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UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

PROJECT RECOMMENDATION BY THE ADMINISTRATOR

Mineral Exploration for Base Metals and Gold in Peru (PER/NR/82/001)

I. Background

1. Peru is among the more important mining countries in the world. It is a major producer of copper, zinc, lead and silver. Lesser but substantial quantities of cadmium, indium, selenium, tellurium and bismuth are extracted and sold as by-products. The national economy is heavily dependent upon income derived from the export of metallic mineral products. With a gross national product of US\$ 730 per capita in 1980, Peru ranked among the lower middle-income countries. In 1979, roughly 90 per cent of merchandise exports represented primary commodities, of which 52 per cent were minerals and fuels. Mineral exports in 1980 amounted to \$3,900 million - over half of total foreign earnings.

2. During the 1970s the growth rates in industrial development were reduced sharply to 3.7 per cent, against 5 per cent in the previous decade. To counter the trend the Government in the past several years has taken steps to stimulate vigorously the further growth of mineral production on which the country is so heavily dependant. Given the persistent scarcity of development capital, broad international co-operation is being encouraged. Exploration teams from various countries work closely with Government's central geological survey research and exploration institution, Instituto Geologico Minero-Metalurgico (INGEMMET), under bilateral aid programmes.

3. The mining industry in Peru is regulated by the Ministry of Energy and Mines. With a few notable exceptions, large-scale mining in the country is operated by state-owned companies (Limited Liability Corporations), of which the Empresa Minera del Centro del Peru (CENTROMIN) and the Empresa Minera del Perú (MINERO PERU) are the two most prominent.

4. The current severe depression of metal prices combined with the lack of risk capital is a serious impediment to the development efforts of the Peruvian mining industry. Mineable reserves situation, with perhaps the exception of copper, is also becoming a matter of concern, especially in view of diversification and the planned increase of future production capacities. The need for further development of the mineral resources base is now especially critical.

5. At the request of the Government, in 1981 the United Nations Revolving Fund for Natural Resources Exploration (UNRFRNRE) examined a number of proposals to assist in exploration of a variety of commodities, including coal, base metals, uranium and gold as well as geothermal energy. Priorities were discussed and established with the Ministry of Energy and Mines in November 1981. Subsequently, two areas were selected for exploration assistance by the Fund.

II. The project

6. The objective of the project will be the evaluation of possible economic potential of placer gold in Area I and sulphide zinc mineralization in Area II.

Area I: San Antonio de Poto (gold)

7. Gold is known to occur in the glacial till north of Lake Titicaca in the district of Puno in southeastern Peru. The area is covered by concessions held by MINERO PERU covering 34,530 hectares (ha), which have been made available for Fund activities.

8. It is proposed to carry out exploration over 3 areas, namely:

	ha
Pampa Blanca	8 384
Arequipa Pampa	11 158
Ancocala	8 988
Total	<u>28 530</u>

9. Discounting the surface covered by rock outcrops, lakes and unproductive formations as well as the excluded areas, the effective surface to explore measures about 23,000 ha.

Minimum Work

10. The objective of the project with respect to Area I will be the selection of a potential gold reserve area (probably not covering more than 50 per cent of the initial, effective exploration area).

11. Technical approach. The first stage of the Minimum Work will consist of drilling deep holes aimed at contouring the bedrock and providing the basic information about the lithology and gold potential of various layers of the glacial till and fluviolacustrine sequence. These holes, estimated on average 100 metres (m) deep, will be drilled along lines spaced 5,000 m apart with borehole separation of approximately 1,700 m.

12. A reconnaissance seismic survey will be carried out along the deep drill hole lines to test the signatures of the bedrock and the character of the overlying detrital sequence.

13. The second stage of the Minimum Work will be systematic drilling in a grid pattern designed around 1,200 x 1,200 m centres. Subject to the results of deep drilling, these holes are planned to a depth of 30 m, assumed to be the maximum extraction depth of a conventional floating dredge.

14. It is intended to use a vehicle-mounted, compressed air, rotary/hammer drill rig capable of continuous air-lift sampling.

15. Drilling results will be systematically checked by hand pitting. Samples will be processed complete as extracted. Testing will be done at the field base for total recoverable gold by wet screening and gravity table concentration and tailings will be continuously examined/assayed for gold losses.

16. The estimated net costs of executing the Minimum Work Programme at San Antonio de Poto is \$1.4 million. (Separate accounting of costs for individual areas will not be made.) The duration of field work will be approximately 13 months.

Subsequent work

17. If the results of the Minimum Work are positive, exploration will continue with the objective of identifying drill-indicated reserves of auriferous gravel in the order of 100-150 million cubic metres (m³). The work will consist of systematic drilling in closely spaced patterns on a basic module of 200 x 200 m. The drilling and testing technology will be similar to the one applied in the previous exploration phase.

Area II: Las Orquídeas/San Ramón (zinc)

18. Showings of massive sphalerite have been demonstrated by CENTROMIN, which holds valid concessions covering an area of 4,000 ha. This area will be made available for Fund activities.

19. It is proposed to carry out reconnaissance exploration over the CENTROMIN concession as well as over a potential geologically favourable area adjacent to the northeast for a total surface of about 34,500 ha.

Minimum Work

20. The objective of the project with respect to Area II will be the definition and selection of potentially mineralized zones and evaluation of qualitative parameters of mineralized outcrop.

21. Technical approach. Reconnaissance will be carried out by means of photogeological interpretation, geological mapping and geochemical stream sediment and soil surveys, followed by trenching and pitting. Mechanical equipment will be used wherever possible. Samples will be analyzed both locally and abroad as necessary.

22. The estimated net costs of executing the Minimum Work programme at Orquídeas is \$270,000. (Separate accounting of costs for individual areas will not be made.) The duration of field work will be about 12 months.

Subsequent Work

23. If the Minimum Work results are favourable, the exploration will continue with the objective of outlining an ore body with economic potential. Subsequent Work will include exploration technology appropriate for the given type of mineralization and may include further trenching and pitting, drilling and tunnelling.

III. Financial data

24. Revolving Fund allocation

	<u>Dollars</u>
Minimum Work	1 700 000
Possible additional expenditures for further activities following the Minimum Work	2 700 000

Total possible cost of the project	4 400 000

The financial assets of the Fund are adequate to meet the cost of the project.

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IV. Recommendation

11. In the light of the above, the Administrator recommends that:

The Governing Council,

(a) Take note of the approval by the Administrator of the Minimum Work for the project, Mineral Exploration for Base Metals and Gold in Peru (PER/NR/82/001), at a cost of \$1.7 million, as an obligation of the United Nations Revolving Fund for Natural Resources Exploration;

(b) Approve this project involving a total possible expenditure of \$4.4 million;

(c) Decide that this approval shall be cancelled unless the Government of Peru and the Fund shall have signed a project agreement within a period of nine months after the date of approval of the Minimum Work, it being understood that the Governing Council shall be notified of any such cancellation at the Council's first session after such action has been taken.

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