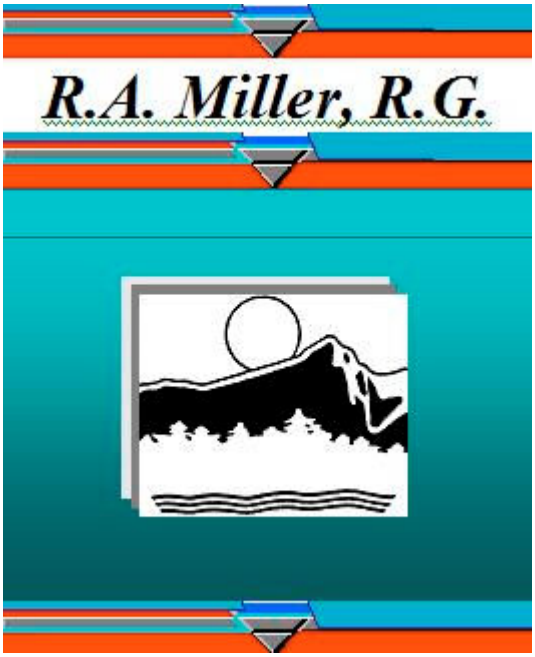
Statement of Qualifications to Provide Geological and Environmental Services to the Mining Industry



Geological Analysis
Exploration
Geochemistry
Environmental Planning
Environmental Characterization
Water Quality Monitoring
Materials Testing
Permitting
Reclamation
Risk-Based Closure

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COMPANY OVERVIEW

Fifteen years of experience has enabled R.A. Miller, R.G. to identify solutions to problems while meeting time and cost constraints faced by our clients.

The company has addressed mineral exploration and mining concerns in Alaska, Arizona, California, Montana, Nevada, New Mexico, and Mexico. Projects have incorporated the use of geologic mapping, remote sensing and global positioning systems (GPS), geologic characterization and geochemical analyses. Results were used to define exploration targets, delineate additional reserves, and provide reclamation and mitigation/remediation controls for proposed, active and abandoned minesites.

Exploration

We have used remote sensing, regional geologic reconnaissance mapping, geochemical analysis, and fluid inclusion techniques to identify exploration targets. GPS technology is available to download information in real time.

Southern Alaska

Remote sensing was conducted to explore for potential copper targets in southern Alaska (Figure 1). LandSat, magnetic, and geochemical information were used to highlight areas of gossan formation in mineralized areas of the Nabesna quadrangle. This project resulted in the discovery of three previously undetected porphyry copper targets.

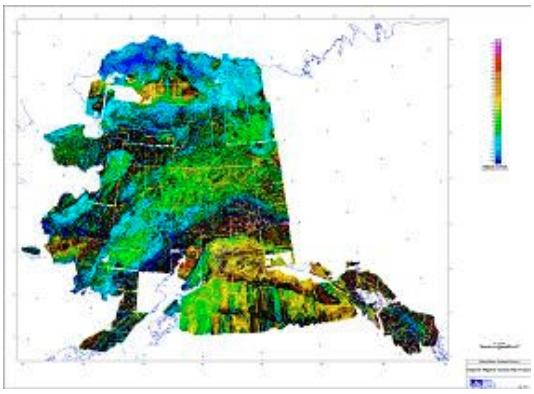

Figure 1. Alaska Statewide Magnetic Survey (USGS)

Southwest Chihuahua

Regional reconnaissance mapping in a very remote area of southwest Chihuahua, Mexico identified widespread quartz-vein occurrences radial to a nearby Tertiary porphyry intrusion. To help confirm the intrusion as the mineralizing source, over 100 quartz vein samples were collected and assayed.

When mapped, Au/Ag metal ratios increased in a uniform manner through three orders of magnitude towards the intrusion. This study resulted in the identification of widespread, ore-grade, precious metals, epithermal, fissure-vein mineralization in the Llanitos Mining District (Miller and Goodell, 1988). Results provided strong indication that the intrusion was indeed the source of mineralization.

Later, oversight of bulk sampling and metallurgical testing was provided for the Llanitos District. Contracts with the Mexican government and the ASARCO smelter in El Paso were negotiated to complete the underground bulk-sampling project.

Testing results indicated ore-grade silver mineralization with additional gold and copper values. These ores were found to be amenable to both conventional flotation and cyanide leaching processes.

These prospects have been submitted to various mining companies and are under consideration for further exploration. In addition, R.A. Miller, R.G. has formed joint venture partnerships with Mexican claim owners in order to develop mineral properties in northern Mexico. These efforts required fluency in Spanish at the level of contract and permit negotiation.

Mine Production

Using geologic and geochemical characterization, we have been instrumental in developing significant increases in reserves for various precious metals mining operations in the continental United States and Mexico. Responsibilities included supervision of drilling, evaluation of drill core, and rock quality designation. Projects included:

- the MacDonald Meadows Project located east of Lincoln, Montana,
- the Bullfrog Mine adjacent to Death Valley National Monument
- the Yellow Aster and Baltic mines located near the Mojave Desert, and
- La Verde Mine in a remote area of southwest Chihuahua.

Supervision of delineation and developmental drilling provided resource information instrumental in the discovery of significant reserves and definition of new, closely associated targets.

Mine Waste Characterization and Segregation

In order to provide an effective mine materials characterization and segregation program, an extensive geochemical testing program was developed for the Zortman and Landusky mines located in north central Montana (Figure 2).

Figure 2. Historic Ruby Mill with active cyanide heap leach pads in upper right background.

As a result of this study, significant transportation cost reductions were realized due to the decrease in waste handling requirements. The total volume of waste material necessary for salvage and reclamation was reduced by one third.

Geochemical Testing for the Zortman Mine Sulfide Expansion

Static and kinetic testing were used to characterize waste rock and ore that would be mined as a result of the expansion of the existing open pit at the Zortman Mine. We provided technical support in developing experimental static testing protocol and designing an array of bench-scale humidity cells.

Over one thousand waste rock samples were submitted to static testing. After initial acid-base screening, various materials were composited and a series of cells were constructed, charged, and leached (Figure 3). Static (Figure 4) and kinetic test results (Figure 5) for each cell were plotted and interpreted along with other geochemical data.

Figure 3. Humidity cells designed for kinetic testing, Zortman Mine.

Results helped identify acid generating and acid buffering materials so that these materials could be either disposed of properly or salvaged and stored for reclamation purposes (Miller and Hertel, 1997).

Later, personnel assisted in conceptual, preliminary, and final design for the pilot-scale column leach tests used to confirm preliminary laboratory testing. Five 10- x 10- x 20-foot cells were constructed at the minesite and natural precipitation was allowed to infiltrate each cell.

Water quality results for the first year of testing corroborate initial bench-scale laboratory results. Bench tests confirmed the identification of materials suitable for use in reclaiming these minesites.

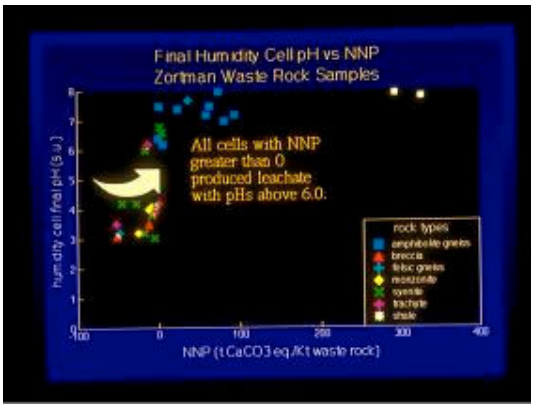

Figure 4. Humidity cell pH vs. acid-base static results for waste rock material, Zortman Mine.

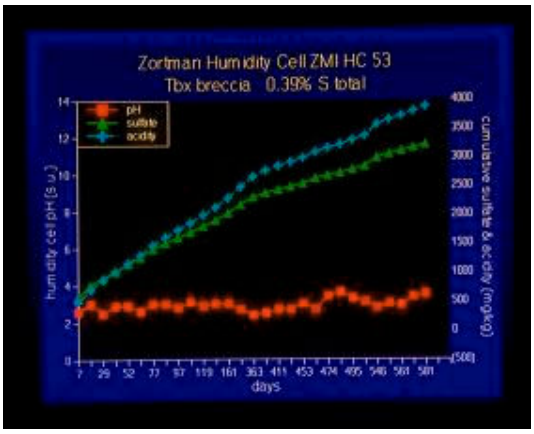

Figure 5. Humidity cell water quality results showing acid generating characteristics.

Prediction, Mitigation and Control of Acid Rock Drainage

For seven years, our personnel have conducted geochemical analyses and accurately predicted water quality and reclamation impacts for various mining projects. Through this experience we have gained significant insight into the technical aspects of permitting major hard rock mines in highly sensitive environments.

Confidential Characterization Studies

In support of the operator's Aquifer Protection Permit application, our personnel, then under the direction of another engineering firm, completed large-scale, geochemical evaluations of the surface and underground mine materials for a large underground copper mine in Arizona.

Materials characterization techniques for both studies included petrographic observations (Figure 6), x-ray diffraction, static testing, partial digestion analyses, and column leachate extractions.

Previous water monitoring had included surface sites around the tailings and waste rock facilities and nested monitoring wells adjacent to the tailings piles. Additional water sampling sites included in this study were located deep within the underground workings. Surface and ground water quality data were compiled and reviewed.

Surface tailings evaluation

The surface evaluation was conducted to predict future water quality and impacts to revegetation associated with decommissioning and reclaiming these large tailings facilities.

Results indicated that tailings had not acidified to depths greater than 2 meters. Water quality in the deeper tailings and underneath the tailing piles was relatively unimpacted when compared to surface tailings pore water quality.

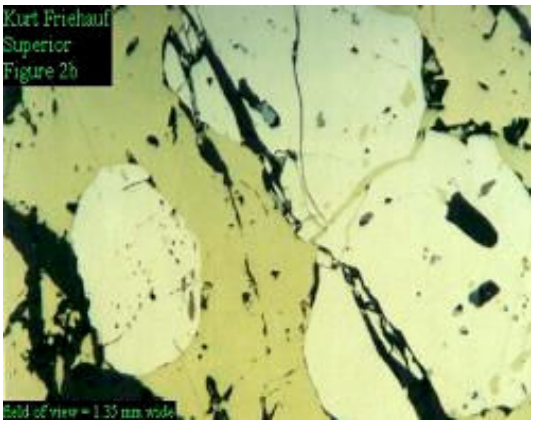

Figure 6. Reflected plane polarized light photomicrograph of advanced chalcopyrite flooding in C-bed ore, Arizona.

Underground mine workings evaluation

The underground evaluation was conducted to characterize the existing mine water quality and to predict impacts as a result of flooding this very large, very deep, underground copper mine. The underground mine water was sampled and analyzed. Materials from stopes and tailings backfill were characterized.

Interpretation of water quality data indicated that the underground mine water was not greatly impacted. This due to the operator's significant ability in engineering the underground workings so that water was diverted from the minesite. Furthermore, qualitative analysis suggested that, when the underground workings were flooded, the overlaying carbonate-dominant lithology would provide sufficient buffering capacity to the hydrologic system to maintain a circum-neutral pH. Recent water quality information from the minesite has corroborated the previous modeling results.

New World Gold Project

The New World Mining District is located near Cooke City, Montana just north of Yellowstone National Park. In support of the mining company's mining permit application and working with the State of Montana, the company administered oversight for the extensive, bench-scale geochemical studies.

These studies implemented an array of techniques to characterize ore, waste rock, simulated tailings, and construction and foundation materials. Select rock samples were screened using static testing and submitted for subsequent petrographic and whole rock analysis, and humidity cell and bottle-roll leachate extractions.

In addition, extensive geologic data provided by the U.S. Geological Survey were compiled and interpreted (Figure 7). Site-specific water quality information from adits, surface monitoring sites, and monitoring wells was gathered to characterize background conditions within the immediate area of proposed mining. These data correlated well with local water quality information compiled by the USGS (Figures 8 and 9).

Conductivity and pH data allowed the identification of natural and anthropogenic sources contributing to existing water quality impacts. Results indicated that impacts to water quality were dominantly associated with historic mining disturbances. Naturally occurring

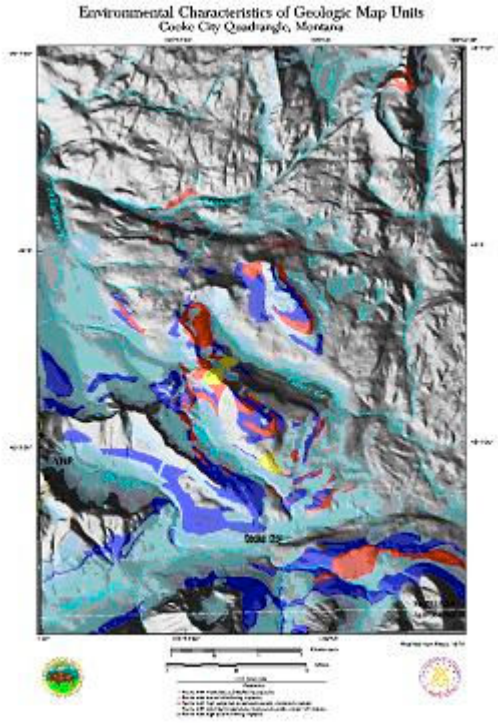

Figure 7. Environmental geology, New World Mining District. Cool colors indicate carbonate lithologies with net acid buffering capacity. Warm colors indicate net acid producing lithologies.

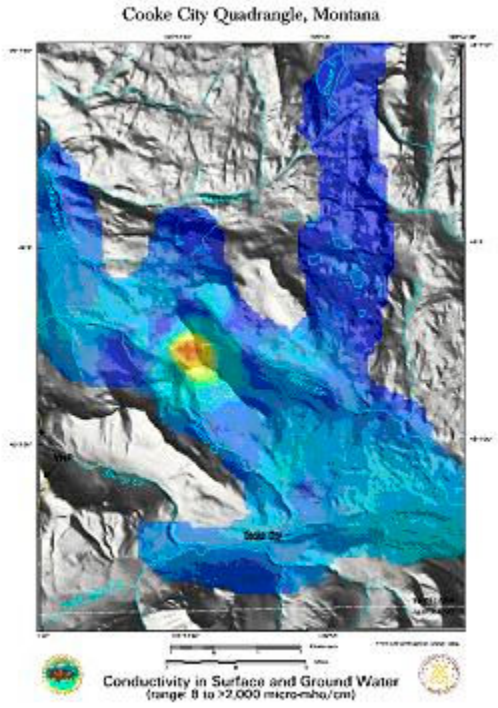

Figure 8. Conductivity in surface and ground water, New World Mining District. Warm colors indicate higher conductivity associated with historic mining disturbances in net acid producing areas.

sulfide mineralization contributed significantly to adverse impacts as well (Figure 8). However, geochemical and water quality data also suggested very strongly that, due to dilution and the dominant carbonate-based mineralization found in the immediate area (Figure 7, light blue), the proposed operations would not significantly impact water quality in the downstream environment (Miller and Gurrieri, 1997).

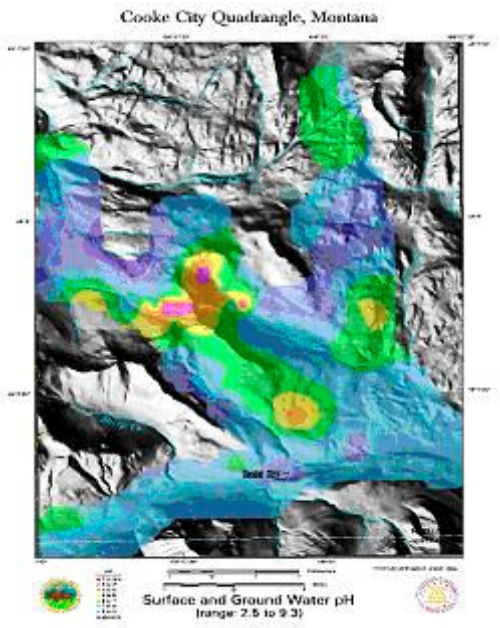

Figure 9. Surface and ground water pH, New World Mining District. Warm colors indicate acidic pH.

Rock Creek Project

Pursuant to the Montana Mined Land Reclamation Act and the National Environmental Policy Act, it was necessary to evaluate potential impacts to water quality as a result of mining ASARCO's Rock Creek deposit.

Our approach used comparative modeling of the geology and hydrology of the Rock Creek deposit and a very similar silver deposit located nearby in Troy, Montana. The Troy Mine has been active during the past fifteen years. This study included an independent literature review of the past nine years of water quality data compiled for the Troy Mine. In addition, preliminary static and kinetic geochemical testing was conducted for both deposits.

Results suggested that the two deposits were geochemically and probably paragenetically comparable, and that potential water quality impacts associated with mining the Rock Creek deposit would be similar to water quality impacts currently associated with the Troy Mine (Miller, 1997). Adverse water quality impacts related to the Troy Mine were shown to be extremely limited, and probably a result of natural variation. Our work was instrumental in expediting the completion of the mine permitting process for the Rock Creek Project.

MacDonald Meadows Gold Project

Canyon Resources had proposed mining a world class gold deposit located very near the Blackfoot River in Montana. Consequently, extreme scrutiny has been exercised by the operator, the regulating agencies, and interested environmental groups.

Peer review of the operator's column leaching protocol was conducted and recommendations for modifications were given. As a result, this study has helped identify mitigation and alternative mining and reclamation plans that would lower the environmental risks associated with mining this world-class gold deposit.

Remedial Studies

We have participated in various compliance processes. Compliance actions noted here were conducted, and the associated plans have been prepared and reviewed, with oversight from USEPA pursuant to CERCLA and the Clean Water Act.

Zortman/Landusky Minesites Compliance Plan

We have assisted as technical advisor for the conceptual design of the Zortman /Landusky Minesites Compliance Plan. This plan was prepared as a result of enforcement action taken by the State of Montana pursuant to the Montana Water Quality Act with USEPA oversight.

To achieve compliance, the plan required the use of acid buffering materials for reclamation and remediation. Our work contributed to locating, characterizing, and segregating these materials. A qualitative predictive approach employed site reconnaissance, detailed geologic mapping and characterization, static testing, and various leachate extraction testing techniques.

As a result of this study the proposed mine waste segregation program incorporated specialized materials handling techniques necessary for limiting impacts to surface and ground water quality.

Butte Mine Flooding Operable Unit

Our personnel, working with the State of Montana, edited and provided recommendations for changes to the draft Record of Decision (ROD) issued for the Butte Mine Flooding Operable Unit in the Butte Addition to the Silver Bow Creek/Butte Area National Priority List Site (Figure 10). The ROD addressed water-related issues associated with flooding the historical underground mine workings and the Berkeley Pit.

Figure 10. Berkeley Pit and pit lake.

We recommended that the alternatives assessed for water treatment had not been fully investigated and that additional, less costly alternatives should be studied.

Butte Active Area Operable Unit

We assisted in the review and revision of water treatment plans brought forward by Montana Resources, current operators of the active minesite at Butte. These plans were submitted in response to a regulatory request to update the operations and reclamation plans for the active mine area.

We recommended a water treatment plan, not addressed in the original Remedial Investigation/ Feasibility Study, that would provide for chemical neutralization of water inside the Berkeley Pit by the addition of lime kiln dust. This would increase the pH of the pit water and precipitate metals in situ as required by statute.

Reclamation Design and Closure

We have participated in the conceptual, preliminary, and final design of various aspects of reclamation design. Projects have included evaluating the potential for revegetation success, potential to limit acid production, and variations of slope aspect to limit infiltration.

Confidential Client - Reclamation Cover

Pursuant to the Mined Land Reclamation Act, in support of the operator's reclamation plan, we have assisted with preliminary design for capping over 14 million tons of sulfide tailings located in Arizona.

The design included an amended soil top layer over a water retention barrier and an inert slag underdrain / capillary break as key components for the successful use of the cover. This design would mitigate impacts to reclamation, reduce infiltration into the tailings piles and limit ground water impacts to the alluvial aquifer.

Zortman/Landusky Mine Complex Reclamation Cover

We provided technical review of final design for capping the waste rock and heap leach piles at both the Zortman and Landusky minesites. Water quality data, materials characterization data, infiltration modeling results, and revegetation data associated with reclamation test plots were reviewed and recommendations for capping surface facilities were submitted.

Golden Sunlight Mine - Slope Reclamation

Personnel assisted in the development of a revised reclamation design for the Golden Sunlight Mine located near Whitehall, Montana. At issue was the angle of slope that would be used for final reclamation of the 300-foot-high waste rock repositories.

The operator had proposed a 2 horizontal (H):1 vertical (V) overall final reclaimed slope. We reviewed infiltration, temperature, oxygen diffusion, vegetation, and particle size data from reclamation test plots. Results indicated that, although the 2H:1V profile would disturb less surface area and be more effective in limiting infiltration, a 3H:1V slope would be safer to access and require less erosion control maintenance over the long term.

Construction Materials Testing

Los Alamos National Laboratory Emergency Measures – Los Alamos, New Mexico

We were responsible for environmental permitting and quality control coordination for the construction of seven flood control projects, including a 300-foot-high water detention dam, in and around the Los Alamos National Laboratory area. Construction material testing results were reviewed and submitted to the Army Corps of Engineers Emergency Response Team. We also acted as Radiation Safety Officer during the construction of these projects around these highly restricted nuclear technology sites.

BILLING RATES

Service	*Rate (US$/hour)*
Site Investigation	55
Report Preparation	75
Peer Review	85
Project Management	95

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