñez Othón (Mexico), Diego Guido (Argentina), John Morkeh (Ghana). Front (left to right) Remigio Ruiz (Argentina), Jeremy Fairbanks (USA), Christopher Wyatt (USA), Melanie Mercier (Canada), William X. Chávez, Jr. (USA), Erich U. Petersen (USA), Erdem Yetkin (Turkey), Angela Page (Canada), John Porter (USA).



Students Melanie Mercier and Doug Cavey, along with Joe Sagar of Newmont, are outfitted to enter Newmont's Chukar mine.



Underground in Newmont's Chukar mine. Joe (center) explains mine scale geology to Diego Guido and Remigio Ruiz.

regional structures, was evident in excellent exposures in both mine areas and provided an appropriate conclusion to the review of an important class of gold ore deposit types.

The last evening as a group was spent in Reno, where the students organized a wonderful and memorable farewell dinner. As with the previous SEG Field Course, we acknowledged that we were saying "goodbye" only temporarily, and that acquaintances would likely be renewed again somewhere—probably on an outcrop or in a stope ...or at a local cantina!

It is a pleasure to acknowledge the excellent presentations and tours given by the company mine and exploration geologists, which contributed greatly to the success of this field course: **Fred Breit (Newmont)**, provided an overview of the Phoenix property, and conducted an excellent introductory field visit to this established district; **Rachel Burgess and Sara Smith (both Newmont)** explained the essentials of rock types and stratigraphy of the Carlin Trend during two days of reviewing core and surface exposures in the Gold Quarry and related areas of the middle portions of the Carlin Trend; **Bob Leonardson, Kevin Creel, Mark Bradley, and**



At the bottom of Newmont's Twin Creeks mine near Winnemucca. Molor Erdenebat and Erdem Yetkin listen to Patrick Donovan's (not pictured) explanation of the role of decalcification in ground preparation for gold mineralization.



Aristeo Nuñez Othón, Diego Guido, and Molor Erdenebat pose outside the outfitting room for underground tours of Newmont's Chukar mine.

Nancy Richter (all Barrick Gold) presented details of the regional and local settings of ore bodies in the Pipeline/Cortez Hills area, and led tours of the Pipeline and Cortez open pits; **Sean McCann (Newmont)** introduced the geology of the Leeville area, and **Joe Sagar (also Newmont)** led an inspirational underground mine tour at the Chukar mine; **Patrick Donovan, Kent Pearce, and Susan Abbott (all Newmont)** provided a thorough and very detailed visit to the Twin Creeks mine; and **Karl Marlowe, Keith Wood (both Barrick), and Donald MacKerrow (Barrick Consultant)**, explained the complex geology of the Getchell district. The efforts of these geologists and their colleagues were essential in giving students an outstanding background in Carlin-type ore deposits. Our sincere thanks and appreciation to all!

Interaction with professional geologists is an integral and essential component of these SEG field courses. In addition to interaction with company geologists in the field, dinners hosted by their personnel provided students with excellent opportunities to discuss career possibilities in mine geology and minerals exploration. These discussions contributed significantly to the collective experiences of the students.

Finally, we gratefully acknowledge the generous support provided by Newmont Mining Corporation and Barrick Cortez Gold Mines. Especially notable were the efforts of **Carole T. Smith and Jodi Moss (both Newmont)**, whose logistical arrangements and financial assistance made this field course flow smoothly and effortlessly from start to finish. As with the first

student-dedicated field trip, vital funding provided by the Society of Economic Geologists Foundation and the donors to the SEG Student Field Trip Fund made this second SEG Field Course possible. The logistical support provided for the students and field course leaders by Sue Courtney and John Thoms at SEG Headquarters was indispensable—once again, our hardhats are off to both of you.



Underground in Newmont's Chukar mine. Aristeo Nuñez Othón searches for and finds visible gold.



At the closing meeting and awarding of certificates of participation, Best Western Hotel in Reno (by airport). Diego Guido, Molor Erdenebat, Erdem Yetkin, Thomas Dittrich, and Gerd G. Sielfeld Corvalan.

Upcoming SEG Field Course Announced

The next SEG Student-Dedicated Field Course, open to students and (up to four) professionals, will take place in early January 2008. The trip will be organized and led by William X. Chávez, Jr. and Erich U. Petersen, and will emphasize the **Cu-Au-Fe "IOCG-style" and the Cu-Ag andesite-hosted deposits of northern Chile**. Students interested in participating in this course should check the SEG website at www.segweb.org for details and application instructions. Professionals who would like to be considered for participation should contact John Thoms of the SEG Foundation for further information (johnthoms@segweb.org). 