NEVADA BUREAU OF MINES AND GEOLOGY
MACKAY SCHOOL OF MINES
UNIVERSITY OF NEVADA • RENO
RENO, NEVADA 89557

(702) 784-6691

10 March 1980

NBMG OPEN-FILE REPORT 80-3

Possible Inventory/Evaluation Procedure,
MX Target Area, Nevada
with
Preliminary Cost Estimate

This information should be considered preliminary. It has not been checked for completeness or accuracy.

photo copy:

Possible Inventory/Evaluation Procedure
MX Target Area, Nevada

by Joseph V. Tingley

Suggested Evaluation Area Limits

1. Project Area: the large area defined by the outer perimeter of the entire MX project.

2. Range-Valley-Range unit: this would include each subject valley and its flanking mountain ranges.

3. Valley Segment: would include a portion of the valley floor, its adjacent pediment and nearby lower mountain slopes.

4. Cluster Area: the area of any single cluster or "racetrack". This is the smallest land unit deemed practical to study.

The largest area would be studied in the most general phase of evaluation with the more intense, highest cost studies being reserved for succeeding, smaller study units.

The object of the study would be to define those areas most favorable for generating future exploration activity. Once such an area, on any scale, is defined, it should then be eliminated from consideration as an MX site, and the remaining, less favorable, areas should be carried to the next, more detailed, study phase.

It is felt that this reverse procedure, that of eliminating the most favorable areas early in the process and continually focusing more detailed attention to the remaining less favorable areas, would have the best chance of insuring that the final site picked for any specific "racetrack" or "cluster" would be that site least likely to be valuable for mineral exploration.

At the present time, it may be too late to have much effect on the largest unit selections; the project appears to have a definite minimum size requirement, and it may not be possible to recommend that entire valleys within the project area be dropped from consideration. If this is true, the only question on siting that remains is that of adjusting locations within a selected valley. This would mean that there would be no reduction in the size of the study area from the first study phase to perhaps the third phase, and that the funds necessary to complete these studies would be proportionally higher.

Evaluation Phases

1. Phase One, most general study, largest area.

   a) Literature Search, compilation of information. This would include collection of published data on each mining property, mineral occurrence, oil/gas areas, and geothermal sites within the entire MX project area. Data would be placed on CRIB forms, and NBMG card forms to allow for later retrieval and use. Patented and unpatented mining claims information would be compiled to point out areas of current activity. Available aerial photography

(including ERTS and Landsat photos) would be studied to assist in defining regional structural patterns and areas of anomalous coloration and alteration. All this information would be compiled on best-scale topographic maps of the area.

b) Airborn geophysical surveys: both aeromagnetic and radiometric coverage would be invaluable in the earliest evaluation stages. Both types of survey are useful in defining regional structure and rock type as well as defining specific anomalies.

c) Field Investigation. This would be limited during this phase, but would include collection of information in areas outlined by steps a & b, verification of areas of interest, and very limited sampling.

2. Phase Two.

a) Detailed field examination, with some general geologic mapping (general alteration patterns, rock type, etc.).

b) Stream sediment geochem sampling for the entire area on fairly broad spacing, but with a wide coverage of elements.

c) Limited rock chip geochemical sampling; done in conjunction with step (a).

d) Ground geophysical surveys.

1) Ground magnetics, to further define features seen in the aeromag coverage and to provide structural information in alluvial-covered areas.

2) Gravity and/or seismic surveys, to provide depth-to-bedrock information, indications as to rock type, structure.

3. Phase Three

a) Detailed geologic investigation, consisting of detailed mapping, alteration studies, etc.

b) Fill-in stream sediment sampling.

c) Detailed rock chip geochem sampling, water sampling, etc. to gather information on pediment areas.

d) Ground Geophysics, closely-spaced surveys, designed to pinpoint mineral occurrences, would include S.P., I.P., E. M. surveys.

4. Phase Four.

This stage would consist of drilling of the subject area.

It is assumed that the entire area would be investigated in Phase One, and that Phases Two and Three would be conducted on greatly reduced areas. Phase Four, drilling, would be limited to the smallest areas considered, and could possibly be limited to 1 or 2 deep tests per "cluster" with perhaps 1 shallow hole being drilled at each site within a cluster as a final precaution. In this case "deep" would mean +5000 feet to combine testing for oil and deep mineral potential. "Shallow" would mean 1000 to 2000 feet to test strictly for minerals, brines, etc.

Estimated Costs:

Phase One:

1. Literature compilation, field check and verification, based on similar work being done under contract from BLM, NBMG costs would be approximately $0.02 per acre.

   Estimating 22,500 sq. miles or 14,400,000 acres as the minimum size of the study area, a base cost of $288,000.

2. Airborn geophysical work: to gain the maximum benefit from this data, a combined aeromag-gamma ray spec. survey should be carried out over the entire area. This should be done with 1000-foot ground clearance drape flying, at maximum of 1/2 mile line spacing.

   An estimated cost of this stage would be $25 per line mile for aeromag, $35 per line mile for the gamma ray survey. There would be some reduction in cost for a combined survey, but there would also be additional charges for interpretation.

   Using the same area size (22,500 sq. miles),

   a) One mile line spacing
      22,500 line miles x $60/line mile = $1,350,000

   b) One half mile line spacing
      45,000 line miles x $60/line mile = $2,700,000

3. Field Investigation: some field costs are included in the $0.02/acre figure in (1), but it is felt additional field work and some sampling would be generated by the airborn geophysical program. This could increase the cost by as much as $100,000.

Cost Estimate Summary, Phase One

1.	Literature Study	- $288,000
2.	Airborn Geophysical Work	- 1,350,000 to $2,700,000
3.	Supplementry Field Work	- 100,000
		$1,738,000 to $3,088,000

Phase Two: Range-Valley-Range Unit.

As an example, Monitor Valley including portions of the Toquima and Monitor Range area roughly 25 miles wide by 50 miles long, or 1250 sq. miles.

a) Detailed field examination, estimated 6 man-months, $30,000 per area.

b) Stream sediment and rock chip geochem estimated 2000 samples, 11 elements per sample ($25 per sample) = $50,000.

c) Ground Geophysics

1) Ground magnetics, $300 per line mile, done in selected areas, estimated 100 line miles, $30,000.

2) Gravity, 25 mile station spacing, $40 per station, 10,000 stations,

3) Seismic, estimated $2 per foot of survey, done in selected areas, estimated 20 line miles, roughly $50,000.

d) Special aerial photogarphy, such as low-sun angle color, color infra-red, cost estimated at $25,000.

Cost Estimate Summary, Phase Two

1.	Geological field work -	$ 30,000
2.	Geochemical sampling -	50,000
3.	Ground geophysics -	480,000
4.	Remote sensing costs -	25,000
		$585,000 per area

Phase Three: Valley Segment, using an area such as Monitor Valley near the mouth of Northumberland Canyon, an area of 5 miles by 10 miles is under consideration.

1. Field work, 50 sq. miles, estimated 2 man-months, $10,000 per area.

2. Geochem sampling, fill-in stream sediment and rock chip, estimated 500 samples, $12,500.

3. Ground geophysics, work would be done in selected areas, estimated 20 line miles of induced polarization, $30,000, additional $50,000 for other methods such as E-M, seismic, and closely-spaced ground magnetics.

Cost Estimate Summary, Phase Three

1.	Field work -	$ 10,000
2.	Geochemical sampling -	12,500
3.	Ground geophysics -	80,000
		$102,500

Phase Four: Drilling

Cost estimates here would be meaningless, diamond drilling costs for mineral exploration range from $25-$45/foot depending on rock conditions, a 2000 foot hole would cost $50,000 to $90,000. A geothermal well could cost $1,000,000, and an oil test would cost several million. This could be the highest cost phase of the study process.