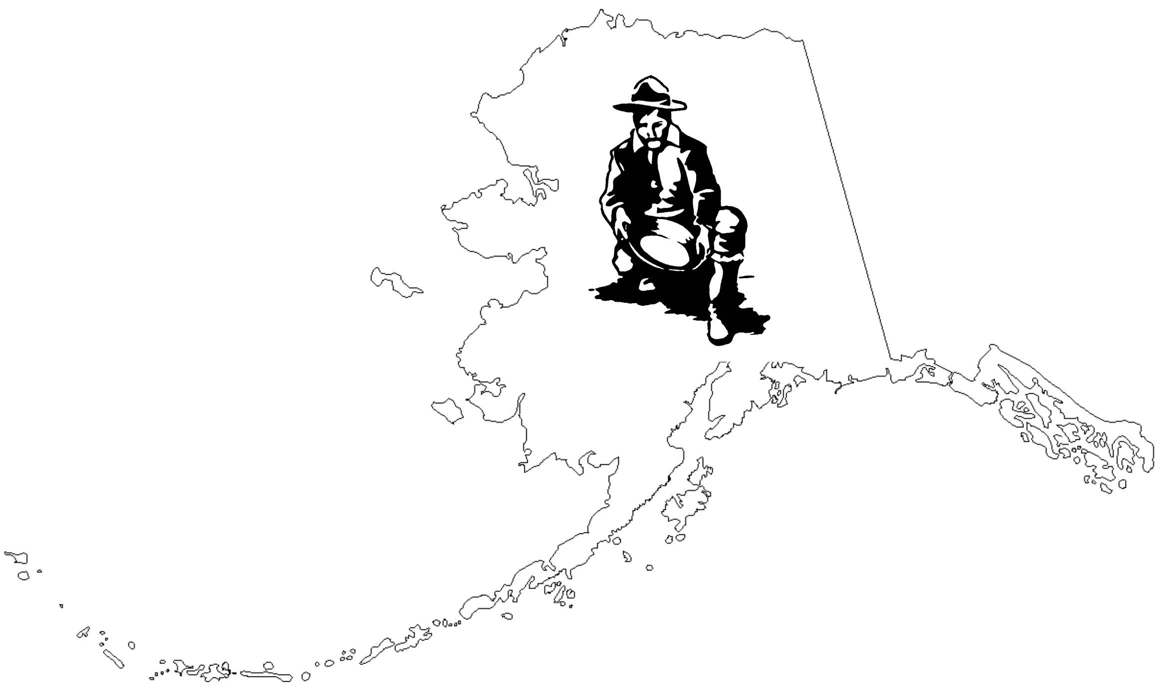
MINING

MODERN MINE RECLAMATION

ABSTRACTS



ALASKA MINERS ASSOCIATION
2009 ANNUAL CONVENTION

November 2 - 8, 2009
Sheraton Anchorage Hotel
Anchorage, Alaska

The Alaska Miners Association thanks the following individuals for their efforts in the production of the 2009 convention.

Convention Committee:

Convention Chairman:	**Kevin P. Adler**, On-Line Exploration Services, Inc.
Short Courses:	**Jeanine Schmidt**, U.S. Geological Survey
	Bill Jeffress, SRK Consulting Engineers
	Ted Hawley, HDR
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Session Chair: **Greg Beischer**

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Don Poirier*, Vice President Corporate Development, Hecla Mining Company*

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MC: **Curt Freeman**

Short Courses

Monday and Tuesday, November 2 and 3, 2009, 8:00 a.m. - 5:00 p.m.

APPLIED STRUCTURAL GEOLOGY IN MINING AND EXPLORATION

Course Instructors: **James Siddorn, M.Sc, P.Geo.,** and **Blair Hrabi**, *SRK Consulting*

SRK's 2 Day Applied Structural Workshop is a practical, interactive course that provides a workable toolkit to apply structural geology effectively and to add value to projects at all stages from grassroots exploration to mining.

The workshop comprises alternating brief lectures and practical exercises and case studies based on deposits SRK has worked on worldwide. It includes modules on:

- Applications of structural geology concepts to mineral systems: controls on permeability; hydrodynamics; structural ground preparation; and active deformation driving hydrothermal fluid flow.
- Structural mapping techniques for mine and exploration geologists: designing a mapping campaign including "what do we map?", and "what tools do we have?"; interpretation of map patterns and working in 4 dimensions.
- 3D visualization of geology and mineralization: traditional structural and modern computer aided techniques for 3D geological analysis and modeling.
- Analysis of faults and fault systems: brittle and ductile faults; timing of mineralization relative to deformation; geometry, kinematics, and displacement; controls on ore plunge and the role of dilational and compressional jogs; hydrothermal vein styles and the structural interpretation of vein systems.
- Analysis of folded rocks: description and interpretation of fold systems; polydeformed terranes; fold influence on mineralization distribution and ore plunge.
- Analysis of structures in drill core: unoriented core; the role of oriented core and televiewer surveys in an exploration campaign; orienting techniques and data analysis.
- Regional tectonic environments: linking deposit scale and regional scale interpretations; tectonic settings, fault and fold networks associated with extensional, compressional and strike slip settings; how the fractal nature of structural geology (deposit- to regional- scale) aids understanding the types and distribution of deposits.

Monday and Tuesday, November 2 and 3, 2009, 8:00 a.m. - 5:00 p.m.

MODERN MINE RECLAMATION

Course Coordinator: **Ted Hawley**, *HDR*

This course will include technical sessions and case studies covering key issues associated with modern mine reclamation. Topics include environmental baseline programs, reclamation planning, water balance, acid rock drainage, and financial assurance cost estimating. Presentations will include:

- Planning for Mine Closure: pre-planning at the exploration stage; closure planning during the entire development and production sequence.
- Environmental Baseline Program Design and Data Collection for Closure: checklists for closure; air quality; acid generation in block modeling; acid-rock drainage and from pit walls, pit lakes and waste dumps; delineation of wetlands and planning of compensatory mitigation; endangered species and habitat; pit lake stratification; water balance and water chemistry.
- Reclamation Concepts: concurrent and staged reclamation; geomorphologic design; wetlands restoration and construction; vegetation selection and planting; erosion control; storm water control; reclamation of peat.
- Post-Closure Care and Maintenance: acid-rock drainage and reclamation case history; cost modeling; financial assurance pool; bonding pools and trust fund issues.
- Permitting: reclamation issues during the permitting process.
- Large and Small Mine Reclamation: coal and metal mines; lode and placer mines; surface and underground mine case studies.

Monday and Tuesday, November 2 and 3, 2009, 8:00 a.m. - 5:00 p.m.

ARCGIS FOR MINING GEOSCIENCE

Course Instructor: **Willy Lynch, M.S., P.Geo.**, *ESRI*

This course is designed for geoscientists working in the mining industry, and introduces ArcGIS tools and practical skills that can be directly applied to solve mining geoscience problems such as detecting mineral occurrence patterns, locating prospective deposits, and identifying optimal areas for mineral exploration.

Those who complete this course will be able to: Display and symbolize geoscience data layers in ArcMap; create presentation-quality geologic maps and graphs; generate and view statistics for geoscience data; create a geodatabase to store geologic, geochemical, geophysical, and raster data; and create a model that automates geoprocessing tasks used to locate prospective deposits.

Topics to be covered include:

- Symbolizing geoscience data: geology, faults, fold axes, and structural measurements.

- Visualizing geochemical data using graduated color and graduated symbol legends.
- Plotting a geology map: Creating and exporting layouts to PDF and image files.
- Georeferencing images: using latitude/longitude coordinates with scanned maps; control points; transforming pixels to map units; aligning images with coordinate shapefiles.
- Working with projections: defining shapefile and CAD file coordinate systems; defining custom coordinate systems; reprojecting NAD27 datasets to NAD83.
- Digitizing and editing: creating line and polygon features; moving vertices; assigning attributes.
- Finding anomalous geochemical samples: generating statistics for element values; calculating anomaly thresholds; classification histograms; charting symbols; displaying individual values.
- Spatial analysis: proximity using buffers; overlay analysis using intersect; defining gold targets.
- Using ModelBuilder: creating a model; geoprocessing tools; defining model parameters; generating a report of the model results.
- Creating metadata in ArcCatalog: the FGDC metadata standard; metadata style sheets and editing.
- Building a geodatabase: importing data; creating feature datasets, classes, and attribute domains.

Saturday, November 7, 2009, 8:00 a.m. - 5:00 p.m.

MSHA SURFACE REFRESHER

Course Instructor: Mining and Petroleum Training Service

This course covers the annual refresher for surface mine operations, including first aid and safety training as required by the Federal Mine Safety and Health Administration. A surface refresher training certificate is issued at the completion of this course.

Saturday, November 7, 2009, 8:00 a.m. - 5:00 p.m.

MSHA UNDERGROUND REFRESHER

Course Instructor: Mining and Petroleum Training Service

This course covers the annual refresher for underground mine operations, including first aid and safety training as required by the Federal Mine Safety and Health Administration. An underground refresher training certificate is issued at the completion of this course.

Student Poster Session

Wednesday, November 4, 2009, 8:00 a.m. - 5:00 p.m.

ALASKA'S CLEAN COAL, USIBELLI COAL MINE

Paul Philemonof and Victoria Owens

University of Alaska Anchorage

Usibelli Coal Mine (UCM), Healy Alaska, is the only operating coal mine in the state despite the numerous identified coal deposits found throughout the state. The family owned company has been operating for over 70 years. Much of the coal is used in interior Alaska to provide power and heat. The Usibelli group, which contains the coal that is mined by UCM, consists of three separate coal-bearing sequences, the Healy Creek formation, Suntrana formation, and the Lignite Creek formation. They are all Cretaceous aged, non-marine fluvial sediments. These formations are found on the northern foothills of the Alaska Range in synclinal basins. In September 2009, the UAA Geologic Resources of Alaska class toured the UCM operations in Healy. UCM uses a strip mining technique. The coal is crushed on site and is tested for a variety of parameters including compositional components and BTU yield before the coal is loaded and transported to customers. One aspect that makes the coal exceptional is the low average sulfur content of 0.3%. Settling ponds are used to treat water from the mine and are tested on site to insure that it meets all environmental standards. UCM uses multiple methods to reclaim all previously mined areas. Currently UCM is looking to expand its operations out to the Jumbo Dome area. The coal found in interior Alaska is some of the world's cleanest coal. This makes the coal very desirable across the world as it reduces some of the negative affects that the uses of coal create.

Reference:

Usibelli Coal Mine, 2009, www.usibelli.com

WORLD CLASS ZINC: FIELD OBSERVATIONS AT RED DOG MINE

Katrina Chambon, Clifton Fox, and Rebecca Hardcastle

University of Alaska Anchorage

The UAA Resources of Alaska class took a field trip to the Red Dog Mine in order to experience and understand the processes of an operating mine. Red Dog Mine is located in the De Long Mountains in the Brooks Range of northern Alaska. The deposit of black shale-host rock was formed in a deep marine environment during the Mississippian- to Pennsylvanian-age and was accreted onto land in the second lowest allochthon of the De Long Mountains range in the Kuna Formation. The original deposit was fractured while being thrusted onto land and separated into four smaller deposits, the Qanaiyq, Main, Aqqluk, and Paalaaq. The Main deposit, which is currently the only deposit being mined, is expected to be exhausted within the next few years; therefore the Aqquluk deposit is undergoing the permitting process and has recently been approved. There are many environmental challenges that Red Dog has had to overcome in order to gain the permits necessary to begin mining the new pit. The ore body includes minerals such as lead, zinc, and silver and is classified as a sedimentary exhalative deposit. The field trip consisted of a tour of the mill and the tailings pond and discharge area, a field exercise collecting soil samples, and conducting a water chemistry experiment.

THE PEBBLE PROJECT: A STUDENTS PERSPECTIVE

Jodie Banks, Megan Cardenas, and Anthony Fletes

University of Alaska Anchorage

The Pebble prospect encompasses the largest copper porphyry deposit known in Alaska. The Pebble Limited Partnership, is a joint project between Anglo American PLC and Northern Dynasty Ltd. The project is in the pre-feasibility stage of mine development. The definition drilling program and results from assays indicate the inferred resources amount to 72 billion pounds of copper, 94 million ounces of gold and 4.8 billion pounds of molybdenum.

The Pebble deposit is located 27 kilometers west of Illiamna in the Kahiltna terrane in southwest Alaska. The deposit is covered by a Tertiary volcanic conglomerate overlaid by Cretaceous alluvium and glacial till. From the Jurassic to the Cretaceous the Kahiltna Flysch host rock was intruded by igneous bodies related to continental subduction volcanoes and a fault structure thought to be a crustal suture. Later granodiorite intrusions into the area in the late Cretaceous created systems of hydrothermal activity in the rock. The resulting changes in temperature, pressure, and chemicals altered the rock and deposited minerals such as bornite, chalcopyrite, gold, molybdenum and magnetite.

Environmental baseline studies are being conducted throughout the area in order to understand the local hydrological and ecological cycles. These include meteorological, geochemical, and wildlife studies of fish and mammals. The information gathered will provide a better understanding of the local environment and promote sustainable mining practices.

As students from the Resources of Alaska course in the geological sciences program at the University of Alaska Anchorage we were flown to the Pebble Project for a three day visit. The level of experience with mining operations varied throughout the class. During the site visit we spent time with on-site geologists, learning the geology of the deposit and the techniques used in analyzing and interpreting core. We were informed of the environmental challenges and concerns facing the Pebble Project and learned a few of the steps that the Partnership has taken to evaluate the possible mining footprint. The hands-on experience and presentations from professionals in the field of geology was an invaluable opportunity for each student.

References:

The Pebble Limited Partnership, www.pebblepartnership.com

Young, L. E., St. George, P., and Bouley, B., "Porphyry Copper Deposits in Relation to the Magmatic History and Palinspastic Restoration of Alaska," Economic Geology, 1997, pp 306-333.

Technical Sessions

Wednesday, November 4, 2009, 8:00 - 11:00 a.m.

AGENCY GEOLOGIC INVESTIGATIONS

Session Chair: **Bruce Gamble**, *U.S. Geological Survey*

USING DETAILED AIRBORNE MAGNETIC AND ELECTROMAGNETIC SURVEYS IN 1:63,630-SCALE GEOLOGIC MAPPING

Laurel Burns[1] and Rick Saltus[2]

[1]Alaska Division of Geological & Geophysical Surveys; [2]U.S. Geological Survey, Denver

INTRO

The State of Alaska-funded Airborne-Geophysical/Geological Mineral Inventory (AGGMI) program was established in 1992 to acquire geophysical and—where feasible—geological data for about 40 million acres of high perceived-mineral potential, State-interest land. The program is run by the Alaska Division of Geological & Geophysical Surveys (DGGS). Most of the areas contain $\leq$2% outcrop. Standard products include airborne magnetic and electromagnetic data, flown with ¼ mi- (400m-) line spacing, and inch-to-mile geologic maps. To date, over 12,000 sq miles of State-interest land with high mineral potential have been geophysically surveyed and 6,430 sq miles have been geologically mapped at 1:63,360-scale (inch to a mile) by DGGS through this program. At least one major ore deposit has been found because of the geophysical data and the new geologic mapping produced by DGGS. The success of the AGGMI program has led to incorporation of the yearly program into the permanent DGGS operating budget. The AGGMI program will continue to produce airborne geophysical data and detailed geologic mapping of high potential mineral areas for many more areas.

Funding for DGGS to conduct similar geophysical surveys for federal land in Alaska with high mineral potential was provided by the U.S. Bureau of Land Management (USBLM) between 1996 and 2008. Through these funds an additional 6,430 sq miles were geophysically surveyed. The following two abstracts both discuss extracting information from the AGGMI program geophysical data for geologic mapping.

PART 1

R.W. Saltus[1], M. Deszcz-Pan[1], J.M. O'Neill[1], L.E. Burns[2], M.B. Werdon[2], and R.J.Newberry[3]

[1]U.S. Geological Survey, Denver; [2]Alaska Division of Geological & Geophysical Surveys; [3]University of Alaska, Fairbanks

Airborne geophysical surveys provide reconnaissance geologic information in frontier areas. In particular, magnetic and electromagnetic data can be routinely and easily collected; but it can be difficult to translate the geophysical anomalies and patterns into lines on a geologic map. We have used detailed (flight-line spacing of ¼ mile [400 m] or less) geophysical surveys collected by the Alaska Division of Geological and Geophysical Surveys, to assist geologic mapping at 1:63,360 ("inch to the mile") scale throughout Alaska.

Based on our experience, we can draw some conclusions regarding the integration of geology and airborne geophysical surveys. Electromagnetic data: 1. Linear conductive zones frequently overlie faults. Fault-related conductive zones are commonly enhanced as they correlate with aquifers in valleys and along drainages controlled by crustal displacements. 2. Other conductive zones may reflect mineralized areas and their concealed extent. Magnetic anomalies: 1. Magnetic highs often outline subsurface geologic units, most commonly intrusive bodies that control and/or significantly modify the structural patterns in the map area. 2. Linear magnetic boundaries that bound these magnetic highs indicate geologic contacts, be they faults or intrusive/wall rock contacts. Abrupt linear features indicate vertical boundaries whereas gradational boundary zones may indicate inclined contacts. 3. Linear magnetic lows may indicate major shear zones, as magnetic minerals have commonly been altered or destroyed during shearing. 4. Short-wavelength, shallow magnetic lineaments are useful guides to general geologic and structural trends. These lineaments may record mafic dikes or dike swarms, mineralized areas, penetrative fracture systems, or fault zones.

Interpretive displays of geophysical data that are most relevant to geologic mapping are extremely important and show how best to document the role that geophysical information played in the interpretation of individual geologic elements on the final map. In many cases, it can be the extrapolation of known geologic framework and correlative geophysical signatures into areas of concealed bedrock or poor exposures that reveals the importance of geophysical mapping.

PART 2

L.E. Burns[1], R.J. Newberry[2], M.B. Werdon[1], D.J. Szumigala[1], J.E. Athey[1], and L.K. Freeman[1]

[1]Alaska Division of Geological & Geophysical Surveys; [2]University of Alaska, Fairbanks

Magnetic and electromagnetic data each measure different geophysical parameters, and have repeatedly proven excellent datasets for use in geologic mapping in Alaska. DGGS typically releases grids (layers) for magnetic, first vertical derivative of the magnetic field, three apparent resistivity layers, and DEM data. Understanding the intricacies of the data by looking at 4 or 5 different maps is impossible. Combining two or more of these data layers into one image allows the data to be used more effectively. Unsupervised classification, supervised classification using geologic training groups, and less commonly, supervised classification using geophysical training groups are some of the methods used to combine or classify airborne geophysical data. Using these expands our ability to identify probable faults and map units, make preliminary comparisons between areas, and identify potential mapping inconsistencies.

Unsupervised classification can be used to combine traits of several different data layers at once. The dataset to be evaluated can consist of all the data layers, but typically the magnetic and 7200 and 900 apparent resistivities are the most useful for bedrock mapping. The user chooses how many classes the computer will produce. Producing few classes, like 4 or 6, will show the strongest breaks, if they exist, between geologic groups; producing many classes, like 50 to 100, will be more realistic, but may be difficult to understand exactly why items were divided as they were.

Supervised classification is usually used to predict geologic map units based on geologic training regions generally chosen using geologic units from an existing map. The method usually requires many attempts at the classification, with modifications of the training regions upon seeing the results. Geophysical characteristics of many of the training regions may overlap. Sometimes interpretation of the resulting image must include items like variability of a unit, and one should not necessarily assume a 1:1 correspondence between geologic unit training region(s) and a particular color. This method works best if a field geologist acquainted with geologic units and specific outcrops in the survey area is available to choose and later modify training areas. Supervised classification typically takes much more time than unsupervised classification, and in areas with complex geology and/or abundant faulting and shearing, a good supervised classification model may take a month or more to develop. Variables affecting how well this method works and how much time model development may take include the complexity of the units, alteration of units, shearing, size of the training units chosen, and whether the training units are really representative of the unit. This method can be biased towards the particular geologist's knowledge, or hurt by using a particularly inaccurate geologic map to pick training areas, but given enough trials and time, the outcome from this method will usually look similar to the unsupervised classifications that generated many classes.

Classification using geophysical characteristics is the most informative and typically quickest of these methods. To produce the images, a subset of data, selected by polygon, for two geophysical layers are selected on an X-Y plot ('scattergram), e.g. magnetics on X axis, and an apparent resistivity on Y axis. The corresponding locations for the subset of data are immediately visible on a map of the survey tract. Additional subsets of data are added and displayed by different colors on the map. Sizes and locations of the polygons on the scattergram can easily be changed to investigate relationships immediately. Typically, the most resistive rocks tend to be plutonic or quartz-rich. Geophysical characteristics of slightly altered versions of those rocks generally have lower resistivity and could be shown in a different color. Using the geophysical characteristics for classification permits easy prediction of items such as where exposed or shallowly-buried plutons may exist; how many different phases/rock types might be present in a pluton; whether any areas near or adjacent to a probable pluton might be altered; location of shears that contained probable fluid flow, and many other items.

All three methods discussed are useful. All will tend to produce similar models given enough time and enough correct geologic knowledge and training region selection for the geologic unit training method. The truly distinguishing factor among them is the amount of knowledge that can be learned quickly and easily using the geophysical classification method. We strongly recommend this method.

THE NEW USGS WESTERN ALASKA RANGE PROJECT AND PRECURSORY RESULTS FROM THE TYONEK QUADRANGLE

Peter J. Haeussler, Dwight Bradley, Robert Ayuso, Paul Layer, Richard Friedman, Paul O'Sullivan, Marti Miller, Sue Karl

U.S. Geological Survey

In fiscal year 2010, the USGS initiated a new project in the western Alaska Range that should improve the effectiveness of mineral exploration and assessment by outlining the tectonic, igneous, and metallogenic evolution of the region. Active exploration in the region involves at least six mineral deposit types, including Pebble-type Cu-Au porphyries. The area spans various terrane boundaries, and the nature and tectonic environments of these terranes are poorly known. We aim to conduct geologic mapping and collect additional geophysical, geochemical and stream sediment data. This will allow us to determine the number, nature, and extent of igneous suites, establish their tectonic framework, and better define and characterize the metallogenic belts in the area. The region borders the Susitna basin, encompasses active faults, such as the Denali, and additional work will examine basin evolution and active tectonics.

This work is motivated by responses to stakeholder interest in the area, as well as by results from USGS reconaissance studies in the region. Between 2001 and 2005 we spent 11 days in the field in the western Tyonek quadrangle examining critical mapping issues, and collecting samples for geochronology, thermochronology, and geochemistry. We obtained 34 new $^{40}Ar/^{39}Ar$, 8 U/Pb zircon, and 6 LA-ICPMS detrital zircon ages. We report preliminary results here.

We found that most of the Tordrillo Mountains consist of calc-alkaline (medium- to high-K) granitic rocks (SiO2 ~54-77 wt. %) with ages between 85 and 55 Ma. The oldest pluton dated was near Whiskey Lakes and yielded an age of 89.7±3.0 Ma (Ar-Ar, hornblende), which is similar to the age of the pluton at the Pebble deposit. The pluton that hosts the Miss Moly molybdenum prospect yielded an age of 60.2±0.3 Ma (U/Pb, zircon). The Nd isotopic compositions and Pb isotope data from granitic rocks demonstrate mantle contribution of juvenile materials to the crust. The country rocks to Tordrillo batholiths consist of Lower Cretaceous to Paleocene sedimentary and volcanic rocks. Previous geologic maps suggest the rocks may be of Jurassic age, but we found no evidence of this. One map depicted a large Tertiary volcanic field at the crest of the Tordrillo Mountains, but we found no evidence of it. A basaltic dike swarm, near the Trimble Glacier, has a much larger extent than previously mapped. They strike north-northwest, dip steeply west, and extend to the region near Mount Spurr. We obtained $^{40}Ar/^{39}Ar$ whole rock ages on the dikes between 58.3±1.0 and 51.0±1.0 Ma, with a weighted mean of 57±2 Ma. Perhaps the biggest surprise of our preliminary efforts was from detrital zircon geochronology of rocks previously mapped as MzPzu (Mesozoic and Paleozoic, undivided) along the western edge of the Tyonek quadrangle. We obtained both Lower and Upper Cretaceous depositional ages from four samples, but one had zircons as young as 55 Ma, which lies on the Paleocene-Eocene boundary. Thus, the MzPzu unit also has Cenozoic age rocks in it (perhaps CzMzPzu would have been a better label). Apatite fission track and apatite U-Th/He dating of samples from a vertical elevation transect in the Tordrillo Mountains reveals there was a significant cooling and an exhumation event around 23 Ma. This time correlates with the base of the Tyonek Formation in Cook Inlet, and thus exhumation of the Tordrillo Mountains contributed to much of the sediment in the basin. Additional exhumation in the highest peaks of the Tordrillo Mountains occurred around 6 Ma, synchronous with exhumation of Denali (Mt. McKinley). There is almost no trace of mid- to late Tertiary magmatism. We dated a crystal tuff in the lower part of the West Foreland Formation near Capps Glacier at 43.4±0.2 Ma (U/Pb, zircon), and an andesite west of Dinglishna Hill at ~32 Ma (U/Pb, zircon). One of the oldest Spurr Volcano lavas yielded an age of 1.8±0.5 Ma (Ar-Ar, whole rock). We anticipate that additional work in the region will provide a rich understanding of the tectonics and metallogeny of the Western Alaska Range.

NEOPROTEROZOIC TO TRIASSIC RIFT-ASSOCIATED VMS DEPOSITS IN THE ALEXANDER COMPOSITE OCEANIC ARC TERRANE, SOUTHEAST ALASKA

S.M. Karl[1], R.A. Ayuso[2], J.F. Slack[2], and R.M. Friedman[3]

[1]USGS Anchorage, Alaska, [2]USGS Reston, Virginia, [3]PICGR, UBC, Vancouver, British Columbia

Four episodes of extension in oceanic arcs that amalgamated to form the Alexander terrane in Southeast Alaska include three generations of volcanogenic massive sulfide (VMS) deposits that have isotopic and geochemical signatures reflecting evolution of the composite arc terrane. The oldest rocks in the Alexander terrane are Neoproterozoic metavolcanic and metasedimentary rocks that have primitive Nd, Sr, and Pb isotopic signatures and trace element geochemistry that indicate an oceanic arc setting. The largest Neoproterozoic VMS deposit, Khayyam, produced 210,000 t of Cu-Ag-Au ore. Khayyam is associated with sheeted mafic to felsic dikes that indicate extension, and a rifted arc setting is inferred for the hydrothermal system that produced Khayyam and similar Neoproterozoic VMS deposits in the Alexander terrane.

Voluminous Ordovician dioritic plutonism, mafic to felsic volcanism, and regional metamorphism resulted from collision of an Ordovician arc with the Neoproterozoic arc. Magmatic ages for this arc activity include a new U-Pb age of 476.7±1.5 Ma for magmatic zircons from rhyolite on Lookout Mt. at the Niblack deposit. Ordovician sedimentary and volcanic rocks have primitive Nd isotopic compositions that indicate an oceanic arc, and the volcanic rocks have trace element geochemistry that supports a rifted arc setting. Niblack, the best known Ordovician VMS deposit, produced 18,000 t of Cu ore; and has an estimated resource of 2.59 Mt at 1.2% Cu, 2.2% Zn, 33.2 g/t Ag, and 2.3g/t Au. Pb isotopic compositions of Ordovician sulfides are nonradiogenic, but show slightly more dispersion than the Neoproterozoic sulfides, suggesting incorporation of small amounts of evolved sediment, which is reflected in polymictic Ordovician conglomerates that contain metamorphic clasts that resemble the Neoproterozoic rocks, and by Ordovician to Neoproterozoic detrital zircons. REE abundances are greater, and LREE are more enriched, in Ordovician magmatic rocks relative to those of the Neoproterozoic in the Alexander terrane.

Devonian mafic and felsic volcanic rocks associated with mafic dike complexes across Prince of Wales, Kuiu, and Chichagof Islands indicate widespread extension. These volcanic rocks contain ubiquitous disseminated pyrite, but no known VMS deposits. Pre-Devonian fossils in the Alexander terrane lack affinities with fossils from pre-Devonian continents and suggest an isolated oceanic setting. Devonian sedimentary rocks contain the oldest fossils that correlate with fossils from continental areas. The earliest contributions of continental material to the Alexander terrane are indicated by detrital zircons as old as 3 Ga found in Early Devonian conglomerates. Four contrasting Ordovician to Devonian stratigraphic sequences on southern Prince of Wales Island, northern Prince of Wales and Chichagof Islands, Admiralty Island, and the northern Chilkat Mountains have distinct fossils, detrital zircon populations, and igneous geochemistry that suggest amalgamation of several different arcs during the late Paleozoic, culminating in overlap by a widespread Permian volcanic arc sequence that had no associated rifting. The Alexander terrane as currently delineated was assembled by the Late Permian.

Quartz diorite and mafic and felsic volcanic rocks that yield 226 to 210 Ma U-Pb zircon ages comprise a Late Triassic arc that extends from Duke Island to the Alsek Ranges of British Columbia. Late Triassic volcanic and sedimentary rocks contain the largest VMS deposits in the Alexander terrane, including Windy Craggy and Greens Creek. The Windy Craggy deposit has estimated reserves of 297.4 Mt at 1.4% Cu, 0.3% Zn, 4 g/t Ag, and 0.2 g/t Au. The Greens Creek deposit has produced >9 Mt of ore and has 8 Mt of proven reserves at 10.6% Zn, 3.8% Pb, 426.4 g/t Ag, and 3.4 g/t Au. Trace element geochemistry and Nd isotopes from the Triassic igneous rocks reflect mantle sources and record the continued oceanic character of the Alexander arc. Graben structures, growth fault breccias, and associated mafic sills and flows indicate an extensional setting. Pb isotopic compositions of Triassic rocks are significantly more radiogenic than those of the Neoproterozoic and Paleozoic rocks, and may reflect accretion of more evolved crust to the Alexander terrane during the late Paleozoic. The order of magnitude increase in sizes of the Triassic deposits relative to those of the older deposits may result from a combination of factors common to VMS deposits, such as size of heat sources, hydrothermal cell configuration, and volume of sedimentary cover, influenced by igneous and tectonic thickening of the Alexander arc crust following collision and amalgamation of its component arcs.

UPDATE ON GEOLOGICAL AND GEOPHYSICAL INVESTIGATIONS IN THE SLATE CREEK MINING AREA, ALASKA

Jennifer E. Athey[1], Lawrence K. Freeman[1], Chad P. Hults[2], David J. Szumigala[1], Melanie B. Werdon[1], Richard D. Koehler[1], and Laurel E. Burns[1]

[1]Alaska Division of Geological & Geophysical Surveys (DGGS), [2]U.S. Geological Survey, Alaska Science Center (USGS)

In July 2009, the Alaska Division of Geological & Geophysical Surveys (DGGS) conducted geologic mapping in the Slate Creek area 20 miles northeast of Paxson and immediately south of the Denali fault (parts of Mount Hayes A-2 and A-3 quadrangles). As part of the Airborne Geophysical/Geological Mineral Inventory (AGGMI) Program, we are utilizing new detailed airborne electromagnetic and magnetic geophysical data for the Slate Creek–Slana River area (Burns et al., 2009), whole rock data, 40Ar/39Ar and detrital zircon ages, thin-section and grain-mount petrography, palynology and macrofossils, historical, and industry data in conjunction with field observations to produce a 1:50,000-scale geologic map. The area has high mineral interest and is a key location for understanding the active Denali fault system. DGGS plans to publish the map on our website (http://www.dggs.dnr.state.ak.us/) in winter 2010.

The Slate Creek fault, a high-angle fault system parallel and possibly related to the Denali fault system, separates two dissimilar sections of bedrock described by Nokleberg *et al*. (1992). South of the Slate Creek fault, volcaniclastic rocks, thin limestones, volcanic sedimentary rocks, and basaltic to rhyolitic (Athey, 1999) “coherent” volcanic rocks compose the Permian–Pennsylvanian Slana Spur Formation. Red, oxidized quartz–pyrite gossans spatially associated with quartz-phenocryst-bearing volcanic rocks contain up to 0.72 ounces of gold/ton (Athey, 1999). Farther south, near the edge of the study area, five or six 0.5- to 2-mile-wide, granite to basalt bodies of unknown age and chemistry intrude volcanic rocks of the Slana Spur Formation.

North of the Slate Creek fault, Early Permian Eagle Creek limestone and sedimentary rocks, Late Triassic Nikolai greenstone and minor sediments, Late Triassic Chitistone limestone, and Cretaceous to Jurassic argillite and phyllite compose the upper plate of an apparent north-dipping thrust fault. The lower plate of the thrust fault includes the felsic Slana Spur(?) and Eagle Creek formations, and Tertiary sedimentary rocks. The involvement of Tertiary sedimentary rocks in the thrust fault and the Slate Creek fault system infers a Tertiary, possibly Neogene, age of latest movement on the faults. Two hand-dug trenches on the Denali fault revealed evidence of possible Holocene offsets at this location in addition to the 2002 event. No Quaternary fault movement, other than on the Denali fault, was observed in air photos or outcrop in the study area.

Most of the 183,356 troy ounces of gold (Szumigala *et al*., 2009) and minor platinum group elements (PGE) recorded within the Chistochina mining district were extracted from placers in the Slate Creek area. Placer miners and previous researchers assert that placer gold in Quaternary valley and bench deposits was derived and reconcentrated from semi-consolidated to unconsolidated “round wash” gravels found on higher slopes and ridgetops between Slate Creek and the Chistochina Glacier. The “round wash” gravels, containing up to 113 ppm gold (Bittenbender *et al*., 2007), eroded from fault-bounded and perched, poorly indurated Tertiary conglomerate. In addition to detailed mapping, we are conducting petrologic and palynological studies of the conglomerate to better understand the tectonic history of the area. PGEs in the placer deposits are likely sourced from one or more of the Triassic and (or) Cretaceous(?) mafic and ultramafic bodies in the study area. Planned chemical analyses and age data will help us test their PGE potential, and determine the structural (and intrusive?) relationships of these bodies relative to surrounding units.

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Wednesday, November 4, 2009, 12:00 - 1:30 p.m.

LUNCHEON

Speaker: ***Dr. Greg Meyers, Ph.D., P.Geo.,*** *Vice President Business Development, Pacific North West Capital Corp.*

Wednesday, November 4, 2009, 2:00 - 5:00 p.m.

EXPLORATION PROJECT HIGHLIGHTS

Session Chair: ***Curt Freeman****, Avalon Development Corporation*

IN THE HOLE

Curt Freeman

Avalon Development Corporation

MILLROCK CORPORATE UPDATE

Greg Beischer and Phil St. George

Millrock Resources

2009 EXPLORATION UPDATE: ILLINOIS CREEK MINING DISTRICT, KAIYUH MOUNTAINS, WESTERN ALASKA

Kit Marrs

A. W. Marrs, Inc.

The Illinois Creek Mining District, discovered in 1980, contains a significant number of precious and base metal deposits and prospects. The District is located in the Kaiyuh Mountains of western interior Alaska approximately 60 miles south of Galena and 18 miles east of the Yukon River, near village of Kaltag. Initial discoveries in the District were made by the Anaconda Minerals Company in 1980 and included the Illinois Creek Au-Ag and the Round Top porphyry Cu-Mo deposits. In 1982 the Honker Au-Ag deposit was discovered. Historical mineral occurrences include the Bishop Creek (Perseverance) Lode Ag-Pb mine near Galena (its namesake) and the Camp Creek gold placer mine located 16 miles north of Khotol Mountain.

HISTORY AND PREVIOUS WORK Anaconda Minerals Company discovered three large surface gossan exposures near the Round Top VABM by in 1980. The gossans are exposed along the contact of an altered mineralized porphyritic intrusion with Paleozoic quartz muscovite schist. Initial assay results from the gossan contained values of 0.49% Cu, 2.4% Pb, 1.3% Zn, and 4.3 opt Ag. Later that season, the Illinois Creek surface gossan was discovered. A major exploration program was initiated in 1981 that included diamond drilling, geologic mapping, and geochemical/geophysical programs at both Illinois Creek and Round Top. Illinois Creek was placed into production in 1997 and operations continued until 2001 when it was closed due to low gold prices.

A period of intense exploration occurred between 1981 and 1984 that included the construction of a 50-man camp, a 4200 foot C-130 Hercules/DC-6 capable airstrip and discovery of five additional deposits and prospects in the Illinois Creek "Belt". This included the Waterpump Creek deposit that contains a resource of 183,000 short tons of 9.5 oz/ton silver, 16.1% lead and 5.5% zinc. Outside of the Illinois Creek "Belt" two new structurally controlled Ag-Pb-Zn prospects, Tim's Gossan and TG North, were discovered adjacent to the Round Top porphyry deposit. Four new precious metal prospects were discovered near the Khotol Mountain pluton, most notably the high grade Honker Au (As-Ag-Cu-Pb) mineralized structure. It is located 6 miles north northwest of the Illinois Creek Mine. Surface samples at Honker contained gold values up to 1.4 oz/ton gold and averaged 0.13 oz/ton gold. From 1981 to 1984 over 179 exploration drill holes were completed in the District for a total of 76,850 feet. Extensive geochemical sampling and both ground and airborne geophysical surveys were also completed. Total District expenditures through 1984 totaled $10.5 million.

REGIONAL GEOLOGY The south-central Kaiyuh Mountains are a subdued mature range of rolling hills and meandering rivers. The entire region lies south of the Kaltag Fault, a major north-east trending strike slip fault with right lateral offset of up to 100 km. Topographic expression along the fault indicated that some recent movement has been dip-slip. Many topographic linears in the Kaiyuh Mountains are interpreted to be parallel fault splays or otherwise related to this structure. The Kaiyuh Mountains are comprised of three distinct geologic terrains: 1) an older lower Paleozoic schist terrain of quartz-muscovite, quartz-chlorite and quartz-muscovite-biotite pelitic schist interbedded with quartzite, dolomite and carbonate units; 2) a Jurassic sequence of mafic intrusive rocks which include gabbro, basalt and diabase, mafic volcanic rocks, and undifferentiated sediments which include shale, graywacke and chert; and 3) intrusive rocks which include a Cretaceous granodiorite/quartz monzonite (Kgr, 110 m.y.) around Khotol Mountain and Early Tertiary (72.9 m.y.) felsic intrusives at Round Top.

ROUND TOP The Round Top porphyry system is composed of two distinctive Late Cretaceous to Early Tertiary felsic intrusives hosted by a Paleozoic quartz mica schist. Age dating returned an age of 74 +/- 2.8 Ma. The "East Lobe" is underlain by a biotite quartz monzonite porphyry that hosts an extensive mineralized hydrothermal alteration system centered around an intense quartz vein stockwork. A coarse grained quartz feldspar porphyry is included in this unit. The "West Lobe" is underlain by a controversial rock type designated "Quartz Latite Fragmental". It contains quartz fragments and phenocrysts, feldspar phenocrysts, and abundant lithic fragments in a porous "cement-like" groundmass that is intensely altered to quartz-sericite. The unit is interpreted as a late, sub-volcanic explosive/hydrothermal breccia. Numerous dacitic and quartz latite dikes crosscut both the intrusive units.

Surface geologic mapping and geochemistry along with subsurface intercepts in drill holes indicate the existence of a large copper-molybdenum system centered on the oval-shaped "pipe like" quartz stockwork zone, 200 meters in diameter, in the East Lobe. An outer lead-silver zone flanks this central zone. Supergene chalcocite enrichment has been intersected by drilling in both the quartz monzonite porphyry and associated intrusive breccias. Copper-silver bearing semi-massive garnet skarn is an important mineralization target. Although only partially mapped at present, the known area of alteration and mineralization extends 1,000 meters east-west and 1,500 meters north-south. The principal host rock is the quartz monzonite porphyry and the coarser grained quartz feldspar porphyry.

Mineralization and alteration appear to be centered on the quartz stockwork veins and breccia and include Quartz-molybdenum veins and a tight, well developed molybdenum geochemical high. Tungsten, as scheelite in quartz veins, is concentrated about 200 meters out from the quartz stockwork. A copper zone, as defined by soil geochemistry, occurs between 250 and 700 meters outward from the quartz stockwork zone. This area is untested by drilling. A well-developed silver-lead-copper zone occurs between 800 to 900 meters outboard of the quartz stockwork zone along the southern and eastern edge of the East Lobe. This classic zoning pattern could produce a significant lead-silver vein system or a copper-silver replacement target hosted by quartz mica schist at the porphyry contact. Discovery drill hole RT-2 (1981) tested the northern contact of the West Lobe and intercepted three zones of significant copper mineralization that ranged between 0.98 and 1.82% Cu over thicknesses of 4.3 to 7.3 meters. Drill hole RT-7 (1981) was the single deep test of the East Lobe and associated quartz stockwork/quartz-feldspar porphyry. This drill hole cut an 18.6 meter thickness of supergene chalcocite enrichment that averaged .48% Cu. Five additional mineralized zones of 4.3 to 36.6 meters in thickness were hosted in quartz stockwork and quartz feldspar porphyry. Skarn mineralization within schist horizons was intersected near the bottom of the hole at 494.3 meters. Copper values ranged between 0.36% Cu at 227.4 meters and 1.1% Cu at 370.6 meters of depth.

ROUND TOP TARGETS The Round Top porphyry Cu-Mo system is a drill ready prospect with multiple follow-up and step-off targets including; 1) a large porphyry Cu-Mo system south of the East Lobe is defined by a pronounced aeromagnetic high anomaly, 2) a hydrothermal high grade Cu breccia target at the East Lobe 3) Cu-Ag-Pb-Zn skarn based on both surface outcrop and sub-surface intercepts in RT-2 and 4) a chalcocite enrichment blanket associated with leached porphyry copper mineralization. Round Top can be connected to the Illinois Creek airstrip by an approximately 15 mile road on contour.

HONKER GOLD The Honker Au-Ag mineralized structure was discovered in 1982 during detailed district-wide reconnaissance that identified a 5 meter by +400 meter zone of mineralized gossan rubble near the southern margin of the Khotol Mountain pluton. A second mineralized and highly silicified structure Honker West is located 250 meters west of the main discovery site on Hill 1810. Fourteen surface rock chip samples average 0.15 oz/ton Au (high of 0.55 opt) and 0.34 oz/ton Ag (high of 3.62 opt). Surface rock samples contained values up to: 1.48 oz/ton Au, 1.9 oz/ton Ag, and 5,400 ppm Cu. The Honker structure was explored with 1,001 meters of diamond drilling in 10 drill holes in 1982. Surface exposures and interpretation of the drill intercepts indicate that mineralization occurs in structure that is up to 25 meters wide. Mineralization consists of lensoid sub-vertical quartz-arsenopyrite veins within a larger envelope of gossanous brecciated wallrock that contains fragments of quartz-arsenopyrite and gossan/massive sulfide. It is open in both directions along strike and down dip. Two large bulk samples (160 lb. each) of surface sub-cropping vein material from the Main Structure were sent to Anaconda's Tucson metallurgical laboratory (1982) for testing using a column heap leach method. The bulk sample assay averaged 0.85 oz/ton gold and 0.86 oz/ton silver respectively and the average simulated heap leach recovery was 82% gold 63% silver. Agitated leach recovery was 92% and 72% respectively at a nominal -100 mesh grind.

HONKER TARGETS The Honker and Honker West prospects have excellent exploration potential for a high-grade Au-Ag deposit of 1,000,000 tons located within multiple en echelon structures with grades of 0.4 to 1.0 oz/ton Au. Drilling has indicated localized gold bearing replacement deposits adjacent to the ore controlling structures. The two known structures are both open along strike and down dip. Honker West has not been tested by drilling or trenching. Four or five additional structures are likely to be discovered given the lack of outcrop and extensive cover as indicated by ground geophysical survey and mineralized boulder trains on the surface. Column heap leach tests indicate excellent gold and silver recoveries and the coarse gold grain makes the deposit amenable to gravity separation. The Honker deposit can be connected to the Illinois Creek road system by an 8 mile road located on contour without any water crossings.

HIGH-GRADE STRUCTURALLY CONTROLLED GOLD VEINS AT GANES CREEK, OPHIR MINING DISTRICT, SOUTHWESTERN ALASKA

Jesse C. Grady, MSc

Yukuskokon Professional Services, LLC.

The Ganes Creek property, owned and operated by Clark-Wiltz Mining, is located 25 miles west of the town of McGrath in west-central Alaska and is a part of the historic Iditarod/Ophir Mining District. Ganes Creek and its tributary drainages are renowned for the rich gold placers and the abundant large cobble-sized quartz + gold nuggets (up to 122 ounces) mined from alluvial gravels for over 100 years. The Ganes Creek property is currently not being explored and is open for option or lease agreement.

Exploration for the lode source of the Ganes Creek placer gold has been ongoing and is problematic due to: 1) overburden that obscures bedrock geology, 2) extensive alluvial placer deposits, and 3) placer gold that is derived from common, small extensional and fault-fill veins that occur in various host rock lithologies.

Great Basin Gold Ltd. (GBG) explored the Ganes Creek property during 2007-2008 before abandoning the project in 2009. The work consisted of:

1) Compilation of data from six separate exploration groups dating back to 1988.

2) ~32,161 meters (19.98 miles) of trenching and continuous chip sampling of trench ribs/floors.

3) A total of 83.6 line kilometers of ground geophysical surveys (IP= 31 ln kms; TMF= 45.6 ln kms; HLEM= 6.9 ln kms).

This program resulted in a more clear understanding of the criteria responsible for the emplacement and signatures of high-grade mineralization. The current geochemical and geological database for the property contains 3,847 soils, 1,167 select rock samples, 4,400 continuous chip samples, and 2,381 drill core samples.

Prospects and General Geology

During 2007, two prospects were excavated that contained high-grade veins (Independence Mine and South Potosi Ridge). Both prospects occur within the cores of major NE-SW striking regional antiforms within Cretaceous Kuskokwim Group Flysch. The antiforms that host the prospects exhibit vertical thickening of hinge zones by chevron folding and high angle faulting as a result of sub-horizontal NW-SE contraction, and hinge sub-parallel attenuation associated with bedding parallel shearing and strike slip faulting where maximum stretching axes (and slip indicators) commonly plunge shallowly either NW or NE. In extreme cases of attenuation, cores to regional antiforms are deformed into brittle mélanges.

The prospects are spatially associated with NE-SW striking Cretaceous bi-modal (mafic + felsic) intrusive sill/dike swarms, and to a greater extent with older, folded and faulted early biotite-granodiorite and aplite sills. At both localities intrusive swarms have been offset by numerous NNW to NNE high angle normal faults and joint sets, as well as margin parallel dip slip faults with minor apparent left lateral displacement.

The prospects contain extensional and fault-fill quartz-carbonate veins that have been emplaced along pre-existing structures. Most veins are characterized by a mineral paragenesis of: early iron-carbonate along vein margins followed by clear-to-bull quartz ± carbonate. Occasional late stage quartz + iron-carbonate + sericite + free gold (massive or disseminated) occupy the centers of multi-stage extensional and fault-fill veins. Veins with wall rock alteration halos are not always observed. Field data indicate that at least some of the extension veins preceded fault fill veining, and was synchronous with some alteration, and/or that changing extension axes produced oblique dilation, throttling, and brecciation along extensional vein structures. Disseminated pyrite, arsenopyrite, and arsenopyrite-pyrite intergrowths occur in very low abundances within vein gangue and wall rock. Rare chalcopyrite, galena, and chalcocite are only found in high-grade gold veins.

High grade vein samples from these prospects include:

1) A single fault-fill quartz-carbonate breccia vein (~2” wide and exposed for ~6 meters along dip) produced samples ranging from 592ppm to 2140ppm Au. This vein was excavated beneath existing roads at the historic Independence Mine, which is hosted in a complexly deformed intrusive sill swarm located within the Yankee/Ganes Creek shearzone.

2) A newly discovered, intensely faulted and veined mafic sill swarm along the South Potosi Ridge produced two (2) samples with 14ppm Au from quartz-carbonate veins hosted within mafic sills, and post intrusive brittle shearzones separated by ~90 meters along strike.

Other important geological observations include:

Geophysics

- 3D modeling of gridded IP geophysical surveys near the Independence Mine indicate a large chargeability high adjacent to the Independence vein system. Drilling and trench sampling within the anomaly indicate that the anomaly is a function of host rock lithology and the occurrence of base metals (55-120ppm Cu, 75-110ppm Ni, 10-18ppm Pb, 150-200ppm Zn), with rare high silver values (146ppm Ag).

- Other chargeability highs exist across the property but have yet to be modeled in 3D and demand re-evaluation.
- Resistivity data prove to closely define bi-modal intrusive swarms.
- Ground Magnetic highs correspond well with felsic intrusives while magnetic lows correspond with massive silicification and brecciation.

Placer Nuggets/Gold Vein Quartz

- Recently detected placer nuggets that have wall rock attached indicate that multi-stage extensional veins hosted in altered mafics and flysch-hosted, fault-fill veins and vein structures that have a cockade texture are the source to some of the larger placer nuggets.
- Petrographic observations of the textural relationships between gold and quartz from placer gold samples indicate that gold and quartz are syngenetic. Multiple phases of quartz exist and remain to be discriminated.
- All placer quartz-gold nuggets and gold vein samples contain abundant fluid inclusions in quartz. Additional research could constrain absolute temperature, pressure, and chemical conditions of the fluids responsible for mineralization of Ganes Creek placer gold.

RARE EARTH ELEMENT EXPLORATION, BOKAN-DOTSON RIDGE PROPERTY, SOUTHERN PRINCE OF WALES ISLAND, ALASKA

Harmen Keyser, et. al.

Rare Earth One/Landmark Alaska

MAGMATIC NI-CU-PGE IN MAFIC-ULTRAMAFIC INTRUSIVE CONDUITS TO A TRIASSIC FLOOD BASALT PROVINCE: NYCON RESOURCE’S FAREWELL DISTRICT PROJECT, SOUTHWESTERN ALASKA

Robert A. Brozdowski and Stephen R. Taylor

Nycon Resources, Inc.

The Farewell District is located ~250-km northwest of Anchorage, Alaska. Late Triassic olivine-gabbro to peridotite intrusions, with hornfels and calc-silicate thermal aureoles comparable in thickness to the intrusions themselves, represent feeder conduits to locally-preserved overlying tholeiitic basalt. The mineralized intrusions, dominantly olivine-pyroxenite with olivine-gabbro tops and peridotite bases, intrude Ordovician silty limestone and Silurian sulfidic black shale.

The Roberts PGM Prospect comprises a variably-oriented, anastamosing dyke- to sill- like body of olivine gabbro to peridotite ~430-m in exposed strike by ~50-m thick. Its magnetic expression and drill results to date suggest that it dips steeply west overall. At the south end of the intrusion a 50-m long by 25-m thick peridotite trough hosts basal near-massive magmatic pyrrhotite-chalcopyrite-pentlandite sulfides. A 0.46-m rock chip sample taken at the base of the intrusion perpendicular to the contact with the hornfelsed shale and calc-silicate altered limestone assayed 2.27% Ni, 1.31% Cu, 8.03 ppm Pt and 7.64 ppm Pd (16.88 ppm Total PGE, with Ir+Os+Rh+Ru included), and another similar 0.61-m rock chip sample nearby assayed 2.32% Ni, 2.30% Cu, 6.30 ppm Pt and 5.74 ppm Pd (13.22 ppm Total PGE with Ir+Os+Rh+Ru included) . Disseminated to blebby magmatic sulfides at a higher level within the intrusion, based on limited drilling to date, included 8.4-m @ 0.67% Ni, 0.32% Cu, 0.94 ppm Pt and 1.07 ppm Pd.

The target model at Farewell is a mafic-ultramafic intrusion-hosted Ni-Cu-PGE magmatic sulfide deposit within a magma flow-through feeder conduit to the basalt. Several undrilled targets within a ~2-km E-W x ~3-km N-S area to the south of the Roberts PGM Prospect include magnetic anomalies, EM conductors and rock-chip Ni-Cu-PGE anomalies in mafic-ultramafic cumulate rocks with thick zones of hornfels & calc-silicate thermal alteration indicating extensive magma flow-through, and are interpreted to represent different parts of a mineralized dyke- and sill- conduit system. This overall target area is located within an anomalously northerly-trending segment along the otherwise northeasterly trend defined by most of the mafic-ultramafic intrusions in the region, to the southwest in the Gargaryah Hills and to the northeast in the Sheep Creek area.

An elongate Bouguer gravity high encompasses the overall regional swarm of Triassic dyke- and sill- form intrusions and remnant basalt, and suggests focused voluminous input of dense mafic magma into the crust. The presence of strongly elevated PGE including Ir, Os, Rh & Ru implies rapid ascent and emplacement of a magma representing a high-degree partial melt. Pt + Pd concentrations in the region correlate strongly with Ni + Cu across the entire range of concentrations encountered. The region comprises a Triassic large igneous province emplaced through older sulfide-bearing shales, with mantle-tapping structures interpreted from gravity and magnetic data.

A highly contaminated, xenolith-rich Early Tertiary gabbro-diorite dyke at the Chip-Loy Prospect to the southeast of the Roberts PGM Prospect also contains Ni- & Cu- bearing massive magmatic sulfides, representing an additional target type on the property. Grab samples from the Chip-Loy prospect returned up to 2.7% Ni & 0.4% Cu, but only 20 ppb Pt +Pd, and initial drill results include 1.07% Ni & 0.31% Cu over 2.74-m.

Nycon Resources Inc. holds a block of 164 State of Alaska Claims covering the main mineralized area plus 4 additional claims on other regional prospects, as well as a proprietary database of diamond drill results, geochemistry and two separate airborne geophysical surveys (Dighem & Aerotem) totaling 195 square kilometers. Other regional targets are ranked considering: Ni, Cu, PGE, Mg, and Cr concentrations in rock chip and stream sediment samples; olivine, Cr-diopside and chalcopyrite concentrations in heavy mineral concentrate samples; EM conductors and discrete RTP magnetic anomalies from Aerotem & Dighem surveys; and the presence, volume and composition of ultramafic and mafic intrusive rocks.

THE LIK DEPOSIT – AN UPDATE

Joe M Britton

Zazu Metals Corporation

The Lik Deposit is a 25+ million ton, sediment hosted zinc-lead-silver deposit located in northwestern Alaska, approximately 600 miles northwest of Anchorage and approximately 12 miles northwest of the Red Dog Mine. The Lik Deposit is located on 296 unpatented federal and 47 State of Alaska MTRSC mining claims.

The Lik Deposit was originally discovered in 1977 by WGM, Inc. as the operator of a joint venture between GCO Minerals Company (GCO) and Houston Oil & Minerals Exploration (HOMEX). In 1998 Teck purchased the HOMEX interest and in 2007 Zazu Metals Corporation purchased GCO's interest. Currently Zazu and Teck are

50/50 joint venture partners on the property with Zazu having full operational control and the option to acquire an 80% interest in the property through additional expenditures.

The Lik Deposit occurs as a conformable series of stratiform lenses of fine-grained marcasite/pyrite, sphalerite and galena in the carbonaceous and siliceous black shales and cherts of the Ikalukrok unit of the Mississippian to Pennsylvanian Kuna formation. This geologic environment is essentially the same environment in which the Red Dog deposits are found. On the property the host rocks and the mineralization strike roughly northerly and dip generally 25^o to 40^o westerly. The deposit is cut, most notably, by the Main Break Fault which separates the deposit in to the Lik South and Lik North deposits. The Lik South portion of the deposit contains the bulk of the present resource and is relatively shallow and generally amenable to open-pit mining. The Lik North portion of the deposit is relatively deeper and plunges under steep terrain. The deposit is open to the north and extends off the property to the south on to Teck's SU claim block.

The location of the Lik Deposit, only 12 miles from the Red Dog Mine, should allow the future development of the Lik Deposit to benefit from infrastructure and services that already exist in the area as a result of the Red Dog Mine development. Infrastructure and services that are currently available in the area includes the DeLong Mountains Transportation System (DMTS), a State of Alaska owned road and port that currently provides access and concentrate shipping for the Red Dog Mine, many contractor services that could be expanded to service a Lik development, and a skilled and knowledgeable local workforce.

Zazu Metals has aggressively moved the Lik Project forward since purchasing the property in 2007. Zazu has added significantly to the drill hole database by drilling 69 new drill holes on the property resulting in a total of 204 drill holes. This new drilling has allowed Zazu to obtain an updated NI43-101 compliant resource estimate for Lik of:

- Indicated Resources – 20.66 million tons grading 8.08% Zn, 2.62% Pb and 1.54 oz/t Ag
- Inferred Resources – 7.07 million tons grading 9.10% Zn, 3.03% Pb and 1.39 oz/t Ag

for a total indicated and inferred resource of 27.73 million tons. This resource shows the Lik Deposit to be one of the largest undeveloped zinc deposits in the western world.

In addition to the drilling Zazu Metals has initiated metallurgical studies, environmental studies to support necessary permitting, road access studies, a port capacity study and a scoping level Preliminary Assessment Study. In particular, the metallurgical studies have shown that the Lik mineralization is amenable to standard Pb-Zn flotation with zinc recovery at 87% and Pb recovery at 70% producing marketable concentrate grades. All of these studies are on going.

SUMMARY OF DOYON'S MINERAL HOLDINGS

John Woodman

Doyon, Limited

CHANDALAR PLACER GOLD OPERATION RESULTS

Jim Barker

Goldrich Mining

Thursday, November 5, 2009, 8:00 - 11:00 a.m.

AMA SESSION – ISSUES AFFECTING ALASKA MINERS

*Session Chair: **Greg Beischer**, President, Alaska Miners Association*

YUKON OVERVIEW

Mike Burke

Yukon Geological Survey

Canadian mineral exploration activity in 2009 was markedly reduced in comparison to the heightened activity of the previous 3-5 years, a direct reflection of unfavourable market conditions associated with the global economic recession. A notable contrast in nationwide trends is the vigorous exploration activity occurring throughout the Yukon Territory, a region renown for its' historical gold placer and bedrock production. With the price of gold breaking the $US1000/oz mark, and the gradual upward trend of gold prices since April this year, the search for new gold targets in the Yukon became an increasingly attractive exploit during the 2009 exploration season, particularly in light of the new bedrock discoveries, **Underworld Resources Ltd., Whitegold** property, south of Dawson City and **ATAC Resources Ltd**, **Rau** property, 50km NE of Keno City. Additionally, **Victoria Gold Corp.** on the **Eagle Zone** (Dublin Gulch) has commissioned a prefeasibility study and a comprehensive project proposal to move closer to open pit production of the 2,690,400 oz. indicated resource. Although Yukon exploration activities occurred throughout the classically known 'Tintina Gold Belt', the area of most intense interest was and continues to be the grossly under-explored Dawson Ranges.

The Dawson Range Mineral Belt in west-central Yukon has historically been recognized as 125 kilometre northwest-trending corridor of mineral deposits from the Mt. Nansen epithermal gold-silver deposit in the southeast to the Casino porphyry copper-gold-molybdenum deposit to the northwest. The 2008 discovery of the White Gold property has extended the belt a further 50 kilometres to the northwest and a number of additional gold occurrences continue along the trend a further 75 kilometres to the Yukon-Alaska border. If one follows this same general trend the Pogo deposit is encountered in Alaska approximately 125 kilometres from the border. Mineralization styles within the Dawson Range Mineral Belt consists of porphyries, epithermal veins and breccias, skarns, structurally hosted veins and breccias to name a few, plus placer gold deposits in many of the creeks draining the belt.

Gold is not the only commodity of interest in Yukon it is just capturing the lions share of the attention. **Capstone Mining Corp**., continues to conduct exploration at the **Minto Mine** in an effort to expand the resource base. They have been extremely successful with the discovery of the Minto North deposit located approximately 500 metres away from the existing open pit operations. Drilling at Minto North has produced the highest grade intersection ever from the project, 16.8 metres grading 5.87% Cu, 2.6 g/t Au and 24.2 g/t Ag. Drilling of other zones on the property continue to confirm and upgrade resources. In the Keno Hill district **Alexco Resource Corp** has been conducting extensive work including underground development and drilling at the **Bellekeno** deposit to upgrade resources at the historical producer in order to make a production decision. Resources at the start of the season stood at an inferred resource of 517,000 tonnes of 1,016 grams per tonne silver, 13.5 per cent lead and 10.7 per cent zinc, exploration results from the summer drilling program continue to produce excellent results. Alexco also received a positive screening report subject to specified mitigation measures from the Yukon Environmental and Socioeconomic Assessment Board, a key step in bring the mine closer to production.

Last but not least in what is turning out to be an excellent year in Yukon is the mine development work being conducted at the **Wolverine zinc-silver-copper-lead-gold Mine** of **Yukon Zinc Corporation**. Substantial work has been completed on the lined tailings impoundment, industrial complex, road and underground mine workings. Production at Yukon's next mine is on track for the 3rd quarter of 2010.

MINE SAFETY IN ALASKA

Sam Reves

Mining and Petroleum Training Service (MAPTS)

GLOBAL WARMING POLICY: HAS THE TRAIN LEFT THE STATION?

Paula Easley

Advocate for Economic Development

Just as Americans begin paying attention to the debate over whether and to what extent manmade carbon dioxide emissions have influenced global climate and what should be done about it, congressional leaders have declared, "It's too late. The scientific consensus is indisputable - we have a global crisis, and we must act, now!"

This presentation describes the most successful, brilliantly conceived and executed political/environmental/ economic campaign ever known; it explains what "cap and trade" really means and names winners and losers in a high-stakes game; and it tells what Congress has in store for taxpayers. Fortunately for Alaska, some true heroes are mounting their steeds to save the day. Gun smoke over the OK Corral?

THE CASE FOR COAL

Brian Newton

Golden Valley Electric Association

This talk will look at the current and future outlook for coal on a statewide and national scale. Today, while coal is used to generate 50% of the electric power production in the US, coal is facing extreme scrutiny as local and national campaigns are attacking the use of coal as an energy source. However, despite the criticism, coal remains the fuel of choice for many electric utilities because of its physical and economic advantages. This may lead to an increase, not a decrease in use of coal in the future.

DISCUSSION OF PENDING LITIGATION, NUNAMTA AULUKESTAI ET AL V. DEPARTMENT OF NATURAL RESOURCES

J.P. Tangen

J.P. Tangen, Attorney at Law (P.C.)

Nunamta Aulukestai, through the Trustees of Alaska, has sued the State of Alaska, Department of Natural Resources challenging the constitutionality of certain practices concerning the issuance of Temporary Water Use Permits and Miscellaneous Land Use Permits. The initial allegations focus on Article VIII, section 10 of the Alaska Constitution which requires that state land and water resources be developed in a manner consistent with the public interest.

Although the litigation focuses on the way the Department of Natural has issued and administered certain permits regarding the Pebble Project; nonetheless, if successful, this case could have extensive precedential impact on all upland exploration activities and the availability and use of water in association with those activities. Among other anticipated impacts, MLUPs and TWUPs could become subject to new and extensive public notice requirements and best interest findings as a necessary prerequisite to their issuance, burdening all exploration activities in the state with significant additional delays and costs.

This presentation will walk through the allegations of the complaint, the response of the parties and the current status of the pending litigation.

Thursday, November 5, 2009, 12:00 - 1:30 p.m.

LUNCHEON

Speaker: ***Don Poirier****, Vice President Corporate Development, Hecla Mining Company*

Thursday, November 6, 2009, 2:00 - 5:00 p.m.

ALASKA EXPLORATION PROJECTS

Session Chair: ***Cullan Lester,*** *Full Metal Minerals*

GEOLOGICAL RELATIONSHIPS AND CONTROLS ON MINERALIZATION IN THE PEBBLE CU-AU-MO PORPHYRY DEPOSIT, ALASKA

James Lang, Keith Roberts, Mark Rebagliati, Gernot Wober

Pebble Limited Partnership

The Pebble Project is located in southwest Alaska, approximately 200 miles southwest of Anchorage and 17 miles west-northwest of Iliamna. The Project is managed by the Pebble Limited Partnership, a 50:50 partnership between a wholly-owned U.S. subsidiary of Anglo American plc and a wholly-owned affiliate of Northern Dynasty Minerals Ltd.

The Pebble deposit is one of the largest Cu-Au-Mo porphyry deposits in the world. Using a cutoff of 0.30% copper equivalent (CuEQ), the deposit has combined measured, indicated and inferred mineral resources of 9.1 billion tonnes which contain 72 billion pounds copper, 94 million ounces gold and 4.8 billion pounds molybdenum (for mineral resource definitions and details please refer to 43-101 technical reports by Northern Dynasty Minerals which can be found on www.sedar.com).

The oldest rocks in the Pebble district are upright, gently folded, Jura-Cretaceous andesitic siltstone and sandstone with lesser interbedded mafic volcanic rocks and associated gabbroic intrusions. Compositionally diverse alkalic intrusions and related breccias formed between 99 and 96 Ma. Subalkalic granodiorite of the Kaskanak batholith was emplaced at about 90 Ma, along with smaller granodiorite stocks which have a spatial and at least partial genetic relationship to Cu-Au-Mo mineralization which Re-Os ages on molybdenite date at about 89 to 90 Ma.

The Pebble deposit comprises the contiguous East and West Zones which may represent two fluid and thermal centres within a single, large magmatic-hydrothermal system. The West Zone extends from surface to about 1600 feet depth and is centered on several small granodiorite plugs emplaced into andesitic siltstones, diorite and granodiorite sills, and alkalic monzonite intrusions and related breccias. The higher-grade East Zone extends to depths of up to 5500 feet within granodiorite of the East Zone Stock and in surrounding granodiorite sills and andesitic siltstones. The East Zone was partially eroded and is now concealed by an east-thickening wedge of Late Cretaceous to Paleocene volcanic and sedimentary rocks. On its eastern side, high-grade mineralization has been dropped 2000 to 3000 feet by normal faults which form the northwest boundary of the northeast-trending East Graben.

Variations in hypogene grade and metal ratios reflect multiple stages of metal introduction and redistribution. Early Cu-Au-Mo mineralization formed during one or more stages of widespread K-silicate alteration associated with multiple generations of quartz-sulphide veins. With depth, K-silicate alteration yields to lower-grade sodic-calcic alteration. Early copper mineralization is dominated by chalcopyrite and gold occurs mostly as inclusions in chalcopyrite. Illite alteration overprinted K-silicate and sodic-calcic alteration and variably redistributed copper and gold. The highest grade mineralization reflects an overprint by advanced argillic alteration controlled by a syn-hydrothermal brittle-ductile fault which cuts the East Zone. This overprint comprises a core of pyrophyllite alteration with high gold grades bounded by sericite alteration in which moderate enrichment in both gold and copper are related to a hypogene assemblage of bornite, digenite, covellite and minor enargite. Young quartz veins locally introduced additional molybdenum. Youngest, peripheral quartz-sericite-pyrite alteration yields outward to propylitic alteration. Supergene chalcocite and covellite mineralization rim hypogene chalcopyrite in the upper part of the West Zone but, in most cases, replacement is only partial.

UPDATE ON THE PALMER CU-ZN-AG-AU PROJECT AND THE UNTAPPED POTENTIAL OF THE ALEXANDER TRIASSIC VMS BELT, SOUTHEAST ALASKA

Darwin Green, Garfield MacVeigh, Wayne Livingstone

Constantine Metal Resources

Drilling by Constantine on its Palmer Cu-Zn-Au-Ag VMS project in 2009 has expanded the South Wall discoveries (2007/2008) both along strike and to depth. The South Wall includes 3 laterally extensive, subvertically dipping, stratigraphically stacked lenses of massive sulphide-barite mineralization. Step-out drill hole CMR09-23, the first of the 2009 drill season, intersected 21.3 meters of strong stringer and semi-massive sulphide mineralization grading 2.76% copper, 0.50% zinc with higher grade sub-intervals including 11.1 meters grading 3.86% copper and 0.50% zinc. This intersection extends South Wall Zone I mineralization 40 meters down dip of CMR08-17 (27.5 meters grading 2.52% copper, 3.38% zinc, 0.32 g/t gold, 25.5 g/t silver), the westernmost drill intersection in the 2008 drill program. Step-out hole CMR09-24 intersected 9.1 meters of massive sulphide and minor stringers grading 1.90% copper, 5.20% zinc, 0.30 g/t gold and 26.6 g/t silver, within a broader 18.7 meter wide zone of mineralization grading 1.16% copper, 4.16% zinc, 0.30 g/t gold and 29.2 g/t silver. The intersection expands South Wall Zone I, 80 meters west and 40 meters up dip of CMR08-17. A total of 10 holes were completed during the 2009 drill program with results available for only 3 holes at this time (September, 2009) all of which intersected significant sulphide mineralization.

The Palmer project is located in a very accessible part of southeast Alaska, with road access to the edge of the property and within 60 kilometres of the year-round deep sea port of Haines. It is one of multiple Late Triassic VMS occurrences that define a highly prospective and relatively underexplored metallogenic belt within the Alexander Terrane of southeastern Alaska and northwestern British Columbia that includes both the Windy Craggy and Greens Creek deposits. At 297 million tonnes Windy Craggy is the world's fourth largest VMS deposit by size, and tops the list as the largest of the copper rich (Besshi style) category of VMS deposits. At ~25 million tonnes grading 5.1% lead, 13.9% zinc, 5.61 grams per tonne gold and 706 grams per tonne silver Greens Creek is one of the world's richest VMS deposits (Galley et al, 2007). From a global targeting perspective, the Alexander Triassic metallogenic belt stands out as a premier VMS district to explore for both grade and size

To September, 2009, South Wall mineralization has been extended 380 meters horizontally along strike, and 315 meters vertically down dip. Excellent continuity of thick zones of copper-rich massive sulphide is demonstrated in drilling, including up to 5.1% Cu, 1.79% Zn, 0.29 g/t Au and 20.5 g/t Ag over 15.2 meters within a larger interval of 38.7 meters of 3.16% Cu and 3.6% Zn in CMR08-14. The South Wall with its three distinct stratigraphically stacked zones occurs on the steep limb of a large anticlinal fold, and is correlative with mineralization in the RW Zone that occurs on the shallow dipping upright limb of the fold where CMR07-7 intersected 14 meters of 3.79% Cu, 7.24% Zn. The presence of massive sulphide on both sides of the fold indicates a sizeable massive sulphide system, with zones on each limb offering excellent opportunity for further expansion.

Mineral assemblages reflect metal zoning; pyrite-pyrrhotite-chalcopyrite in massive sulphide lenses and stringers in the stratigraphic footwall to massive chalcopyrite-sphalerite-barite lenses up to 30 m thick, with peripheral barite and/or carbonate dominant sphalerite-chalcopyrite mineralization. South Wall mineralization occurs within a basalt dominated volcanic sequence that includes lesser amounts of rhyolite, and argillaceous and limy sedimentary strata, with a common association between baritic massive sulphides and rhyolite flows.

TINTINAGOLD RESOURCES INC. -- 2009 EXPLORATION AT COLORADO CREEK

Nathan Chutas, Doyle Albers, and Caleb Stroup

TintinaGold Resources Inc.

The Colorado Creek exploration project, operated by TintinaGold Resources Inc., lies near the Cripple Creek Mountains approximately 40 miles north of McGrath. Rosander Mining Co. currently mines placer deposits in this area which have produced an estimated >250,000 ounces of gold since the early 1900's. Previous exploration for a hard rock gold source identified a broad Au in soil anomaly that measures 5 km by 2.5 km that is open in at least three directions.

The TintinaGold 2009 program completed 2546 meters of core drilling in 12 drill holes at Porphyry Knob and in upper Eldorado Creek to cover a 1 km by 0.5 km area. This drilling showed that a quartz-feldspar rhyodacite porphyry at Porphyry Knob hosts significant gold mineralization as veins and as disseminated mineralization. Drilling also showed that intercalated porphyritic andesite and sediments above and below the rhyodacite also contain significant vein-dominated gold mineralization. Drill intersections through the rhyodacite include 0.64 g Au/t over 111 m, which includes 7.28 g Au/t over 2.3 meters and 6.38 g Au/t over 2 m. Another drill hole over 230 m away intersected 98.4 m of 0.54 g Au/t, which includes 1.01 g Au/t over 22 m.

Several distinct styles of alteration are present in the rhyodacite at Porphyry Knob: early pervasive sericite-dominated alteration, clay alteration, carbonate alteration, and a later clay-oxide alteration event. Altered rocks commonly contain minor to trace disseminated pyrite, with less common disseminated arsenopyrite needles. Mineralization includes 6 types of veins, and at least two host gold mineralization. Several different suites of elements are associated with elevated gold (one with high As, one with elevated Bi, and another with high As, Sb +/- Hg), and these indicate multiple gold events at Porphyry Knob.

Drilling in upper Eldorado Creek near the Cripple Creek diorite stock showed significant pyrrhotite-dominated sulfide replacement mineralization in hornfelsed sediment and veining in hornfelsed sediment and diorite and andesite dikes. This veining carries a quartz-carbonate-sulfide assemblage with pyrrhotite, chalcopyrite, pyrite, and arsenopyrite. Broad propylitic alteration, in addition to chlorite, sericite, and carbonate alteration are common in the in the upper Eldorado Creek area. The setting and mineralization style observed here show similarities to the Dome prospect north of the Donlin Creek deposit.

2009 EXPLORATION ON THE WHISTLER PROPERTY: DEFINING A NEW GOLD DISTRICT IN ALASKA

Jason Weber

Kiska Metals Corporation

Kiska Metals Corporation (KSK-TSX:V) is a newly formed company created from the recent merger of Geoinformatics Exploration Inc. and Rimfire Minerals Corporation. The driving force behind this new company is the advancement of the gold-rich Whistler copper-gold porphyry deposit and the exploration and definition of a new gold district centred around Whistler. The Whistler property is comprised of 450 km^2 of Alaska state mineral claims located 170 kilometers to the northwest of Anchorage in the Alaska Range. The Whistler property is host to three distinct styles of copper-gold and gold mineralization: 1) the Whistler copper-gold porphyry deposit and clusters of similar systems in the 18 by 9 km Whistler corridor, 2) the Island Mountain copper-gold porphyry system, and 3) the Muddy Creek Intrusion-Related gold system.

The Whistler deposit is currently defined by a NI43-101 Resource to contain a total Indicated and Inferred resource of 5.75 Moz Au-equivalent. Mineralization is hosted by Late Cretaceous diorite porphyry intrusive rocks emplaced into feldspathic sandstones of the Kahiltna terrane. The average grade of the Indicated Resource at Whistler is 0.87 g/t Au and 0.24% Cu, indicating that the Whistler deposit belongs to a unique class of gold-rich porphyry systems. The deposit remains open in several directions with potential to expand the resource through further drilling.

Several reconnaissance holes drilled previously by Kennecott and Geoinformatics targeted coincident magnetic and IP chargeability anomalies in the "Whistler Orbit", a 5 by 4 km area peripheral to the Whistler deposit and largely covered by glacial till. This drilling intersected copper-gold mineralization and alteration centres associated with high-level porphyry intrusions separate from the Whistler deposit (Raintree West: 160m @ 0.59 g/t Au and 0.10% Cu; Rainmaker: 152m of 0.37 g/t Au and 0.18% Cu, both in 2008). In addition, there are several other clusters of untested porphyry targets that occur up to 12 km to the north of the Whistler deposit, including Snow Ridge, Puntilla and Round Mountain, which share similar anomalous geochemical and geophysical features with the Whistler deposit.

This early reconnaissance work indicates that the Whistler deposit may only be one of a cluster of several porphyry systems and attests to the significant exploration upside potential of the property.

The Island Mountain copper-gold porphyry target occurs 20 km to the southwest of the Whistler Orbit and is comprised of a 4.5 by 3 km area of anomalous soil and rock chip geochemistry that hosts copper-gold bearing actinolite-albite-magnetite-chalcopyrite stockwork zones and breccias related to Whistler-like diorite porphyry intrusions. The Muddy Creek Intrusion-Related gold system is located 10 km to the north of Island Mountain and is defined by a 3 by 3 km area of anomalous gold-in-soil geochemistry and rock chip sampling related to gold-bearing sheeted pyrite-arsenopyrite-pyrrhotite veins hosted by younger 65 Ma monzonite and diorite intrusive rocks. Relative to the Whistler Orbit, Island Mountain and Muddy Creek are relatively untested raw prospects with significant potential.

Exploration by Kiska in the 2009 season aimed to evaluate the entire Whistler property by the execution of a 270 line-kilometer 3D IP survey covering most of the 18 by 9 km Whistler corridor, and 70 line-kilometers of reconnaissance 2D IP at Island Mountain and Muddy Creek. This survey was concurrent with an extensive geological mapping program, in-fill soil geochemistry surveys and rock chip sampling. In addition, three diamond drill holes tested three targets in the Whistler Orbit and two diamond drill holes tested two stockwork\breccia zones at Island Mountain. On completion of the inverted 3D IP dataset, a 5500 m program of diamond drilling in the Whistler corridor is scheduled to commence in March of 2010.

EXTENDING MINERALIZATION AT THE NIBLACK COPPER-ZINC-GOLD-SILVER VOLCANOGENIC MASSIVE SULFIDE PROJECT, SE ALASKA

Andrew Turner, P.Geol., Consultant

CBR Gold Corp.

The Niblack Project is a precious metal-rich VMS deposit located on Prince of Wales Island 27 miles southwest of Ketchikan. The mineralization at Niblack is characteristic of the Bimodal-Mafic group of VMS deposits typified by the Noranda and Flin Flon camp deposits. Mineralization is hosted within the 300-500 foot thick Lookout Rhyolite unit, which comprises felsic volcaniclastics and flows within a thick pile of mafic volcanic flows and tuffaceous units. The Niblack stratigraphy is overturned, south-dipping and exhibits minor folding with primarily southwest plunges. Underground drilling of the Lookout zone in 2008 confirmed the continuity of mineralization and recent modeling indicates at least four vertically stacked massive sulfide horizons with the two lowermost horizons, "L1 Contact Zone" and "L2 Mid zone", being the most laterally continuous. The last two holes of the 2008 program encountered high-grade mineralization in an area that had not been previously tested. Hole U27 intersected 26.6ft (8.11m) of 4.29g/t Au, 64.14g/t Ag, 1.85% Cu and 8.75% Zn, and hole U28 intersected 258ft (78.66m) of 4.83g/t Au, 85.31g/t Ag, 1.89% Cu and 4.93% Zn. The southwest extension of the Lookout zone remains open along strike and to depth.

Regionally, Niblack stratigraphy is part of the Craig subterrane of Alexandria that, together with Wrangellia, accreted to North America in Jura-Cretaceous time (Duke, 2008). On southern Prince of Wales Island, the Craig subterrane comprises Proterozoic Wales Group orthogneises and supracrustal rocks overlain by Ordovician-Silurian Descon Group sediments. The Wales Group generally exhibits amphibolite grade metamorphism dated at 484Ma whereas the younger Descon Group sediments are greenschist grade, similar to the Niblack stratigraphy. As a result, the Niblack stratigraphy is considered to be part of a package of rocks that is thought to be time equivalent to the Descon Group sediments, which has been referred to as the Moira Sound Unit (Karl, 2003).

Mineralization at Niblack was discovered at the head of Niblack Anchorage in the late 1800's and some 1,000,000 lbs of copper were produced from the historical Niblack Mine between 1902 and 1907 before a claim dispute halted production (Roppel, 1991). A number of companies have conducted exploration at the property since the 1970's and systematic exploration of the property has been ongoing since 2005 and has focused on the Lookout and Trio zones, which are located south of the historical Niblack Mine.

The last 12 months have seen some significant milestones in the advancement of the property. In June 2008, a 2775' exploration drift was excavated beneath the Lookout zone of mineralization to facilitate drill access to deeper portions of the mineralization where the final holes of the 2008 underground drill program intersected the high-grade western extension to the deposit.

In September 2008, the first 43-101 compliant mineral resource for the project was produced comprising 3.32M tonnes of Indicated and Inferred Resources (Niblack Mining Corporation press release, September 10, 2008). In March 2009 the resources were increased with the incorporation the 2008 underground drill holes that targeted the Lookout zone. The global resource was increased to 3.77M tonnes and the percentage of the resource within the "Indicated" category increased from 43% to 60% (CBG press release, March 26, 2009). Subsequently, metallurgical testwork showed increased base and precious metal recoveries and allowed for a second revision of the resource, which now comprises 4.3M tonnes of Indicated and Inferred Resources within the Lookout and Trio zones (CBG press release, July 9, 2009). The Niblack Mineral Resource currently comprises 2,588,000 tonnes of Indicated Resource grading 2.33 g/t Au**,** 33.18 g/t Ag, 1.18% Cu and 2.19% Zn and 1,712,000 tonnes of Inferred Resource grading 2.08 g/t Au, 32.56 g/t Ag, 1.55% Cu**,** and 3.17% Zn (based on a US$50 NSR block cut-off).

At the end of September 2008, the project was acquired 100% by Committee Bay Resources Ltd. of Edmonton, Alberta, Canada. In February of this year, Committee Bay reorganized and emerged as CBR Gold Corp ("CBG") and in June CBG entered into a Joint Venture with Heatherdale Resources Limited ("Heatherdale"), a company affiliated with the Hunter Dickinson group of companies based in Vancouver, British Columbia, Canada. Under the terms of the agreement Heatherdale assumed operatorship of the project and can earn a 51% interest in the property by completing US$15M of exploration over the next 3 years. CBG and Heatherdale resumed underground drilling at Niblack in late September 2009 with a 25,000 ft program.

PROJECT UPDATE ON THE MONEY KNOB GOLD DEPOSIT, LIVENGOOD DISTRICT, INTERIOR ALASKA

Russell Myers and Chris Puchner

International Tower Hill Mines Ltd

In 2009 the Livengood project was advanced by two drilling programs, one in the period February to April and the second from June through October. In total over 63,000 meters of RC and core drilling will be completed in 2009. A recalculation of the resource based on assays received to the 25th of September shows that the deposit now contains over 12 million ounces of gold at the 0.5g/t cutoff, nearly doubling the resource from January 2009 and making it one of the largest new discoveries in recent years.

October 2009 Livengood Resources (at 0.50 g/t gold cutoff)

Classification	Gold Cutoff (g/t)	Tonnes (millions)	Gold (g/t)	Million Ounces Gold
Indicated	0.50	297	0.85	8.1
Inferred	0.50	164	0.84	4.4

If there is one adjective that can summarize the Money Knob deposit it is “complex”. That complexity starts with the stratigraphy which consists of a complex array of sedimentary and igneous rocks of both continental and oceanic affinity. The interpretation of the stratigraphy is made more complex by a structural history which may involve two or more compressional events, normal faulting and finally strike-slip faulting. Superimposed into this structural complexity is a 90Ma dike swarm of strange alkaline rocks that range in composition from mafic to felsic and range in size from 10’s of meters to centimeters. Finally, there is the alteration and mineralization which appears to be synchronous with the dikes but has many stages representing the telescoping of the system from early hot, biotite-stable alteration through progressively cooler albite to sericite to illite and finally smectite-stable assemblages. It appears that gold may be associated with all of these stages of alteration.

Fortunately, the mineralization occurs relatively late in the structural history and is not dramatically dismembered by the complex deformation. Similarly, although there are some lithological controls on mineralization, the intensity of mineralization is such that it overwhelms virtually everything in the system creating broad zones of mineralization amenable to delineation with wide-spaced RC drilling.

The distribution of gold is intimately related to the Cretaceous dike swarm in the area; however, the mineralization is not restricted to the dikes. Most of the gold is associated with disseminated pyrite and arsenopyrite in zones of pervasive albite-silica or sericite-carbonate alteration. Higher grades are associated with the presence of quartz-sulfide and quartz-carbonate-sulfide veins in the zones of alteration. Fluid inclusions in gold-bearing quartz veins are low salinity high CO2 fluids. Overall the Money Knob deposit appears to represent a type of the reduced intrusion-related mineralization.

Thursday, November 5, 2009, 7:00 - 9:30 p.m.

HISTORY NIGHT

"Willow Creek Mining District"

MC: ***Curt Freeman***

INDUCTIONS INTO THE ALASKA HALL OF FAME: ORVILLE G. HERNING, ROBERT LEE HATCHER, BYRON S. BARTHOLF AND WALTER WILLIAM STOLL

Charles Hawley and Tom Bundtzen

Alaska Mining Hall of Fame

Friday, November 6, 2009, 8:00 - 11:00 a.m.

MODERN MINE RECLAMATION

Session Chairs: ***Delbert Parr,*** *Kinross Gold Corporation* **-** *Fort Knox Mine*

PLACER MINE RECLAMATION - STATE OF PRACTICE UNDER CURRENT REGULATIONS

Eddie Packee

Travis/Peterson Environmental Consulting, Inc.

Placer mining activity occurs primarily within the riparian zone of Alaskan streams and rivers. Mining activity results in drastic disturbance to the riparian zone including:

- Changed/altered geology;
- Removal/loss of vegetation cover; and
- Changed/altered stream hydromorphology.

The basic alterations of the environment by placer mining will be discussed. Restoration and reclamation approaches for mitigating environmental disturbances following placer mining will be indentified and discussed in terms of NPDES with an emphasis on storm water permitting under the Multi-Sector General Permit for Industrial activities.

DESIGNING FOR CLOSURE AT A MODERN PORPHYRY COPPER-MOLYBDENUM MINE: HUCKLEBERRY MINE, WEST CENTRAL BRITISH COLUMBIA, CANADA

Stephen Day

SRK Consulting (Canada) Inc.

Huckleberry Mine is located in west central British Columbia on the eastern flank of the Coast Mountains approximately 86 km southwest of the town of Houston. The orebodies were explored beginning in the 1970s. The project was environmentally assessed under the former provincial Major Projects Review Process over the period September 1994 to May 1997, came into production in 1997 and is currently scheduled to begin closure in the third quarter of 2010. It was designed and is being operated under the premise of “Designing for Closure”. The objective was to close the mine in a manner that minimizes the need for long term commitments to monitoring and management. This mine provides a good example of a modern operation that has successfully implemented relatively complex waste management measures to address potential for water quality effects throughout the mining cycle.

The mine produces chalcopyrite and molybdenite concentrates from calc-alkalic porphyry-style mineralization hosted by Jurassic andesitic volcanics intruded by Cretaceous age granodiorite. Mineralization resulted in potassic and propylitic alteration, which was accompanied by pyrite, calcite and gypsum as the mineralizing event progressed. Ore grade mineralization occurs in three zones: East Zone, Main Zone and Main Zone Extension.

Geochemical characterization of the host rocks and ore prior to mining demonstrated that significant components of the waste rock and all the tailings had the potential for acid rock drainage (ARD) and this needed to be considered when designing the mine. However, testing showed the presence of calcite would result in delay of onset of ARD by many years allowing flexibility in the implementation of waste management plans to address ARD potential. The same testing also showed that leaching under non-acidic conditions was limited due to the presence of relatively low levels of elements like arsenic, cadmium, selenium and zinc in the rock.

The ore body and all site facilities are located in a small valley which drains towards Tahtsa Reach (Figure 1). The Reach is part of a system of lakes created to provide water for a hydro-electric development that powers the aluminum smelter located in Kitimat.

The mine design incorporated several features that were designed to minimize acid generation potential and limit the footprint of the mine. The primary technology to mitigate ARD is subaqueous disposal but the mine also used segregation to minimize the quantities of potentially acid generating (PAG) material and the need for engineered structures to maintain flooded conditions. The three ore zones were mined in sequence as open pits providing voids for disposal of PAG waste rock and tailings. The Main Zone Pit was completed first and has been filled with PAG waste rock and incorporated into the tailings impoundment. The East Zone Pit was then completed and is being used for PAG tailings disposal. The Main Zone Extension Pit is being mined currently and will become an arm of the tailings impoundment. Waste rock was segregated for ARD potential using acid-base accounting (ABA) data generated by the on-site laboratory. All PAG waste rock is placed within the eventual flood level of the impoundment so that it will submerged. Non-PAG waste rock is disposed subaerially and was also used as the rock fill shell for the tailings impoundment dams. The tailings impoundment itself was constructed with a glacial till core so that PAG tailings will remain in a permanent saturated state. High pyrite cleaner tailings are disposed in the center of the impoundment where the eventual water cover will be deepest. Lower pyrite rougher tailings are spiggotted off the dams and form beaches. In order to create non-PAG beaches for closure, the final rougher tailings were de-pyritized prior to placement on the beaches.

Highwalls for the Main Zone Extension and East Zone Pits will remain at closure following flooding of the pits. The East Zone Pit east highwall failed in June, 2007 resulting in the permanent exposure of roughly 8.6 million m^3 of rock much of which is PAG. However, both highwalls are within the contained drainage area of the site allowing drainage chemistry to be monitored and managed as necessary to protect downstream water quality.

In conclusion, Huckleberry Mine demonstrates that it is possible to operate a relatively small open pit mine in an environmentally sensitive and remote area so that long term water quality can be protected both during operation and closure.

FINANCIAL ASSURANCE FOR LARGE MINE PROJECTS IN ALASKA

Rick S. Fredericksen

Alaska Department of Natural Resources

A financial assurance package, commonly referred to as a "bond", must be in place for all mining projects in Alaska to ensure that reclamation and closure of the operation can be completed, even if the operator goes bankrupt or is otherwise unable to complete those obligations. The dollar cost of the estimate for reclamation, closure, post closure monitoring and any required water treatment is tied directly to the mine's approved Reclamation and Closure Plan. These plans are typically updated every five years, usually upon completion of an environmental audit that is conducted on a similar schedule. However, the financial assurance amount can be recalculated or updated anytime that it appears to be inadequate – for instance, when fuel prices change rapidly. It can also be reduced for the same reasons.

Department of Natural Resources (DNR) reclamation standards apply to all state, federal, municipal, and private lands and waters that are subject to mining. The Department of Environmental Conservation (DEC) also has financial assurance requirements that are typically included with DNR's into a single package. The DNR and DEC also will work in concert with federal agencies to establish a joint bond that satisfies all of the agency requirements eliminating the need for the miner to seek a plethora of bond packages.

The procedure used to calculate the bond amount is free form and can thus accommodate a wide range of operations and locations. By statute (AS 27.19.040), the bond amount shall be determined by the Commissioner, and is not to exceed an amount reasonably necessary to ensure performance of the reclamation and closure plan. In practice, the operator commonly submits a detailed calculation that is reviewed by the agencies and after several rounds of discussions, the amount is revised to be acceptable to the agencies. The costs must reflect the substantial inefficiencies that will result from the State having to step into a situation where the mining equipment is not available for use, logistics may be difficult, and contractors must be hired to complete the reclamation and closure. The state requires quotes for equipment rentals, fuel, major consumables, and is typically required to use 'Little Davis Bacon' wages.

Bond amounts vary due to the size, nature, and location of the operation. Several types of assurance are allowed including cash, gold bullion, surety bonds, reclamation trust funds or irrevocable letters of credit. Surety bonds have become extremely difficult for operators to secure and most companies currently provide an irrevocable letter of credit.

In July 2009, EPA issued a notice identifying hardrock mining as the first class of facilities for which EPA will develop CERCLA financial assurance requirements. This is just the first step in the rulemaking process. Additional research, outreach to stakeholders, proposed regulations, review of public comments, and finalization of those regulations are needed before hardrock mining facilities are subject to CERCLA financial responsibility requirements. We hope the EPA will recognize the State's leadership on bonding and allow us some form of primacy.

RED DOG MINE, PLANNING FOR CLOSURE NOW BUT MANY PROFITABLE YEARS AHEAD

Jeffrey Clark

Teck Alaska Incorporated

The Red Dog zinc and lead mine is a joint venture between Teck Alaska Incorporated and NANA. The mine is located 96 miles north of Kotzebue in the Western Brooks Range. Cominco (now Teck) began mining the deposit in 1989 and it is anticipated that the mine will continue to operate until 2032. Even though there are 22 more years of mining left at Red Dog Teck has begun progressive reclamation and continues to conduct research into reclamation techniques applicable to arctic conditions.

Teck and NANA are hopeful that in late 2009 Red Dog will finally receive a new Reclamation and Closure Plan from the Alaska Department of Natural Resources and Solid Waste Disposal Permit from the Alaska Department of Environmental Conservation. Teck and NANA have been working with the State to developing these permits since 1999 and have involved as many stakeholders as possible in the process through public meetings and workshops. The new Waste Management Permit contains a requirement for a Monitoring Plan. Many of the voluntary monitoring programs presently carried out by Teck will now be required under this new permit. Since 1999 the financial assurance requirements for Reclamation and Closure Plan have gone from 11.1 million dollars to 304 million dollars.

Beginning in 1999 Teck began research into techniques that could be used in closure. Research was conducted on the native plants that could be used in revegetation, bactericides, (used to control sulfide oxidizing bacteria), cover material sources, cover systems and water treatment techniques. This research was in addition to the normal due diligence closure studies which included geochemical characterization, water balance, alternative tailings sites, alternative tailings closure methods, and alternative waste rock closure methods.

Why is Red Dog beginning reclamation activities now? Because of the high grade nature of Red Dog's sulfide ores, its waste rock also has high sulfide and metal values. If allowed to oxidize without controls these waste sulfides contribute large quantities of total dissolved solids (TDS) to the waste water treatment facility making it more difficult to treat this water prior to discharge to Red Dog Creek. Covers on waste stockpiles and proper water management will enable Red Dog to lower the TDS reporting to the treatment facility and allow it to discharge its annual accumulated precipitation to Red Dog Creek.

Red Dog is a long way from closure but it is never too early to plan for closure. I would encourage all new mines to plan for closure from the start.

GOLD RUN MINE, PROGRESSIVE RECLAMATION AND PARTIAL BOND RELEASE

Bartly Coiley

Usibelli Coal Mine Inc.

Friday, November 6, 2009, 12:00 - 1:30 p.m.

LUNCHEON

Speaker: ***Governor Sean Parnell***

Friday, November 6, 2009, 2:00 - 5:00 p.m.

DEVELOPMENT AND MINE OPERATIONS

Session Chair: ***Keith Walters,*** *Usibelli Coal Mine Inc.*

WALTER CREEK HEAP LEACH PROJECT - CONSTRUCTION & COMMISSIONING UPDATE

Johnny F. Blizzard

Kinross Fort Knox Mine

Project Overview

The Walter Creek Leap Leach project covers approximately 310 acres and will have a total capacity of 162 million tons. Ore for the heap leach consists of run-of-mine material from the Fort Knox Pit and existing mine stockpiles, and will be actively mined and placed through 2021.

The facility utilizes a 60 million gallon in-heap storage pond for the collection of pregnant solution. The in-heap pond design provides a heat sink, and helps insulate the leach solution from freezing.

Barren solution will be applied on the heap leach using drip emitters. Pregnant solution will flow to the in-heap storage pond and then it will be pumped to the CIC plant at a rate of 8,000 gpm.

The facility is being commissioned this fall. Flooding of the in-heap pond began on October 14th.

2008 Construction Overview

2009 Construction Update

CIC Building

The lines and pumps were tested in June 2009, tails water was used and pumped through the CIC circuit.

Liner

The bottom of the valley double lined pond was completed in August 2009 The overliner haulage commenced on the pond bottom and the side slopes. We are above the 1675 elevation currently.

Mine Haulage into the Heap

The mine haulage access ramp was developed down into the heap, and completed mid September. Two way mine truck traffic was established for the mine trucks.   The lime silo has been erected and is being commissioned. Operator training is ongoing.

1610 Ore Lift – Completed Early October

1640 Ore Lift – Completed end of October

2010 and Beyond:

Conceptual view of the leach pad's growth over the next few years.

Walter Creek Valley Heap Leach – October 14, 2009

THE POGO ONE MILLION OUNCE JOURNEY

Larry Davey

Sumitomo Metal Mining Pogo LLC

Pogo Mine celebrated a major milestone on October 6, 2009 when the millionth gold ounce was poured. The celebration of this event is not specific to the actual millionth ounce poured, but rather to the journey undertaken by Pogo to move from an Exploration Project to that of a fully operational and successful Gold Mining Operation.

The journey required significant improvement in multiple areas (Safety, Environment, People, Production and Costs) to attain credibility and meet targets. This presentation reviews the operational part of that journey and highlights some of the key changes required to become a successful operation.

MINING TRAINING SCHOOL AT HECLA GREENS CREEK MINE

Benjamin Gage

Hecla Greens Creek Mining Company

Underground mines in Alaska often face the challenge of finding and retaining skilled miners amongst the local workforce. The surge in metal prices in recent years exacerbated the problem as competition soared for the most skilled and experienced miners. To address this problem, Hecla Mining Company's Greens Creek Mine created and currently operates an in-house training school for developing the full range of underground mining skills for its workforce. The school was established in August of 2007 to promote local hiring of workers, reduce workforce turnover, and standardize good mining practices. The school has thus far graduated 11 miners with four trainees currently in the program. Since the inception of the school, the number of locally hired miners has increased by eight, which is of benefit to the operation as the turn-over rate at Greens Creek has historically been twice as high for miners hired from out of state. Mine operations has seen improvements in over-break, ore dilution, usage of consumables and equipment down-time. Greens Creek is pleased that the mine training school has achieved its original goals and intends to continue developing its mine workforce through the program in the years to come.

Greens Creek Mine is a wholly owned property of the Hecla Mining Company of Coeur d'Alene, Idaho. Greens Creek is a Ag-Au-Zn-Pb VMS-type deposit located in Southeast Alaska on the northern end of Admiralty Island, approximately 15 miles southwest of Juneau, Alaska. The underground mine started production in 1989 and currently produces 2200 tons per day. An on-site processing plant produces three concentrates – lead, zinc and bulk. As of December 31st, 2008, Greens Creek has ore reserves of 8,064,697 tons at .11 opt Au, 13.7 opt Ag, 3.8% Pb and 10.6% Zn.

RED DOG'S AQQALUK DEPOSIT – MINING THE NEXT 20 YEARS

James Kulas

Teck Alaska Incorporated

Red Dog is one of the largest zinc mines in the world. The mine is located in northwest Alaska, approximately 80 miles north of Kotzebue and 50 miles inland from the Chukchi Sea. Red Dog is operated by Teck Alaska Incorporated (Teck) under a 1982 Operating Agreement with NANA Regional Corporation (NANA). NANA is the landowner and Teck is the operator. The mine is an open pit operation. Conventional grinding and sulfide flotation are used to produce lead and zinc concentrate. With twenty years of mining behind it, Red Dog is about to embark on the development of the Aqqaluk Deposit.

Red Dog is viewed as the economic engine for Northwest Alaska. Since start-up in 1989 the operation has paid out $1.9 billion in wages, royalty payments and taxes. The operation provides over 580 well paying jobs and over 56% of the workforce are shareholders of NANA. Red Dog is the sole tax payer for the Northwest Arctic Borough. Over the life of the operation $83 million in the form of a payment-in-lieu-of-tax has been paid. Revenue to the NANA Regional Corporation totaled $212M in 2008. Under a provision in the Alaska Native Claims Settlement Act (ANCSA), NANA must share this revenue with other ANCSA corporations.

By 2011, ore in the Main Deposit will be exhausted. Containing 52M tonnes of ore, the adjacent Aqqaluk Deposit will allow for the continuation of mining for another 20 years. Red Dog has developed a reclamation and closure plan with input from regional stakeholders and local and state governments. The plan calls for backfilling of the Main Pit with waste from the Aqqaluk Deposit. The tailings pond will be managed as a clean water lake and all waste rock piles will be resloped, covered and revegetated. Treatment and discharge of site water will continue. Under state regulation, Red Dog will provide a $304M financial assurance package to guarantee funding for site reclamation and closure.

With EPA as a lead agency, a Supplemental Environmental Impact Statement (SEIS) has been developed for the Aqqaluk Extension Project. Initiated in May 2007, the SEIS also has the State of Alaska, Corps of Engineers, National Park Service, Northwest Arctic Borough and the Maniilaq Association participating as cooperating agencies. On October 9, 2009 EPA public noticed the completion of the SEIS. On November 9, 2009 we anticipate the agency will issue their Record of Decision and a renewed NPDES permit. A 30 day appeal period will follow. Contemporaneous with the SEIS process, the Corps of Engineers will provide wetlands permits, the State will issue a waste-management-permit and closure plan and the Northwest Arctic Borough will update their master plan.

COEUR ALASKA'S KENSINGTON PROJECT CONSTRUCTION UPDATE

Tom Henderson

Coeur Alaska

Coeur Alaska's Kensington Mine is currently completing final construction activities to commence production operations during the third quarter of 2010. Final work remaining includes completion of the Tailings Storage Facility, tailings pipeline, mill and crusher commissioning, and some remaining underground infrastructure work. Once in operation, annual production is scheduled to be 450,000 tons of underground ore and 120,000 ounces of gold in concentrate.

Friday, November 6 - 6:30 p.m.

Miners Banquet

U.S. Senator Ted Stevens*, featured guest and speaker*

Wednesday, November 4 – 8:00 am to 7:00 pm
Thursday, November 5 – 8:00 am to 5:00 pm
Friday, November 6 – 8:00 am to 2:00 pm

2009 TRADE SHOW

Sheraton Hotel

FREE AND OPEN TO THE PUBLIC

Friday, November 6 – 5:00 pm to 9:00 pm
Saturday, November 7 – 10:00 am to 5:00 pm
Sunday, November 8 – 11:00 am to 4:00 pm

ROCK AND MINERAL SHOW

Sheraton Hotel

FREE AND OPEN TO THE PUBLIC