ARCHER, CATHRO
& ASSOCIATES (1981) LIMITED
CONSULTING GEOLOGICAL ENGINEERS

1016 - 510 WEST HASTINGS STREET
VANCOUVER, B. C. V6B 1L8
(604) 688-2568

EXPLORATION AND DEVELOPMENT OVERVIEW

MT. NANSEN PROPERTY

CARMACKS AREAS, YUKON

MARCH 20, 1988

Prepared by: Archer, Cathro & Associates (1981) Limited (Field Manager)

On Behalf Of: Chevron Minerals Ltd. (Operator), and

B.Y.G. Natural Resources Inc.

BOX 4127, 3125 THIRD AVENUE, WHITEHORSE, Y. T. Y1A 3S9
(403) 667-4415

GENERAL

The Mt. Nansen property is located in central Yukon, some 60 km by road west of Carmacks (see Figure 1 in pocket). It consists of 287 mineral claims and leases which cover a number of gold- and silver-bearing vein systems. The mineralization was discovered in 1943 and was explored by several groups before Mt. Nansen Mines Ltd. did extensive underground development and constructed a 300 ton/day mill in 1967 (see Photo 1). Underground mining was performed from September, 1968 to April, 1969 and again from January to May, 1976. Both operations were uneconomic because the mill lacked a cyanide circuit to handle oxidized, near surface mineralization, and could not produce a suitable sulphide concentrate from unoxidized ores.

Since June, 1985, Chevron Minerals Ltd. has spent $2.5 million exploring the property under an option from the present owner, B.Y.G. Natural Resources Inc. The two companies have recently modified their agreement to permit B.Y.G. to provide the next phase of financing and thereby earn at least a 69% working interest. Under proposed budgets and work schedules, Chevron will continue as project operator until at least the end of 1988.

Chevron's exploration has focused on oxidized mineralization that could be mined by open pit methods and from which most of the gold and some silver could be extracted by cyanidization. Results have been encouraging and work in 1988 is designed to provide geological, geotechnical, metallurgical and environmental data required for preparation of a feasibility study in fall 1988 and, assuming the study is positive, plant construction and production in 1989. The following sections summarize geology, reserves and metallurgy and probable mining and extraction techniques.

Photo 1: Mt. Nansen mill buildings with Huestis Vein surface workings and portals in background. Photo taken from Brown-McDade Zone facing west.

GEOLOGY, RESERVES AND PRELIMINARY METALLURGY

The Mt. Nansen area is one of the oldest precious metal camps in Yukon Territory. Placer gold has been produced intermittently from several creeks since the early 1900's, while precious metal veins have been explored since the 1940's. In 1988, at least nine placer operations either mined or performed extensive testing, while bulldozer trenching and/or diamond drilling was conducted on vein targets at the Nansen (Chevron and B.Y.G.), Goulter (Aurchem Ltd.), Vic (Kerr Addison Mines Ltd., Chesbar Resources Inc. and States Exploration Ltd.), Tawa (Chevron and Consolidated BRX Mining and Petroleum Ltd.), Robert (G. Dickson) and Rusk (Chevron and B.Y.G.) properties (see Figure 2 in pocket).

Nine major vein systems have been identified on the Mt. Nansen property and property-wide soil geochemical surveys suggest that others may be present in untested areas. The veins strike northwesterly, dip near vertically or moderately to the southwest, and cut a variety of metamorphic, granitic and volcanic rocks.

Moderately dipping veins are the primary open pit targets. They normally consist of a well defined footwall fault with a broad fracture zone developed in the hanging wall. The highest grade mineralization (>5 g/t Au) occurs in quartz flooded lenses along or directly adjacent to the footwall fault, while a lower grade halo (0.4 to 3 g/t Au) extends up to several tens of metres out into the fractured hanging wall. The Brown-McDade Zone (shown in Photo 2) is the most intensely explored target of this type and the only one for which significant reserves can be assigned. Based on trenches and widely spaced rotary percussion and diamond drill holes, Archer, Cathro calculated that

Photo 2: Brown-McDade Zone and main access road to the Mt. Nansen Property. Photo taken from a helicopter facing east.

NORECOL WATER QUALITY PARAMETERS FOR THE

MOUNT NANSEN PROJECT

Characteristics	Detection Limits
Temperature	field
pH	lab
Total Solids	
Suspended Solids	1 mg/l
Turbidity	0.1 NTU
Specific Conductivity	1 umhos
Total Hardness	1 mg/l
Total Alkalinity	1 mg/l
Sulfate	1 mg/l
Nitrate	5 ug/l as N
Nitrite	2 ug/l as N
Ammonia	5 ug/l as N
Total phosphorus	3 ug/l as P
Total Cyanide	1 ug/l
Total Mercury	0.05 ug/l
Total and dissolved	
Arsenic	1 ug/l
Barium	5 ug/l
Cadmium	0.2 ug/l
Copper	0.5 ug/l
Iron	5 ug/l
Lead	1 ug/l
Silver	0.2 ug/l
Zinc	0.5 ug/l

RESULTS OF 1985/86 WATER QUALITY DATA FOR THE MOUNT NANSEN PROJECT

Analytical results from four sampling periods are shown in Tables 1, 2, 3 and 4. On March 4, 1986 water was collected only from Webber Creek (W1) due to ice conditions and lack of water at the other sites; most sites were covered with 1-2 m of ice which was continuous to the creek bottom. Sampling was attempted at all sites except Victoria Creek (V1), Back Creek (B1) and Dome Creek (D2) which were observed from the air and judged to be similar to the other sites which had no flow. Webber Creek (W1) was sampled when groundwater recharge softened the ice.

Analytical results of the water samples collected by Norecol indicate the water in the Mount Nansen Project area is generally soft and slightly alkaline. However, water from the lower Huestis adit (A1) is hard, very alkaline, highly conductive, and high in total solids. Dome Creek receives water from the lower Huestis adit, and as a result exhibits similar hard, alkaline conditions. In fact, the upstream site on Dome Creek (D1) had higher conductivity, hardness and total solids than Site A1 during the October 11, 1985 (Table 1) and June 9, 1986 (Table 3) samplings, indicating additional dissolution of minerals.

Elevated levels for suspended solids occur in certain streams in the area, usually reflecting upstream placer mining activity. This is particularly prevalent during periods of peak runoff. Levels for suspended solids

were extremely high in Back Creek (B1) in June, 1986 (1 418 mg/l) and September, 1986 (965 mg/l) due to the close proximity of this site to placer mining activity. Elevated levels for suspended solids were also found at Site N1 (108 mg/l) in June, 1986, and at site V2 (322 mg/l) and W1 (363 mg/l) in September, 1986. The highest values occurred on June 9, 1986 during spring runoff, with the exception of B1 and N1 other values were at or below 50 mg/l.

Levels of nutrients were found to be highly variable in study area streams. Upper Dome Creek (D1) had elevated ammonia (0.104 - 0.342 mg N/l) and nitrates (0.117 - 0.223 mg N/l) on two occasions, Back Creek (B1) had elevated ammonia (0.119 mg N/l) on one occasion, and the lower Huestis adit (A1) had elevated nitrates (0.220 - 0.336 mg N/l) on two occasions. Sites A1, B1, D1 and P1 also showed slightly elevated levels of ammonia (0.026 - 0.081 mg N/l) and nitrate (0.021 - 0.096 mg N/l) on other occasions. Other nutrients such as nitrite had concentrations generally below detection limits. Although total ammonia itself is not considered a highly toxic substance, the un-ionized form of ammonia hydroxide is considered highly toxic. The concentration of un-ionized ammonia is highly dependent on pH and temperature. Acceptable concentrations are extremely low, with levels of 0.003 to 0.025 mg/l causing sublethal effects in trout and levels of 0.2 mg/l or more being acutely toxic. The safe level of nitrate for rainbow trout recommended by Westin (1974) is 6 mg/l, which is much higher than any values from the Mount Nansen Project area.

Background total phosphorus (TP) concentrations in undisturbed environments (e.g. site M1, V1) appear to range between <0.003 and 0.008 mg P/l. The highest TP concentrations (0.113 - 2.18 mg P/l) were measured in Back Creek (B1), the maximum level being recorded on June 9, 1986. The elevated TP levels in Back Creek are probably associated with sediments from placer mining. The effect of the TP loading to Victoria Creek from the Back Creek drainage was evident during the late summer at the lower Victoria Creek sampling location. Webber Creek also showed elevated TP levels (0.374 mg P/l) on September 4, 1986, probably contributing to the increase in TP between stations N1 (upstream) and N2 (downstream) on Nansen Creek. The higher TP concentration on June 9, 1986 at site N1 than at N2 on Nansen Creek suggest that there is an important upstream TP source entering the creek. The higher overall TP concentrations in late summer (September 4, 1986) rather than in late spring (June 9, 1986) probably reflected the reduced streamflows with continued placer mining.

Pony Creek was used for drinking water during the 1985/86 exploration program, and Minnesota Creek may be used in the future as a water supply. Therefore, the water quality results for Pony Creek (P1) and Minnesota Creek (M1) are compared to recommended drinking water standards (Appendix II). Since the recommended metal levels in Appendix II are based on total concentrations the total metal values presented in Tables 1, 3 and 4 are used as the source for comparison. These results indicate that Pony Creek had a slightly elevated level of cadmium on October 11, 1985. Both Pony Creek and

Minnesota Creek had elevated iron levels on all three occasions. These values ranged from 0.81 to 1.70 mg/l for Pony Creek, and from 0.81 to 0.94 mg/l for Minnesota Creek. The recommended level of 0.3 mg/l for iron is established for aesthetic reasons (staining) and is not a health consideration.

In order to assess the potential water quality effects on aquatic biota in the Mount Nansen area the water quality results at all sites are compared to guidelines recommended for protection of aquatic life (Appendix II). As with the drinking water standards, these guidelines are based on total metal concentrations, therefore, the total metal values appearing in Tables 1 to 4 were used for comparison.

Table 5 shows the range of values that exceeded the recommended guidelines at each site. Pony Creek (P1), which drains the Brown-McDade Zone, had the highest value of cadmium (0.0089 mg/l) and copper (0.19 mg/l) of all sites, and was very high in zinc (0.95 mg/l). Back Creek (B1) had the highest values of total phosphorus (2.18 mg P/l), arsenic (0.168 mg/l) and iron (45.5 mg/l) of all sites. In fact, the level of phosphorus was 87 times the permissible level and iron was 152 times the permissible level. The elevated levels of contaminants in Back Creek are related to the severe disturbance of the stream by placer mining operations both upstream and in the immediate vicinity of the water sampling site. Back Creek also receives water from Pony Creek which has high levels of certain heavy metals.