The following file is part of the
James Doyle Sell Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of “fair use.”

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.
The Mowry Project area is located in the southern part of the Patagonia Mountains in southern Arizona. The claims are about 20 miles by road east of Nogalas, Arizona, near the Arizona - Mexico border. 434 unpatented claims are within the claim block which is called the Mowry Mine Group. An additional 73 unpatented claims, the Four Metals Group, are on the southwest corner of the Mowry Mine Group. We hold these under a joint venture agreement with Noranda.

Ease of access within the area is variable as it is mountainous but includes some large flat areas. Although rough roads and jeep trails make it possible to reach the vicinity of most areas, cliffs, steep canyons or gullies may make it difficult to reach specific locations.

The following is a brief summary of the history, geology, and mineral potential of the Mowry Property.

Mineral deposits in the Patagonia Mountains have been known since the 1850's. The first substantial recorded production was from the Mowry Mine in the 1860's. The mine is within the north eastern section of the claim area and was originally worked for silver and only later for lead and zinc. Most mines and prospects in the district have followed this same pattern - early silver production followed by base metal mining.
The main production period for the district was from about 1900 to 1930. The Washington Camp - Duquesne, Mowry, Harshaw and 3R areas were all active. High grade sulfide areas were known but it was the silver content of the oxidized surface areas which made mining profitable. According to Goodbe, mining then continued intermittently from about 1930 to 1960. Primary sulfide ores were mined during this latter period. These efforts were, unfortunately, not as successful as the earlier. No serious mining was done in the area after the close of the Washington Camp and Harshaw mines.

Exploration has, in contrast to mining been very active over the past twenty years. Numerous exploration projects have been undertaken by mining and exploration companies ranging in size from one man efforts to sizeable projects. A number of deposits have been located of which two are worth special note. Asarco has drilled a low-grade silver ore body mineable by open pit near Harshaw north of the Mowry Mine while a deeply buried porphyry copper ore body has also been found by Kerr McGee under Red Mountain to the north-west of Mowry. Both properties have been considered economically marginal although the increase in the silver price over the last year will have made Asarco's silver property more attractive. These new ore bodies support investigating a wider range of exploration targets as neither type of occurrence had been found in the Patagonia Mountains before.

Previous work on the Mowry property has usually been confined to reports dealing with known mines or prospects. Most reports have been limited to specific aspects of the larger mines with only a few covering the much larger area away from them. A list of the reports and papers of a general nature are
Minor detailed mapping has been done within the Mowry claims. R. Barnes mapped the Sycamore Canyon area for Getty Oil in 1971 including the Four Metals mine while Guajolote Flat was previously mapped by Warren in 1970, also for Getty Oil. Both areas are within the sedimentary and volcanic formations have also been mapped.

The Patagonia Mountain block is a complexly faulted anticline. The anticlinal axis trends north-northwest paralleling the mountain range and plunges north at 30° to 60°. The plunge becomes steeper to the north as the exposed formations become progressively younger. The anticlinal structure divides the Mowry claims into three sections.

The western side of the anticline is bordered by a Tertiary granodiorite pluton. Rock types within the pluton vary from granite to diorite although large areas appear to be uniform granodiorite. The pluton has intruded Jurassic and Cretaceous country rock and may also underly the entire Mowry claim block to the east.

Cretaceous volcanic and sedimentary formations occupy the crest of the anticline and cover the largest area forming a band through the center of the claim block. Two series of Cretaceous units are recognized. The older group is predominantly acidic volcanic tuffs, flows, agglomerate and related rock types. The younger group is predominantly shale, argillite, conglomerate and sandstone in the lower half and shale with calcareous beds, including some limestones, in the upper half. There are small, shallow intrusives scattered through the district which suggest the vertical thickness of the
volcanic and sedimentary formations are thinner than the 20,000+ feet of stratigraphic thickness measured by Baker. The eastern boundary of the Central, Cretaceous section appears to be a major fault zone.

The eastern section of the anticlinal structure is highly variable. Cretaceous volcanics are to the north while Paleozoic limestone and dolomite are predominant in the center of the block. The southern part is composed mainly of Pre-Cambrian granodiorite and amphibolite and Paleozoic carbonates and marble. The contact between the eastern and central sections, as previously mentioned is a fault.

Field relations are complex. Faulting is pervasive throughout the area with the primary fault sets very evident. One set strikes north-northwest parallel to the anticlinal (mountain) axis. Some of these faults appear to have large displacement — such as the faults between the Cretaceous volcanics and the Paleozoic carbonates to the east which could offset the beds a total of 10 - 15,000 feet. The second set strikes northeast with displacement less well known although they appear to have less offset than the first group. Age relations between the two sets are poorly known but they probably formed at the same time.

Folding is erratic, strata in some areas tilted with little or no folding while other areas have prominent, steeply folded beds which may even be overturned.

Breccia is widespread throughout the Patagonia Mountains with two types being evident. Breccial pipes, the first type, are recognized only within the Tertiary granodiorite. Some of the large pipes such as the Four Metals,
Ventura and Red Mountain have been mineralized with copper and molybdenum sulfides following or at the end of pipe development. Breccia bodies, the second type, are present within the sedimentary and volcanic formations. All the second type investigated to date are silicified fault breccian not true pipes. They all appear to be located along faults or fault intersections. Several cycles of brecciation-silicification can usually be seen within the breccia bodies. All breccias are stained to some degree with iron and manganese oxides.

Geologic efforts within the Mowry claim area have been hampered by a lack of rock exposure. Most contacts are hidden under soil, vegetation, or both. Additionally, rock types are uniform over large areas with few marker beds. These conditions have made it difficult to get the detailed look at the geology which is needed for a complete understanding.

The economic geology of the Mowry Property parallels the basic geology. The western section, within the intrusive, contains copper and molybdenum mineralization of the copper type. This contrasts with the silver-lead-zinc vein and replacement deposits found within the volcanic and sedimentary formations on the crest and eastern side of the anticline.

All of the mines and prospects known within or adjacent to the Mowry claim group are strongly structurally controlled. The ore bodies are located along faults or fault intersections, as fissure fillings, or as replacement of vein wall rocks. There is also some suggestion of fold axis control in the case of Blue Nose, Endless Chain, Morning Glory, etc. in the north end of the Cretaceous block.
A less obvious feature is the chemical control exorcised by carbonate wall rocks within the volcanic/sedimentary formations. Carbonate rocks are the host for mineralization within the Washington Camp - Duquesne area where skarn deposits are obvious and well documented. They also appear to play a major role in the Mowry Mine and Morning Glory - Endless Chain areas to the north as well as the less well known prospects.

The granodiorite intrusive exposed on the west of the anticline is mineralogically as well as lithologically distinct from the volcanic and sedimentary formations which cover the rest of the area. Mineralization is structurally controlled, with traces of chalcopyrite and molybdenite occurring sporadically throughout the intrusive, within joints, veins, and shear zones. Sub-economic concentrations occur within sheeted joints striking NE and dipping northerly 30° to 50°. The density of jointing found has not been high enough for the rock mass to reach economic grade. Copper and molybdenum also occur within some of the larger breccia pipes such as Four Metal, Ventura and Red Mountain. The breccia pipes appear to have acted as ground preparation for the later (?) introduction of copper and molybdenum in much the same way as the veins, joints and shears. No copper-molybdenum deposits are known to occur outside of the intrusive.

The central section along the crest of the anticline is underlain by Cretaceous formations which are predominantly volcanics and argillites. Mineralization is concentrated within the upper formation, the Molly Gibson. The Molly Gibson is mainly argillite but contains thin limestone beds in the upper half of the unit. The ore bodies are small deposits which seem to be located along faults of fold axis which cross limestone or calcareous shale beds. Zinc usually is greater than lead while silver was the main
metal of value. The same as at Mowry, Washington Camp, etc.

The Paleozoic carbonate portions of the east side of the anticline have been the main producing centers for the Mowry Project area. The Mowry Mine and the Washington Camp - Duquesne district have been the source for virtually all of the ore from the southern Patagonia Mountains and about half of that from the entire mountain range. Both centers are structurally and chemically controlled. The Mowry Mine is located along a fault separating Devonian limestone from Pre-Cambrian granodiorite. Ore occurs as open space fillings and replacement of carbonate fragments within the fault. A sizeable proportion of the ore has come from replacements within limestone and dolomite along the north side of the Mowry Fault. The Washington Camp - Duquesne mines are replacement bodies along contact between Tertiary granite and Paleozoic marble. These skarn deposits have been some of the best produced in the district.

Mineral zonation within the Patagonia ore bodies is readily apparent. Rich surface Manganese-silver ore gave way to silver-lead then lead-zinc-silver followed by zinc and rarely zinc-copper ore at shallow depth. This transition took place in less than a thousand feet in the Mowry Mine and even less in some of the others. This telescoped mineral zonation is especially noticeable in the mines and prospects within the Molly Gibson Formation; the Morning Glory, Endless Chain, Blue Nose, etc. The normal interpretation for this condition is to assume shallow intrusives, at least along mineralized zones. Geomorphic data indicate that the Forsyth Zone, a north-east striking mineralized shear zone, horse tails into the Cretaceous sediment to act as a feeder system for the mines and prospects within the Molly Gibson Formation.
The Forsyth Zone contains a number of small mines and prospects for several miles along its length and so could easily act as a channelway for mineralized solutions rising from a shallow intrusive. The presence of mineralization and alteration along other major faults is also suggestive of intrusives underlying the sediments at shallow depth. Additional indirect support for this idea is provided by the aero magnetic survey which suggests that the volcanic and sedimentary rocks may be truncated at shallow depth by intrusive rocks.

Alteration is pervasive throughout the claim area and entire mountain range. It appears to become more intensive towards Red Mountain breccia pipe at the north end of the Patagonia Mountain range. Three types of alteration account for almost all alteration sun. Pyritization, argillization, and silicification have been developed along faults, shears fractured areas, and joint sets. The structural control is best seen to the south of the range and becomes less obvious to the north where alteration envelopes are wider and tend to merge forming broad altered areas.

Silicification is most obviously tied to faults having major displacement. It is present as silicified breccia within volcanic and sedimentary rocks. Faults were invaded by quartz bearing solutions which silicified and cemented the fault breccia. A number of repetitions to the development of silicified breccias as we see them now.

Breccias are very common within the Paleozoic strata and the lower portion of the overlying Cretaceous volcanics. But became rare within the upper portion of the Cretaceous volcanics and overlying sediments.
It is unclear, with the present knowledge, if the concentration of breccia within the Paleozoic and lower Cretaceous formations is due to their nearness to underlying intrusives, the more brittle nature of these rocks or some other factor such as an unexposed intrusive. The answer to this question could have some economic significance.

Pyritization and argillization are much more widespread than silicification. Pyrite is present, sometimes in large quantities, along joints, fractures etc. It appears to be more characteristic of the intrusive while argillic alteration is more pronounced in the volcanics. Both types normally however occur together. Pyrite is usually most common along the vein or joint itself while clay is developed in the adjacent country rock.

The relationship between the silica and pyrite/argillite alterations is uncertain. Minor pyrite and clay alteration does occur with the silica breccia but no quartz metasomatism similar to the breccias has been found with the pyrite/clay alteration. It appears probable at this point that instead of a simple quartz-pyrite-clay alteration zonation there may be two separate sources for the alteration types.

Local geochemical surveys have been made over a number of prospects including Faro, Findlay and Adams Canyon, Nellie Guajolote Flat, Tom and Morning Glory. The results to date have not been as good as was hoped as only sub-economic mineralization has been found. The only regional geochemical reconnaissance available was done by L. A. Hansen and Associates in 1979. (Hansen 1980) Rock, soil, and stream sediment samples were taken on an irregular grid throughout the southern Patagonia mountains. Obvious anomalous
areas in the four general locations already known to contain mineralization. Those are the Four Metals, Morning Glory-Endless Chain, Mowry and Shaffer Ranch (northern extension of Washington Camp structure). The granodiorite pluton has anomalously high values of copper and molybdenum which correlates with the type of mineral deposits found there. Silver, lead, zinc anomalies characterize the volcanic-sedimentary sequence which is again what we would expect. The geochemical data suggests there may be a separate source for the two mineralization types.

Geophysical data includes an aeromagnetic survey of the entire area flown in 1970. As well as a number of local I. P. and ground magnetic surveys completed at various times. Some low copper, high pyrite zones have been found within the intrusive but in general only the ubiquitous alteration zones have been found.

A number of conclusions have been reached from the foregoing information as well as some additional data which may not have been mentioned earlier.

1. The granodiorite intrusive has a high potential for porphyry type mineralization and a number of areas are already known which contain 0.2% to 0.4% copper. The most likely target is the area immediately north of Four Metals or at depth below it.

2. The intersection of deep structures or intrusives and carbonate rocks within the volcanic-sedimentary sequence have been the only large producers in the past. They will probably be the large future producers. The correspondence between production and the amount of limestone, dolomite, or marble along a deep
fault or intrusive contact cannot be ignored.

3. Alteration, geophysics, and geochemistry will need to be used as an aid to basic structural and lithologic mapping. Alteration has been so prevasive that it does not appear to bear any direct relation to ore. In past the methods just named have been misleading.

4. The most likely targets for buried Ag./Pd./An. mineralization appears to be as follows:

A. Northern extension of the Washington Camp mineralization in the Shaffer Ranch area.

B. The contact between the Paleozoic carbonate formations and Cretaceous Volcanics and sediments north of Mowry Mine.

C. Down dip extensions of limestones within the Molly Gibson Formation around the Morning Glory and Endless Chain mines.

5. Alteration mapping should be a part of geologic mapping. No consistent attempt has been made in this direction and it could yield good results despite the lack of success to date.

Recommendations for Future Work

1. Detailed geologic mapping for structural and stratigraphic information to be complete as soon as possible. There is too little known about the basic geology to be confident of picking the best targets.
2. Expand Hansen's geochemical survey in areas of low sample density. The present samples are biased in favor of the known exposed occurrences. There may be some near surface sub-cropping deposits or mineralized areas which could be located this way.

3. A series of three or four holes to be drilled north of Four Metals with each new hole sited on the basis of the preceding one.

4. Local geophysics and geochemistry following mapping before siting the most promising targets within the sediments.

The overall potential for this property appears to be fair in both the intrusive and carbonate portions. Future results in the carbonate section will be dependent on having the basic geologic data. The Four Metals area will not be nearly as sensitive to this as much of the data will have to come from the drill core anyway.
APPENDIX
REFERENCE LIST


Godbe; 1968, Private Company Report on Ore Deposits within the Patagonia Mountains


Marks, C. A., and Bickford; 1968, Private Company Notes on Mines and Prospects within Claim Area

Moores, Richard C. II; 1972, The Geology and Ore Deposits of a Portion of the Harshaw District, Santa Cruz County, Arizona; Thesis, University of Arizona


March 30, 1982

To: Mr. E. Peter Matthies, Vice President and General Manager

From: William T. Worthington, Chief Geologist

Exploration Proposal

Mowry Project
March 30, 1982

Mowry Project
Proposed Exploration Program, 1982

Abstract

The Mowry Project is located five miles south of Patagonia in southeastern Arizona and consists of 434 owned unpatented claims and 73 leased unpatented claims totaling 8040 acres.

Production from company property is negligible but past production from the surrounding district exceeds 17 million dollars in ores valued for zinc, lead, copper and silver.

On the leased Four Metals property a breccia pipe disseminated copper ore body has been fairly well delimited by Noranda Exploration, Inc., and has been estimated to contain 3.1 million tons averaging 0.82% copper.

During the past fourteen years the property has been extensively explored for possible porphyry copper, skarn, replacement breccia and vein type ore deposits at a cost of $943,104.87. Geologic mapping, along with geochemical, aerial photographic, magnetic, and induced polarization surveys have been conducted. More than 40,000 feet of diamond and rotary drilling have been completed without a single block of ore being developed.

While the possibility of an exploitable ore deposit being present cannot be ruled out, the likeliness of finding such a deposit now appears to be extremely remote. The $55,000 annual holding cost could be better spent on other properties with a higher probability of success. The project is, therefore, recommended to be dropped.

If the property is not dropped, diamond drilling will be conducted in fulfillment of 1982 assessment obligations.

Pertinent maps relative to the project are included herewith.
March 30, 1982

Mowry Project
Proposed to be Dropped, 1982

Location

The Mowry property is located approximately 5 miles north of the border with Mexico in the Patagonia Mountains of Santa Cruz County in southeastern Arizona. It is approximately 5 miles south of the Town of Patagonia, 64 airline miles south-southeast of Tucson and within the limits of the Patagonia Mining District. The property is accessible by well graded gravel roads and all service facilities and supplies are available within a reasonable distance. The topography is generally characterized as being rough, with the peaks of the Patagonia Mountains at over 7,000 feet, 3,600 feet above the surrounding valley floor.

Property Status

The company first entered the area with the location of a large block of claims around the Mowry Mine in 1967. The area of interest was gradually expanded and subsequent staking enlarged the property to include 434 claims totaling approximately 6,580 acres by 1971. Holdings were again enlarged in 1978 with the signing of a lease on the adjoining Four Metals property of Noranda Exploration, Inc. The leased property consists of 73 unpatented claims totaling approximately 1,460 acres. Total controlled land, therefore, consists of 507 unpatented claims totaling approximately 8,040 acres. Annual direct holding cost is approximately $55,000.

The lease agreement with Noranda requires an annual expenditure on the Four Metals property of $15,000. Of this amount, $7,500 can be credited as assessment expenditure toward our own claims. Once Sharon has expended $535,000 on the property, it will own an undivided 51% interest.

Historical Background

The first recorded exploration in the region was by Jesuit Priests who conducted small mining operations using Indian labor in conjunction with their missionary work during the late 17th century. Sporadic new discoveries were made through the early 1800's when, with the abandonment of military protection, the region was returned to Apache Indian control. The Gadsden Purchase in 1853 brought the area under the jurisdiction of
the U. S. Government and, thus, began a period of extensive activity that lasted into the early 1900's. The Mowry Mine was a major producer of silver and lead from 1859 to 1863, was a minor producer during the 1870's and was again a major producer from 1904 through 1915. Mines in the Washington-Duquesne area were first brought into production in the mid 1870's but soon interest subsided. The area was reactivated in the late 1890's and continued to be quite productive into the 1920's. Considerable development was conducted during the early 1900's on the Four Metals Mine but little production was recorded. The Hardshell Mine attracted some attention in 1879 but did not become a significant producer until 1895 when high grade silver ore was discovered. Other smaller mines were also developed at various times during this period. In more recent years, a number of companies have been active in the region and several interesting, though not economic, mineral occurrences have been defined.

Past Production

Value of production from the Patagonia Mining District is estimated at 17.9 million dollars from 691,000 tons of ore produced. Metal production is estimated at 27 thousand tons of zinc, 22 thousand tons of lead, 18 thousand tons of copper, 3.3 million ounces of silver and 7.3 thousand ounces of gold. Production from the Harshaw Mining District, adjoining the Mowry Project to the north, is estimated at 41.5 million dollars derived mostly from zinc, lead and silver ores. Of all of the production, only a tiny fraction has come from property controlled by Sharon.

Present Reserves

There are no known reserves on the property located by Sharon. The leased Four Metals property has been estimated by Noranda to contain a mineral reserve of 3.1 million tons averaging 0.82% copper or, using a lower cutoff, 14.7 million tons of 0.50% copper along with minor molybdenum values.

Geology

The Patagonia Mountains trend north-northwest and are composed of igneous and sedimentary rocks that range in age from Cambrian through Tertiary. The southwestern part of the range and the Sharon property consist of a northwest trending elongated Tertiary multiple intrusive known as the Patagonia Granodiorite. The intrusives bear many of the characteristics of a porphyry copper and low grade disseminated and fracture controlled copper mineralization has been observed in a number of areas. The most notable feature within the granodiorite is the Four Metals Breccia Pipe where a reserve of low grade copper has been developed.

Adjacent to the granodiorite and also trending to the northwest is a mile and a half wide block composed of a variety of Cretaceous volcanic and sedimentary rocks that plunge in a northwesterly direction. A number of large breccias are present in this block, especially in the southern portion. They are irregular, fault controlled, and some have been mineralized, but are not known to contain ore. Principal production from this block has come from shattered and mineralized quartzite and limestone beds at the
Endless Chain and Morning Glory Mines near the northwestern corner of Sharon's property.

At the southeast corner and just off Sharon property is the Washington Camp-Duquesne area. Permian and Pennsylvanian limestones with minor quartzite have been folded and virtually surrounded by igneous rock. Skarn type replacement bodies containing copper and zinc ores formed along the contacts between the limestone and igneous rocks.

The northeast corner of Sharon's property is a zone of northwest striking jumbled fault blocks containing folded and tilted sediments, intrusives and volcanics. Here the Mowry Mine exploited lead and silver ores that formed along the fissure-vein contact between marbelized, dolomitic limestone and porphyritic quartz monzonite. Most of the faulting within the area tends to be steep gravity faulting, dropping blocks successively to the north and west, along respectively northeasterly and northwesterly faults.

Exploration to Date

Initial efforts were concentrated around the Mowry Mine and northwest of the Washington Camp-Duquesne area. Geologic mapping along with geochemical surveys, aerial photographic surveys and magnetic surveys were conducted. Approximately 60 line miles of induced polarization geophysical surveys were completed. Diamond drilling and rotary drilling were used to test favorable areas. Although some mineralization was encountered, no commercial ore was discovered.

Beginning in 1975, efforts were concentrated in the western half of the property, in the Faro area and near the Four Metals property, to test for porphyry type copper and molybdenum ore. Additional geologic mapping, geochemical, induced polarization surveys and drilling were conducted. Scattered weak mineralization was encountered but nothing was of ore grade.

Since 1978, efforts have been concentrated on the Four Metals lease. Several Noranda diamond drill holes have been deepened and new holes drilled. The effort was directed at a possible deep, large, low grade porphyry copper type ore body below the Four Metals Breccia Pipe area. Copper grade was found to increase slightly with depth, but no ore grade material of significant width was encountered to a depth of 3,000 feet. The reserve of copper ore previously developed by Noranda in the breccia has not been further explored since its limits have been fairly well defined.

To date, rotary drilling totaling over 12,000 feet and diamond drilling in 26 holes totaling over 30,000 feet have been completed without a single block of ore being developed. Expenditures on the property to date amount to $943,104.87.

Potential Reserves

Within the Four Metals and Faro areas there is a potential for a large 100 million ton plus copper molybdenum deposit similar to that found
by Kerr-McGee Corp. at Red Mountain seven miles to the north. If such ore exists, it is probably located well below 3,000 feet in depth. Near surface copper potential is limited to the fairly well defined Four Metals Breccia.

Vein, skarn and replacement type ores could be concealed beneath unfavorable formations in the eastern and northern portions of the claim block. Such deposits should be similar to those mined previously at Mowry and in the Washington Camp-Duquesne areas and would probably average 100,000 to 200,000 tons of lead zinc ore with low grade silver.

Proposed Exploration

It is proposed that the property be dropped because of its limited economic potential.

If the project is not dropped, a diamond drilling program, consisting of the drilling of two holes, is planned to further evaluate the property.

Economics

The copper reserve at the Four Metals Breccia has been recognized for more than 75 years and it is yet to become economic. It is not anticipated to become minable within the foreseeable future.

If a deep porphyry copper deposit is present, it is probably similar to the one located at Red Mountain. The Red Mountain deposit is indicated to be approximately 450 feet thick, average approximately 0.71% copper, and is between 3,400 and 5,200 feet beneath the surface. The economic prospects of such a deep and low grade deposit, even though large, are quite dismal.

The breccia deposits, with the exception of Four Metals Breccia, show no signs of containing commercial ore.

Skarn and replacement deposits of zinc, lead, silver and copper appear to offer the best potential for commercial grade ores at this time. Efforts to find such deposits have, however, thus far been without success. The limited size of the known occurrences does not lend encouragement that large deposits of this class will be found.

In summary, it can be stated that, based upon exploration results to date, the chances of finding an exploitable ore deposit on the Mowry property are extremely remote. The $55,000 annual holding cost could be better spent on other properties with a higher probability of success.

Other

An expenditure of $15,000 will be necessary on the Four Metals lease if we fail to notify Noranda Exploration, Inc. of our intention to drop before May 31.
Maps

Plat 1 - Mowry Project; geographic location
Plat 2 - Mowry Project; geographic location
Plat 3 - Mowry Project; geology, topography, property ownership.

William T. Worthington
Manager Exploration

APPROVED:

Gaylon W. Hansen
Manager Exploration