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AREA: Indian River

LONG.: 139 10'W

VALUE \$: 4200.00

CLAIM NAME & NO.: P29809-P29844

PL7238, 7245, 7260, 7471-72, 7607-11

WORK DONE BY: Ace Parker Mines & Minerals Corporation Ltd

WORK DONE FOR: Alcar Construction Ltd

DATE TO GOOD STANDING

REMARKS:

PLACER PROSPECTUS

("REDFORD PROJECT")

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ENGINEER'S REPORT
ON THE
PLACER GOLD POTENTIAL
AND
PROPOSED EXPLORATION
OF THE

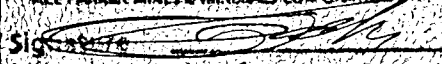
"REDFORD PROJECT"

KLONDIKE REGION, YUKON TERRITORY
CANADA

PREPARED FOR

ALCAR CONSTRUCTION LTD.

BY

PERMIT TO PRACTICE	
ACE PARKER MINES & MINERALS CORPORATION LTD.	
Signature	
Date	21 MAY 1987
PERMIT NUMBER: P 3325	
The Association of Professional Engineers, Geologists and Geophysicists of Alberta	

MAY 21, 1987

092080

This report has been examined by
the Geological Evaluation Unit under
Section 41 Yukon Placer Mining Act
and is recommended as allowable
representation work in the amount
of \$.....

Chief Geologist, Exploration and
Geological Services Division, Northern
Affairs Program for Commissioner of
Yukon Territory.

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S. R. Morrison

Chief Geologist, Exploration and
Geological Services Division, Northern
Affairs Program for Commissioner of
Yukon Territory.

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INTRODUCTION

This report has been commissioned by Mr. A. Osborne of 31 McDonald Road, Whitehorse, Yukon, who either owns or controls a group of gold bearing placer claims and leases situated along Ruby Creek and the Indian River in the Klondike Region of the Yukon Territory, Canada - otherwise known as the Redford Project.

The report is concerned with the practicalities of placer gold exploration with the primary objective of locating and defining auriferous deposits in a fashion that will allow the reliable calculation of proven, probable, and possible types of ore reserves for future open cast mining.

For the information of those critically minded persons in government and industry, this report is not intended to be an academic dissertation on the non-exact science of surficial or "bedrock" geology.

The author first examined the area in the early 1950's, and most recently in April of 1987 in the company of Messrs. A. Osborne and L. Becker.

SUMMARY OF FINDINGS

The Redford Project entails exploration of placer property in the Klondike region of the Yukon - for gold. Parameters pertaining to the project and included land package, along with a proposed exploration program and its estimated 1987 costs, are summarized in point form as follows:

- PROJECT LOCATION AND ACCESS

The project is situated in the Klondike region of west central Yukon Territory, Canada, and at coordinates 63°44'30" N. Latitude and 139°13'00" W. Longitude. Fifty (50) miles of road connect the project to Dawson, Yukon.

- PROPERTY AND OWNERSHIP

The subject property is composed of thirty-seven (37) placer claims plus ten (10) placer prospecting leases - all contiguous and covering approximately four thousand (4000) acres of mineral land. The property is in good standing at this time and no encumbrances are registered against it. The claims and leases have been acquired under the provisions of the Yukon Placer Mining Act and are privately owned.

- HISTORY AND CURRENT MINING ACTIVITIES

William "Billy" Redford prospected the area during 1893; and in 1905 Ruby Ellis of Readford, Yukon, discovered placer gold on what was to become known as Ruby Ellis Bench which forms part of the subject property. Although old timers mined placer gold along Ruby Creek during the 1920's, the property received very little attention until Mr. Al Osborne made a significant gold discovery along the lower reaches of Ruby Creek in 1986. Currently many placer properties (claims and leases) adjoin the subject property and a producing placer mine operated by Messrs. S. Schmidt and K. Tatlow is situated along its northern border.

- VEGETATION AND WATER SUPPLY

Periodic forest fires have destroyed most of the normal vegetation on the property. A few patches and strips of small spruce trees exist along Ruby Creek, but windfallen and charred trees in conjunction with a mixture of

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dwarf birch and willows cover most of the property. Ruby Creek crosses the property and the Indian River flows along its northern margin.

- REGIONAL GEOLOGY AND GEOMORPHOLOGY

Metamorphic rock of Precambrian age - primarily various kinds of micaceous schists and gneissic granite - dominate the region, but younger rocks (Eocene) including andesites, conglomerates, quartzites, shales, and minor coal seams underlie most of the property. These rocks have been cut by faults and fractures which largely control the local drainage pattern.

Land forms in the area include the valleys of Ruby Creek and the Indian River along with a large gravel terrace which lays along the south side of the Indian River Valley. The area has not been glaciated but is in a region of discontinuous permafrost. Small quartz veins formed in the andesites, schists, and shales carry gold values as do the conglomerates at some locations.

- SURFICIAL DEPOSITS (PLACER GEOLOGY)

A large gravel terrace (Ruby Ellis Bench) and reconcentrated deposits of stream gravel along Ruby Creek are the dominant surficial deposits on the property.

The gravels of Ruby Ellis Bench apparently were deposited by a large stream during Tertiary time in the center of an old channel which runs under the property for a distance of four miles. These terrace sediments vary from approximately twenty (20) to two hundred and fifty (250) feet deep and principally consist of orangish-red colored pebble and cobble-sized stratified gravels primarily of regional origin.

Little is known about the detailed internal geology of this terrace but it is known to be auriferous at several locations on surface, including along its top and northern edge, plus where it has been cross-cut by Ruby Creek. Evidence from recent mining pits in the Indian River Valley indicates that the sediments in the bottom portion of the terrace are somewhat altered and both coarse and fine placer gold are present in them in conjunction with iron-rich heavy sands.

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The gravel deposits which lay along the valley of Ruby Creek are primarily reconcentrated gravels that originated from Ruby Ellis Bench and, as such, are generally a composite assortment of the same alluvial materials. The gravel deposits along this Creek average approximately thirty (30) feet deep and are covered by a thin layer of black organic peat. Old timers mined gold from the gravels along Ruby Creek during the 1920's and a very significant discovery of placer gold (0.0555 oz/yd³) was made along the lower reaches of this Creek during 1986.

- ECONOMIC GEOLOGY (PLACER GOLD)

Samples of alluvial material from and immediately adjacent to the property reveal the presence of both coarse and fine gold of varying concentrations and types.

Some areas on top of Ruby Ellis Bench contain fine gold values in the range of 0.004 to 0.008 ounces per cubic yard at surface. Gold from this area is typically yellowish-orange in color and very fine-grained - approximately 100 to 200 mesh in size.

At one location on Discovery Claim near Ruby Creek where the Ruby Creek drainage system cuts through Ruby Ellis Bench, and at a point near the center of the geologic column of Ruby Ellis Bench, a sample of surface gravel yielded raw gold equal to 0.0555 ounces per cubic yard of gravel. The raw gold recovered along Ruby Creek is typically well-rounded and orangish-yellow in color. Some tiny crystalline forms were seen in the samples indicating that one portion of the gold was probably precipitated from solutions laden with gold ions. Individual gold specimens range from approximately 100 mesh sized grains to pieces with 4mm as their largest dimension.

During 1986, S. Schmidt and K. Tatlow recovered both coarse and fine gold from the bottom gravels of Ruby Ellis Bench but outside the subject property at a site on the south side of the recent valley of the Indian River where the auriferous bottom gravels of Ruby Ellis Bench are pinching off toward the north.

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It is reported that most of the gold recovered from this new mine site is well-rounded and flattish, but some specimens are "chunky" approaching the size of peas. Placer gold from this mine is associated with garnetiferous and iron-rich heavy sands. The auriferous deposits at this site have proven to be economically viable while employing a simple and probably inefficient gold recovery system, and it is estimated that they probably average in excess of five (5) dollars' worth of gold per cubic yard of gravel.

Generally, the placer gold from the top, middle, and the bottom sections of Ruby Ellis Bench plus the gold from Ruby Creek is all very similar in physical form and probably in purity. Raw gold from these deposits is believed to range from 750 to 800 fine (75% to 80% pure).

All of the raw gold is directly associated with varying amounts of heavy and iron-rich sand. The heavy sands consist of equal quantities of ilmenite and magnetite along with appreciable pinkish-red garnet.

The physical nature of the raw placer gold indicates that a large portion of it was precipitated from solution - possibly in a low energy drainage system working in a basin-like topographic environment over a long period of time.

- PLACER ORE RESERVES (AURIFEROUS GRAVELS)

- The property includes extensive deposits of Tertiary gravel which are known to carry auriferous values at several locations; including gold values of \$25/yd³ on Discovery Claim at Ruby Creek. However, in a strict engineering sense and because of the lack of quantitative data from samples, no Proven type ore reserves can be calculated for the property at this time.

It is calculated that 550,000,000 cubic yards of gravel exist on the property and that approximately 76,000,000 cubic yards of this material could be classified as Possible ore of an unknown tenor. Exploration drilling and bulk sampling is required before these reserves can be properly evaluated and classified as either Proven or Probable types of placer gold ore reserves.

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● GOLD PRICE/REFINING COST/MARKETING/TAXES

A gold price of 600 C\$ per fine ounce (444 US\$ per fine ounce) has been used in this report.

Refining costs vary with the requirements of the customer, but payment for 98 percent of the contained fine gold can be expected from some refineries for lots of one hundred ounces or more of raw gold.

Gold may be sold to a variety of buyers, but the Government of Canada charges a tax of 37 C\$ per 100 ounces of gold removed from the Yukon Territory.

● CONCEPTUAL REQUIREMENTS FOR A COMMERCIALY VIABLE PLACER GOLD MINE ON THE REDFORD PROJECT

Include:

- 1) Minimum Proven and Probable types of ore reserves
- 2) Reliable mining equipment, methods, and personnel
- 3) An efficient gravel processing and gold recovery plant

And:

A preliminary estimate of the expected Capital and Operating costs of a 500 yd³/hr mining operation along with the "break-even" tenor of ore reserves for a new placer gold mine on the Redford Project indicates that:

- Capital Costs	are	7,450,000 C\$
- <u>Operating Costs</u>	are	<u>2,350,000 C\$</u>
Total Costs	are	9,800,000 C\$

If equity is sold to provide funds to cover these costs from a new mine which recovers 91 percent of the raw gold while having a zero stripping ratio along with a 750 fine gold product which is 98 percent paid for by a refinery at the rate of 600 C\$ per fine ounce of gold, then the "break-even" tenor of ore reserves would be:

0.00533 raw oz/yd³, or \$2.40/yd³

(These figures indicate the probable maximum investment and minimum tenor of ore reserves necessary to establish a new 500 yd³/hr placer gold mine on the subject property.)

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● EXPLORATION OBJECTIVES AND TECHNIQUES

Include:

- 1) Determination of the location, quantity, and tenor of auriferous reserves - by large diameter drilling plus sampling of drill cuttings and assaying of sample concentrates.
- 2) Verification of drill-indicated gold values and their recovery - by bulk sampling and pilot processing with heavy earth moving equipment.
- 3) Determination of the physical nature and size gradations of the auriferous gravels - by screen analysis and physical tests of bulk samples.
- 4) Calculation of the quantity and tenor of auriferous reserves, plus their classification into Proven, Probable, and Possible types of ore reserves as per national standards - by employing empirical data collected on site (assays) plus detailed engineering analysis.

● SPECIAL CONSIDERATIONS

Include:

- 1) Government permits and approvals
- 2) Project design and layout
- 3) Civil survey of the property's perimeter
- 4) Project management and supervision
- 5) Camp facilities and food services
- 6) Timing of field work

● PROPOSED EXPLORATION PROGRAM AND COSTS

(An all-found drilling and bulk sampling program using contracted or rented equipment and facilities for four months and employing 104 persons directly or indirectly.)

Component or Item	Estimated Cost in 1987 C\$	Percent Cost
1 - Project Organization, et al	175,000	1.34
2 - Heavy Equipment Contracts	806,500	6.16
3 - Camp Complex, et al	126,500	0.97
4 - Sample Processing Plants	232,000	1.77
5 - Assay Office Complex	185,000	1.41

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Component or Item	Estimated Cost in 1987 C\$	Percent Cost
6 - Tanks and Meters, et al	60,000	0.46
7 - Fuel and Lube Oil	855,325	6.53
8 - Engineering and Office Equipment	31,500	0.24
9 - Office and Lab Supplies	41,000	0.31
10 - Electrical Power Generation Units	44,000	0.34
11 - Small Machines and Tools	17,500	0.13
12 - Consumables and Services	35,000	0.27
13 - Bridge (across Indian River)	72,000	0.55
14 - Food and Sundries, et al	289,800	2.21
15 - Freight and Travel	16,000	0.12
16 - Wages and Salaries, et al	2,142,360	16.35
17 - Communications, First Aid, and Fire Equip.	45,000	0.34
18 - Light Trucks and Vans	80,000	0.61
19 - Drilling - Percussion and Rotary Types - 135,000 Lineal Feet on Contract	2,710,000	20.69
20 - Bulk Sample Processing and Sizing Tests - 412,500 yd ³ on Contract	3,196,875	24.40
21 - Mobilization and Demobilization of Equipment, Supplies, and Personnel	1,089,060	8.31
22 - Administration and Management (for seven months)	137,400	1.05
23 - Consulting and Project Design, et al (for seven months)	375,000	2.86
24 - Contingencies and Escalation	337,180	2.57
TOTAL PROPOSED EXPLORATION EXPENDITURES - 1987	13,100,000	99.99

● CONCLUSIONS AND RECOMMENDATIONS

The Redford Project includes a large quantity of unexplored Tertiary gravel, zones of which have recently been discovered to contain economically viable gold values. Combined favorable geologic, economic, and technological conditions justify thorough exploration of the property at this time - preferably by drilling and bulk sampling as outlined in this report. The 1987 cost of the proposed exploratory work is 13,100,000 C\$.

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- CERTIFICATION

Ace R. Parker, P.Eng. (Mining) with 32 years' experience in the mineral industry.

- REFERENCES

Government and private sources plus personal mine operating experience - dated and listed herewith.

- COMMENT

The above noted points, et al, are more fully set out in the text of this report.

PROJECT LOCATION AND ACCESS

Project property has a coordinate location of 63°44' N. Latitude and 139°10' W. Longitude at a point twenty-three (23) air miles south-southeast of Dawson, Yukon, and approximately six (6) air miles north of Haystack Mountain in west-central Yukon. The region is best known as the Klondike and was the focus of a gold rush in 1898.

A majority of the placer claims straddle the lower reaches of Ruby Creek and adjoin a group of placer leases which cover a broad bench or terrace which runs along the left limit of the Indian River Valley, immediately upstream from the mouth of Ruby Creek (see Drawing No.'s 87-8-1 and 87-8-5 here attached).

The subject claims and leases adjoin placer leases on the west controlled by Indian River Gold Ltd. On the north, along Indian River, the subject property (leases) adjoin a block of placer claims currently being mined by Messrs. S. Schmidt and K. Tatlow (Ballarat/Tatlow Joint Venture).

Approximately fifty (50) miles of road (80% dirt-surfaced and open during summer months only) connect the property with Dawson, Yukon, which currently serves as a local supply and transportation center for most people in the area - particularly placer miners.

Scheduled airlines fly to Dawson five days each week and buses travel 340 miles south-southeast on the Klondike Highway during summer months to connect Dawson to Whitehorse, which is the Capital City of the Yukon.

PROPERTY AND OWNERSHIP

The subject property consists of one contiguous "V"-shaped group of placer claims and prospecting leases including thirty-six (36) standard placer claims and one (1) discovery placer claim, plus ten (10) rectangular-shaped placer prospecting leases. These placer claims and leases are recorded in the Federal Government office of the Mining Recorder at Dawson, Yukon, as follows:

<u>CLAIM OR LEASE NAME</u>	<u>CLAIM OR LEASE NUMBER</u>	<u>EXPIRY/RENEWAL DATE</u>	<u>OWNER REGISTERED WITH GOVERNMENT</u>
Placer Claim No. 1 through No. 36, incl.	P29809 through P29844 incl.	Sep. 25, 1987	Al Osborne
Discovery Placer Claim	P29938	Oct. 14, 1987	Al Osborne
1 Mile Prospecting Lease (Creek)	PL7472	Oct. 28, 1987	Al Osborne
1 Mile Prospecting Lease (1st tier bench)	PL7471	Oct. 28, 1987	Lloyd Becker
2 Mile Prospecting Lease (3rd tier bench)	PL7260	Dec. 31, 1987	Alcar Construction Ltd. by Power of Attorney to Al Osborne
3 Mile Prospecting Lease (2nd tier bench)	PL7245	Sep. 19, 1987	Daphne Becker
2 Mile Prospecting Lease (3rd tier bench)	PL7611	May 19, 1988	Gordon Woodley
4 Mile Prospecting Lease (4th tier bench)	PL7610	May 19, 1988	Kevin Elgie
4 Mile Prospecting Lease (5th tier bench)	PL7609	May 19, 1988	Lee Juniper
4 Mile Prospecting Lease (6th tier bench)	PL7608	May 19, 1988	Don Murphy
4 Mile Prospecting Lease (7th tier bench)	PL7607	May 19, 1988	Susan Murphy
2 Mile Prospecting Lease (3rd tier bench)	PL7604	May 19, 1988	Ray Fugard

Federal Government Placer Sheets (maps) No.'s 115-0-14b and 115-0-11h show the location of these claims and leases in relation to other placer properties in the area.

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The attached Property Location Map (Dwg. #87-8-5) portrays the claims and leases relative to topographic features, access roads, and active placer mines in the immediate area.

Aggregately, the claims and leases include approximately four thousand and forty (4040) acres (1635 hectares) of Crown land and have been located and recorded under the provisions of the Yukon Placer Mining Act.

The Yukon Placer Mining Act requires that annual assessment work (a form of property tax) be recorded on the claims and leases to maintain their ongoing validity. Annual assessment of two hundred dollars' (200 C\$) worth of work on an individual placer claim and one thousand dollars' (1000 C\$) worth of work per mile of prospecting lease qualifies the subject claims and leases for renewal.

Typically, exploratory work allowed on placer prospecting leases (for assessment purposes) includes such endeavors as drilling, pitting, trenching, bulk sampling, and shaft sinking by hand or mechanical means as approved by Government specifications.

Canadian law allows placer claims in the Yukon to be explored/prospected and mined, but placer prospecting leases can only be explored/prospected. However, the law allows placer prospecting leases to be converted into placer claims after the annual assessment work has been completed.

The placer claims and leases which are covered by this report are in good standing at this time, and to the best of my knowledge and belief no legal encumbrances of any kind are registered against the subject mining property.

HISTORY AND CURRENT MINING ACTIVITIES

William "Billy" Redford, born in Devon, England, was the first prospector to find gold along the Indian River in 1893. During 1894 Mr. Redford found and mined gold on Quartz Creek, a northern tributary of the Indian River but on the opposite side from Ruby Ellis Bench, the site of the subject property.

The Canadian Government opened a post office on Redford's discovery claim on Quartz Creek on August 19, 1905, to service a settlement that had grown up there since 1894. The postal station was first named "Radford" and later "Readford" until its final closure on December 31, 1952.

It is historically significant that Mr. Redford's find encouraged Robert Henderson to prospect the area, and that in early 1896 approximately twenty men worked for Billy Redford - one of them being Robert Henderson who was credited with being the first person to discover gold in the Klondike Region.

Considerable mining activity existed in the Indian River area prior to 1900 and by 1906 most of the tributaries of the Indian River were either being prospected or mined for placer gold as a result of the influx of people during the Klondike Gold Rush of 1898. During those years several hydraulic concessions were located along the lower reaches of the Indian River, including the ground at the mouth of Ruby Creek which was then called Garnet Creek.

During 1905 Ruby Ellis found gold on the large gravel terrace which extends along the left limit of Indian River immediately upstream from Garnet/Ruby Creek. This terrace became known as Ruby Ellis Bench. Also, the name of Garnet Creek was changed to Ruby Creek as it appears today on most Government maps - presumably being named after Ruby Ellis.

Attention was also being given to hardrock prospecting during the early 1900's. The McKinnon Brothers, Archibald and Donald, discovered the auriferous conglomerates on McKinnon Creek and attempted to develop the coal deposits on Coal Gulch, a tributary of Ruby Creek - all prior to 1915.

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Other than a few individuals, most early placer prospectors were inexperienced persons looking for "bonanza diggings" and concentrated their efforts in areas with rich pay and shallow ground. Although several streams which flow into the Indian River, including Quartz, Sulphur and Dominion Creeks, etc., were being mined at that time, most low level and low grade placer deposits such as those deposits known to exist along the center and lower reaches of Indian River, received little attention.

Mining activity in the Indian River area has fluctuated greatly since 1900, largely due to changing economics, the effect of World Wars, and the influence of Yukon Consolidated Gold Corporation which essentially monopolized mining in the Klondike Region until the 1960's.

Y.C.G.C. was headquartered on Bear Creek near Dawson and conducted extensive placer mining operations in the region, including dredging on some of the upstream tributaries of the Indian River. Apparently the gravel deposits situated along Ruby Creek and other gravel deposits in the middle and lower reaches of the Indian River, such as Ruby Ellis Bench, although known to be auriferous, were never tested by that Company.

However, it has been reported that limited small-scale hand mining was done on Ruby Creek during the 1920's by two Europeans. The recent discovery of significant placer gold along the left limit of this Creek by Mr. Al Osborne along with Lloyd and Daphne Becker seems to support the previous report of the presence of placer gold.

During the mid 1970's after the price of gold began to rise, placer mining activity began to increase in the Indian River area and by 1984 mining was being conducted in the Indian River Channel and along both limits of its lower valley approximately one mile below the mouth of Quartz Creek.

Alcar Construction Ltd. became interested in the placer gold potential of the Indian River at this time and conducted pilot mining operations in the Indian River Valley at a point 4200 feet downstream from the mouth of Quartz Creek during 1984. Fine gold was recovered but the operation was not viable due to the limitations of the processing plant being used.

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About that time Messrs. S. Schmidt and K. Tatlow became interested in the placer gold potential of the Indian River Channel below Quartz Creek and subsequently acquired a block of ground along the south side of the valley in the area between Ruby and Quartz Creeks. These men diverted the river around an oxbow bend near the toe of Ruby Ellis Bench and mined in the river channel. Approximately ten (10) feet of top gravel was wasted allowing mining of the auriferous, gray-colored bottom gravels. Both coarse and fine gold were recovered at this location during 1986 and ground is currently being stripped with two D9L bulldozers at the same site in preparation for mining during 1987.

The main valley of the Indian River is held under claim downstream for a distance of several miles below Quartz Creek and during march of 1987 prospecting leases were staked on four (4) left limit tributaries of Ruby Creek plus the intervening low level bench ground. A prospecting lease was also staked about the same time on the first left limit tributary of the Indian River immediately downstream from Ruby Creek. All of these leases were apparently staked by one consortium - presumably being based on the results of mining conducted during 1986 by Messrs. S. Schmidt and K. Tatlow, and discoveries made by Mr. Al Osborne and associates on the Redford Project.

VEGETATION AND WATER SUPPLY

Although the vegetation on the property is part of the Northern Boreal Forest Environment, the entire property has been subjected to periodic forest fires over a period of probably several hundred years resulting in the destruction of most of the larger trees in the area. Consequently, climax vegetation currently varies from one place to another on the property and is generally intermingled with fallen and firecharred trees - particularly on Ruby Ellis Bench along the south side of the Indian River.

Except for repeatedly burned areas such as on the Ruby Ellis Bench, most of the property is covered by a blanket of Sphagnum moss, Labrador Tea and minor Sedge grass along with a sparse growth of "brush" of various heights - namely dwarf birch, willows, and small poplar trees.

Small diameter black and white spruce trees once covered most of the property but currently such trees remain only along the lower valley of Ruby Creek, and upstream where they exist as a thin strip immediately along the Creek.

The Indian River flows (meanders) along the northern edge of the property and continues westward to empty into the Yukon River. This River flows on an approximate grade of 1.5 feet per mile, and carries in excess of four hundred (400) cubic feet per second which is ample water to supply the needs of several placer mining operations in the area.

Ruby Creek, along with two small tributaries which enter it from the southwest, is the only significant stream on the property. This stream flows at an estimated average rate of three (3) cubic feet per second and traverses in a northerly direction from the west flank of Haystack Mountain before emptying into the Indian River near the northwest terminus of Ruby Ellis Bench.

REGIONAL GEOLOGY AND GEOMORPHOLOGY

Numerous persons have geologically mapped portions of the region intermittently since 1900 but other than mapping by geologists employed by Yukon Consolidated Gold Corporation, the most comprehensive geologic map has been compiled by the Geological Survey of Canada based on the field work conducted during 1935, 1936, and 1937 by Dr. H.S. Bostock.

I have spoken to Dr. Bostock and his work in the area of the subject property is available to the public as G.S.C. Map 711A, Ogilvie, Yukon Territory. An extract of said map is attached to this report as Illustration Drawing 87-8-2.

Generally Precambrian basement rocks - principally granite, gneisses, quartzites, and schists of the Yukon Group, and Klondike schists, along with several stock-sized bodies of gneissic granite dominate the region.

However, Cenozoic (Eocene) quartz pebble conglomerate and lesser sandstone and shale, along with minor coal seams appear to underly the majority of the property. These rocks have been exposed in recent mining pits excavated along the left limit of the Indian River Valley immediately north of Ruby Ellis Bench and the subject property.

An exposure of auriferous, reddish-gray conglomerate exists along McKinnon Creek on the northeast flank of Haystack Mountain at a point approximately 3.5 miles southeast of the subject property. The conglomerates at this location have been the periodic target of exploration for gold - first in 1905 and at present.

Unfortunately these conglomerates and associated rocks are ninety-eight percent concealed by overburden on the subject property and can not be described in any detail. These rocks, along with intercalated andesites of the Carmacks Group, appear to be in fault contact with Yukon Group rocks along Ruby Creek.

The region has been subjected to major stresses, presumably resulting from tectonic and intrusive activity, resulting in local and regional uplift and subsidence of some areas, all in conjunction with extensive faulting and fracturing. The resulting "breaks" largely control the current drainage pattern in the region and may be described generally as being dendritic.

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It appears that much of the Indian River drainage system is part of a fault-controlled basin into which various types of sediments were deposited in Tertiary time.

The Eocene conglomerates represent one of many possible sources of the various forms and kinds of placer gold found in and along the Indian River Valley. Small quartz veins and disseminated mineralization with interstitial gold values formed in the basement rocks, particularly the schists, and represent an additional possible original source of the placer gold values.

From the standpoint of one possible theory for the formation and enrichment of the placer gold deposits, it is significant that a heat source existed in close proximity to the Indian River Basin in the form of volcanism. Andesites and rhyolites have spued from Haystack Mountain which is the picturesque remains of an old volcano.

However, the formation of large gold placers in most regions of the world, including the Klondike region, is far more complex than most people realize (see Economic Geology Section, this report).

The Klondike region, including the area of the subject property, has received glacial outwash but the region has not been glaciated. Consequently the land forms are principally related to bedrock geology and its resistance, along with that of the surficial materials, to erosional processes, et al, that have been going on since Tertiary time.

The project is in an area of discontinuous permafrost and this condition has also contributed to the resistance of erosion - particularly along north-facing slopes (ie: the south side of the Indian River Valley).

In the area of the subject property approximately twenty-four hundred (2400) feet of local topographic relief exists between the bottom of the Indian River Valley at the mouth of Ruby Creek, and the top of Haystack Mountain which stands at an elevation of 3751 feet.

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The Indian River is a mature stream and its valley is approximately three (3) miles wide near the mouth of Ruby Creek. The valley has a relatively dry and steep south facing slope on the north side of the valley as opposed to its north-facing south side which has a broad and gently sloping surface which is nearly flat on the terrace adjacent to the Indian River.

A broad but low-level Tertiary gravel terrace, known as the Ruby Ellis Bench, has formed along the south side of the Indian River Valley immediately upstream from the mouth of Ruby Creek. This terrace is technically a permafrost-defended terrace several miles long, and is known to be auriferous where covered by the subject property.

The only other significant land form covered by the property is the valley of Ruby Creek. This valley is a rather straight but shallow groove-shaped feature which strikes in a north-south direction and is progressively deeper toward the south near the western flank of Haystack Mountain.

SURFICIAL DEPOSITS (PLACER GEOLOGY)

The surficial deposits on the subject property consist of a large terrace of stream gravel situated along the south side of the Indian River Valley, and lesser deposits of recent stream gravels that have formed in the valley of Ruby Creek. A thin and irregular layer of colluvium covers the terrace gravels in contrast to the stream gravels of Ruby Creek which are overlain by a two (2) to five (5) foot thick layer of black organic peat ("black muck"). Because of their placer gold content, all of the gravel deposits are of interest and are described on the basis of limited information as follows:

- 1) RUBY ELLIS BENCH consists of a large gravel terrace in excess of four thousand (4000) feet wide which extends the full length of the property in an east-west direction. Near the northern edge of the property the brow of this terrace stands two hundred (200) feet above the floor of the Indian River Valley.

As is typical of stream action in permafrost areas, the Indian River has in recent times worn an inner valley along the north ("sunny") side of the overall valley of the Indian River while following a path of least resistance.

Consequently the Indian River has shifted its channel to the north from its former (Tertiary) position along the southern edge of the valley where Ruby Ellis Bench now exists. Thus this terrace remains as a tabular-shaped remnant or segment of the former (Tertiary) Indian River Channel and Flood Plain.

Except for limited exposures of the terrace gravels in mining pits currently being dug along the north edge/toe of the terrace (Ruby Ellis Bench) in the current channel of the Indian River, and several shallow trenches cut in the top of the terrace, no complete geologic column/section of this terrace is available for a detailed description.

However, the original Tertiary Indian River Channel, which flowed in the area that is now Ruby Ellis Bench, deposited a layer of gray-colored quartz-rich auriferous elements on bedrock (bottom gravels). These sediments are much

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like those gravels now found in the White Channel deposits but prior to their being extensively leached on or near bedrock by acidic groundwater and rendered nearly white as they appear along Bonanza Creek.

The bottom gravels of Ruby Ellis Bench have been found laying on bedrock in mining pits excavated at the toe of the terrace during 1986 by Messrs. S. Schmidt and K. Tatlow. These gravels are slightly altered and gray-colored stream gravels, are auriferous, and appear to continue into Ruby Ellis Bench.

It is most significant that no rock rim appears to exist in the current mining pits at the toe of Ruby Ellis Bench. Since this bench is a permafrost-protected gravel terrace, this suggests that the bedrock surface (bottom of the original channel of the Indian River) beneath Ruby Ellis Bench probably runs at the same or at a lower elevation than the bottom of the present Indian River Valley.

The gray bottom gravels in the current mining pits are poorly sorted and have proved to be economically viable (auriferous). These gravels seem to be structureless and vary from less than one (1) foot to more than seven (7) feet in thickness. These gravels principally consist of a mixture of rounded and subangular cobble and pebble-sized stones, and sand, all derived from rock types that exist in the Klondike Region - principally mica schist, and quartz, along with lesser granite gneiss. A small percentage of boulders up to two (2) feet in diameter are also present.

The heavy sands associated with the placer gold that has been recovered from this site are rich in garnets along with lesser magnetite.

Pits dug in the top portion (top gravels) of the old channel on Ruby Ellis Bench reveal alternating two (2) foot thick layers of well rounded and distinctly reddish-orange colored fine gravel and sand. All of this material is less than six (6) inches in diameter and approximately ninety-five (95) percent of the material is less than two (2) inches in diameter.

The clasts and matrix of these top gravels appear to be composed principally of various types of mica schist and quartz, whereas the heavy sands contain

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a roughly equal portion of garnet and magnetite. Fine gold is also present in these top gravels. The upper portion of the terrace gravels apparently was positioned above the highest ground water datum and thus alteration and leaching, as would be caused by the circulation of acidic water, is less prevalent in this horizon of the terrace.

Old timers dug pits along the north side slope of Ruby Ellis Bench midway between its brow and toe at a point opposite the current mining excavations in the channel of the Indian River. Unfortunately I have little knowledge of this work except to say that the material appears to be the same as that exposed in the trenches on top of the terrace.

- 2) RUBY CREEK DEPOSITS consist of a mixture of reconcentrated Tertiary stream gravels, as heretofore discussed, along with stream gravels of recent age. The oldest gravels were derived directly from the erosion of Ruby Ellis Bench at a location where it is crosscut by Ruby Creek. These old gravels dominate the deposits along the lower reaches of the Creek.

A Discovery Placer Claim (P29938) covering the lower reaches of a small left limit pup of Ruby Creek actually covers one portion of the southern edge of Ruby Ellis Bench at a location where Ruby Creek has crosscut the Bench. Appreciable placer gold values were recently found on this claim at a point approximately twelve hundred (1200) feet west of Ruby Creek, but upslope from the main channel of the Creek. This discovery appears to represent reconcentrated placer gold values originally contained in the top gravels of Ruby Ellis Bench near its southern edge. Thus the placer gold on lower Ruby Creek probably has little relationship with placer gold values that are reported to exist along the upper reaches of Ruby Creek, west and northwest of Haystack Mountain.

Stream gravels composed of granite gneiss, andesite, quartz pebble conglomerate, schist, and lesser shale - mostly cobble-sized and of local origin - make up the deposits along the upper reaches of Ruby Creek. Gravels containing these rock types have been deposited from Haystack Mountain to the mouth of this Creek.

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It has been reported that the gravel deposits along the upper reaches of Ruby Creek were successfully mined by two Europeans using hand methods in the late 1920's. Unfortunately little is now known about the nature of that project or the gold that was recovered from it.

The gravel deposits along Ruby Creek probably average approximately thirty (30) feet deep on the subject property but drilling will be required to determine the accuracy of this estimate.

As has been pointed out, significant placer gold has recently been discovered along the lower reaches of Ruby Creek and it appears that the area located downstream from Discovery Claim No. P29938 represents an ideal trap for placer gold values derived from both Ruby Creek and Ruby Ellis Bench.

ECONOMIC GEOLOGY (PLACER GOLD)

Specimens of raw placer gold that have been recovered from, or occur immediately adjacent to, the Redford Project and which are believed on the basis of geological and geophysical evidence to occur on the subject property, consist of a variety of sizes, shapes, and types of individual gold particles - some being in crystalline form. This gold has been deposited under different conditions - including precipitation from solution, and the most significant known occurrences of the gold along with their probable modes of deposition and possible origin are described as follows:

A) RUBY CREEK OCCURRENCES

Significant placer gold exists at surface in stream gravels deposited along a small, unnamed left limit pup (Discovery Pup - tributary from the west) of Ruby Creek. Gold was discovered along this pup at a point approximately one thousand feet west of Ruby Creek and twelve thousand feet south (measured in a straight line) of the confluence of Ruby Creek and the Indian River. Discovery Pup follows a relatively shallow gulch-like feature which has formed in orange-colored cobble and pebble-sized terrace gravels and is now covered by Placer Discovery Claim No. P29938.

The auriferous deposits on Discovery Claim lie principally at a position above the bottom of Ruby Creek Valley and appear to represent reconcentrated stream gravels which were originally deposited as a large terrace along the south side of the Indian River Valley prior to being crosscut in recent times by Ruby Creek. The gravels at this location appear to lie near the middle of the geologic column of Ruby Ellis Bench - the above noted terrace.

(See Surficial Deposits section of this report for a description of the gravel deposits on the subject property.)

Consequently, because of the superimposition of the modern drainage system upon the old (Tertiary) drainage pattern, most of the gold which occurs along the lower reaches of Ruby Creek and in the gravels of Ruby Ellis Bench appears to be largely of the same nature and origin.

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Placer gold recovered to this date from shallow excavations on Discovery Claim consists of a mixture of rounded and subangular specimens which range in size from 100 mesh sized particles up to small, flattened nuggets measuring 4 millimeters in their longest dimension. Most of the gold varies from a dull yellow to orangish or copperish-yellow in color. The purity of the gold is unknown but is expected to be in the range of 750 to 800 fine.

Some of the raw gold is slightly pitted and a few pieces - particularly those with a copperish-colored tinge - are striated. Although no inclusions of rock silicates were seen in the gold, several of the smaller particles have a crystalline form approaching that of octahedrons.

The gold is associated with equal amounts of pinkish-red colored garnets and black sand - principally magnetite and ilmenite. The gold and the heavy minerals associated with it in the surface gravels situated along Ruby Creek appears to have been deposited and/or reconcentrated by a low energy stream drainage system.

A one cubic foot (in situ) random sample of gravel taken from a six-foot deep bulldozer trench located alongside of a tote trail and approximately two hundred feet from the eastern boundary of Discovery Claim and within this claim yielded sixty-four (64) milligrams of raw gold. Since there are 27 cubic feet in a cubic yard and 31,103.48 milligrams in a Troy ounce, the recovered gold content of the sample translates into a tenor of 0.0555 ounces of raw gold per cubic yard of gravel.

This indicates a fine gold value of \$25 per cubic yard of surface gravel at this location while assuming a fineness of 750 and a gold price of 600 C\$ per fine Troy ounce. This value may or may not be representative of the gravels which underlie Discovery Claim. However, this gold discovery is very significant when appreciating that the largest concentration of placer gold usually occurs on bedrock and that the deposits in this area have been sampled only on surface where no bedrock is visible.

It has been reported that placer gold was recovered from the upper reaches of Ruby Creek annually for a period of several years prior to 1930. Unfortunately this writer has no detailed knowledge of this enterprise except to note that the mining was done by hand methods at a time when gold was priced at \$20.67 per fine ounce.

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Gold in this upstream area, plus some of the gold along the lower reaches of Ruby Creek, could have originated from hard rock deposits in the vicinity of Haystack Mountain (including the auriferous quartz pebble conglomerates), or from destruction/reconcentration of a southern segment of the large terrace deposit (Ruby Ellis Bench) now situated along the south side of the Indian River Valley.

B) RUBY ELLIS BENCH AND IMMEDIATE VICINITY

Placer gold exists at surface along the top and north-facing slope of Ruby Ellis Bench (a permafrost-protected terrace). The gold present in the upper horizons of this terrace is very fine and ranges in approximate size from 100 to 200 mesh. The gold is associated with heavy, iron-rich sands - principally magnetite and ilmenite. Most of this gold is yellowish-orange in color and under magnification is seen to be flattish and pitted.

Small samples of surface gravels taken from bulldozer trenches returned gold values in the range of 0.004 to 0.008 ounces of raw gold per cubic yard of gravel. However, because of the large area involved, hundreds of samples will be necessary to assess the true value of this deposit. Small, shallow samples taken at surface can not be considered to be representative of the overall deposit and only serve to indicate the presence of gold at the particular sample site.

"Old Timers" dug a series of pits on top of Ruby Ellis Bench and along its northern "face" - upslope from the present channel of the Indian River. It is reported that this work was done prior to 1910 and that fine gold was recovered from several separate horizons of the bench. Unfortunately the exact amount of gold recovered or the average tenor of these top gravels is unknown to this writer. It appears from the distribution and location of the Old Timers' excavations - particularly upslope from Schmidt and Tatlow's open pit mine - that some of the horizons of this large terrace carry more placer gold than others.

Little is known about the bedrock profile under Ruby Ellis Bench but the auriferous gravels currently being mined along the northern toe of the bench appear to extend south under the bench, and pinch off toward the north under

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the present channel of the Indian River. This suggests that the deepest part of the old channel, and thus probably the largest concentration of placer gold, lies under Ruby Ellis Bench and not under the present channel of the Indian River. (Refer to Dwg. #87-8-4, Geological Cross Section "A-B".)

During 1986, S. Schmidt and K. Tatlow recovered both coarse and fine gold from the bottom gravels of Ruby Ellis Bench at a site along the northern toe of this bench in the bed of the Indian River and outside of the boundary of the subject property.

It is reported that most of the gold recovered from this site is well-rounded and flattish in nature. Some specimens are said to be quite "chunky" and approach the size of peas. The gold is associated with garnetiferous and iron-rich heavy sands. The deposits being mined are gray-colored, altered gravels which have a maximum depth of seven feet along the south side of the mining pit and probably average in excess of five dollars' worth of fine gold per cubic yard.

This gold is believed to be representative of the type of gold that can be expected in the bottom gravels of Ruby Ellis Bench. However, drilling will be required to determine both the concentration and distribution of said gold.

Because of the nature of the gravels which make up Ruby Ellis Bench, and to a lesser extent the nature of the raw gold itself - particularly the presence of small crystals of gold - there is a reasonable possibility that the bottom one-third portion of the bench was subjected to alteration and enrichment processes entailing a cycle of leaching and liberation of metal ions, plus mobilization and precipitation/deposition of gold from solution. Such gold could have originated from fine placer gold particles contained in the upper horizons of the original sedimentary deposits which now remain as terrace deposits along the Indian River Valley, or from hardrock mineral deposits, et al, in the region that was being drained by the Indian River in Tertiary times.

The majority of hardrock sources of gold were probably sulfide mineral occurrences of various sizes, but probably consisted principally of disseminated mineralization contained in the country rocks of the region. An environment

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for the generation of sulfuric acid existed when these deposits were subjected to a combination of ground, juvenile, and meteoric water. Subsequently, the percolation of these acid waters caused the liberation and mobilization of metal ions - including gold.

The presence of carbonaceous material, local differences in the earth's electromotive potential, and abrupt changes in the Ph values of solutions caused precipitation and deposition of the gold ions in various forms - including dendritic growths on siliceous rocks, plating on other gold particles, and the formation of distinct gold crystals.

A cycle of liberation/mobilization/deposition of gold would have been especially active under "settling pond" conditions, and a warm, humid climate as existed in the Klondike region during part of Tertiary time.

It is significant that what is now the Indian River Valley probably once contained a structurally-controlled intermontane basin into which auriferous sediments were deposited during Tertiary time. Although the basin was eventually drained due to a combination of regional uplift in conjunction with downcutting by the Indian River to give land forms as may be seen today, it served as a large settling pond for auriferous sediments and metaliferous waters - undoubtedly containing ions of gold liberated from hard rock sources in the region by the action of acidic waters.

A geothermal source adjacent to the Indian River Basin, such as volcanism which existed at Haystack Mountain, could also have stimulated the circulation of metal-laden ground or meteoric water, thus increasing the probability of gold being carried in, and precipitated/deposited from, solution.

Although generally not appreciated in the Klondike region, there is nothing new about the enrichment of placer gold deposits by gold being precipitated/plated from solution. Such processes were recognized by people working in the mineral industry in California prior to 1900, and in the White Channel gravels of the Klondike region by F.J. Jenkins during the 1950's.

It is significant that the majority of placer gold produced in the world has been recovered from streams with a grade of less than twenty feet per mile. Coarse gold will not normally travel on such a low grade unless it is on ice. The movement of gold in a simple sluice box demonstrates that coarse gold

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will not move far or readily over a gently-inclined or nearly flat surface - especially if restrictions are present. Consequently a major portion of placer gold had to be deposited in a totally different manner - namely from solution. This is probably true in the Klondike as is the case in Alaska, California, and South America.

Because of the direct association of the raw gold in the surficial deposits on the subject property with magnetite, it may be possible to trace some zones in the auriferous paystreaks with sensitive and carefully controlled magnetic surveys. In this regard it may be significant that a Government sponsored aeromagnetic survey of the area shows a slight (less than thirty gammas) increase in magnetic readings over Ruby Ellis Bench and its extension to the east and west along the south side of Indian River Valley. The magnetic readings increase over the apparently thickest portions of the surficial deposits and suggest the presence of an irregularly-shaped and structurally-controlled basin extending from a position one mile below the mouth of Ophir Creek, then up the Indian River Valley past McKinnon Creek for a total distance of approximately twelve miles.

Such a basin could have received the mineral-laden waters - including gold ions - carried down the Indian River from Quartz, Sulphur and Dominion Creeks and as such could have provided an environment for the enrichment of fine-grained placer gold particles that were originally transported into the basin as water-borne sediments. Similar enrichment processes appear to have increased the placer gold content of the bottom portion of the White Channel gravel deposits and the auriferous bottom gravels of the Klondike River Valley near Dawson which were largely mined out prior to 1960.

PLACER ORE RESERVES (AURIFEROUS GRAVELS)

The subject property covers extensive surficial deposits, essentially Tertiary gravels, which vary from a few feet to more than two hundred (200) feet in thickness. Although these deposits are known to be auriferous at several points, insufficient data exists at this time to allow calculation and classification of the geologic reserves into Proven Ore or a significant volume of Probable Type ore reserves.

However, a small volume of Probable Type ore reserves exists along Ruby Creek, and a relatively large portion of the gravels contained in Ruby Ellis Bench can be classified as Possible Type ore reserves on the basis of geologic information and gold production from an adjacent mine.

Estimated quantities of gravel present on the subject property, along with that portion of these deposits which is geologically indicated to be auriferous at this time, have been listed for purposes of project visualization (size, etc.) as follows.

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GEOLOGIC RESERVES - ESTIMATED QUANTITIES

DESIGNATED PROPERTY AREA (CLAIMS & LEASES)	SURFACE AREA (YD ²)	AVERAGE DEPTH (YD)	CUMULATIVE VOLUME OF GRAVEL (YD ³)
RUBY CREEK GROUP	5,826,000	7.91	46,115,000
ELLIS BENCH GROUP	12,600,000	40.00	504,000,000
TOTAL "A"	18,426,000	N/A	550,115,000

DESIGNATED PROPERTY AREA (CLAIMS & LEASES)	VOLUME OF GRAVEL (YD ³ x10 ⁺³)	SURFACE AREA OF AURIFEROUS GRAVEL (YD ² x10 ⁺³)	DEPTH OF AURIFEROUS GRAVEL (YD)	RESERVE CLASSIFICATION	
				AURIFEROUS GRAVELS (YD ³ x10 ⁺³)	NON-AURIFEROUS GRAVELS (YD ³ x10 ⁺³)
RUBY CREEK GROUP	46,115	1,375	12.3	16,925	29,190
ELLIS BENCH GROUP	504,000	2,800	60.0	168,000	336,000
TOTAL "B"	550,115	4,175	N/A	184,925	365,190

DESIGNATED PROPERTY AREA (CLAIMS & LEASES)	VOLUME OF POTENTIAL ORE (YD ³ x10 ⁺³)	DEPTH OF MINING SECTION (YD)	RESERVE TYPE & VOLUME (1)			
			PROVEN ORE (YD ³ x10 ⁺³)	PROBABLE ORE (YD ³ x10 ⁺³)	POSSIBLE ORE (YD ³ x10 ⁺³)	WASTE MATERIAL (YD ³ x10 ⁺³)
RUBY CREEK GROUP	16,925	5.0	NIL	25	6,855	10,045
ELLIS BENCH GROUP	168,000	25.0	NIL	NIL	70,000	98,000
TOTAL "C"	184,925	N/A	NIL	25	76,855	108,045

NOTE: (1) MORE THAN NINETY-NINE (99) PERCENT OF THE POTENTIALLY AURIFEROUS RESERVES CAN BE CLASSIFIED ONLY AS BEING POSSIBLE TYPE ORE RESERVES AND THUS NO ESTIMATE OF TENOR CAN BE GIVEN AT THIS TIME.

GOLD PRICE, REFINING COSTS, MARKETING, AND TAXES

The price of gold is currently hovering around six hundred (600) Canadian dollars per Troy ounce, and there appears to be little chance of the price falling below four hundred (400) United States dollars per ounce in the next two (2) year period. Some foreign analysts are speculating on a one thousand (1000) dollar per ounce price for gold by 1990, but only time will tell if this possibility is true as the price of gold appears to be a function of "fear" as much as hard core economics.

Raw gold or bullion may be refined by the operating company on site, or by commercial refiners and is easily transported regardless of where it is produced. Gold commands high respect from most financial institutions of the world. It also serves as excellent collateral.

Refining costs include charges for assaying, melting, pouring, handling, etc. and vary slightly with the refiner. A typical cost is in the range of twenty (20) to thirty (30) dollars per resulting ounce of gold depending on the refinery, its location, and the size of the shipment, bar size, etc. However, if the producer is merely selling his gold to a refiner, he can expect to receive payment equal to ninety-eight (98) percent of the contained fine gold content on shipments of one hundred (100) ounces or more.

Both raw and refined gold may be sold to a variety of buyers including Government mints, metal brokers, refining companies, and jewellers based in North America and elsewhere in the world.

Some people regard gold as the ultimate in material wealth and hoarding is common. Unfortunately gold accumulates no interest in its metallic form, but on the other hand the producer pays no income tax on his product unless the gold is converted (sold) into currency.

The Government of Canada has levied a gold tax of thirty-seven (37) dollars per one hundred (100) ounces of gold produced when declared and/or removed from the Yukon Territory. This tax is a minimal charge and is not likely to be increased in the next two (2) year period.

CONCEPTUAL REQUIREMENTS FOR A COMMERCIALY VIABLE
PLACER GOLD MINE ON THE REDFORD PROJECT

Several important factors must be addressed before an economically viable placer gold mine can be established on the Redford Project. The most critical items are noted as follows:

- 1) Minimum Proven Type Ore Reserves (auriferous gravels) must be established by exploration drilling and bulk sampling to offset estimated Capital and Operating Costs, and which upon mining will meet the profit demands of the operating organization. Although the quantity of Proven Type Ore Reserves will vary with their tenor as indicated by drilling, when considering risks, costs, etc., exploration should strive for a minimum target of one hundred and fifty thousand (150,000) ounces of fine gold contained in Proven plus Probable Type Reserves to serve as the base for a new placer gold mine on the project.

- 2) Preferred mining methods and equipment which yield maximum productivity and a minimum unit cost per cubic yard excavated/mined should be selected and employed during the bulk sampling program - thus providing a pilot mining project around which a full scale mining operation can be designed.

Generally, large equipment (i.e. large bulldozers) can move muck/ore more economically than smaller units. However, it is equally as important to ensure that all associated machinery is matched in terms of production capacity.

- 3) A gravel processing and gold recovery plant which recovers a minimum of ninety percent (90%) of the contained placer gold should be used. Most commercial sluice boxes seldom recover more than seventy percent (70%) of gold and recovery usually falls drastically when attempting to recover gold that is finer than one hundred (100) mesh in size.

In view of the current price of gold and the probability that most of the placer gold on the project is expected to be relatively fine (40% minus 65 mesh (?)) a processing plant equipped with a trommel screen and circular jigs (Cleveland type) will undoubtedly be required to recover ninety-five percent (95%) or more of the placer gold.

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A PRELIMINARY ESTIMATE OF THE EXPECTED CAPITAL AND OPERATING COSTS
OF A NEW 500 CUBIC YARD PER HOUR MINING OPERATION
PLUS THE "BREAK-EVEN" TENOR OF NECESSARY ORE RESERVES

Although more than one mining operation may eventually be justified on the Redford Project, an indication of the equipment and facilities required for a new mining operation and an estimate of their cost is presented as follows.

I CAPITAL COSTS

<u>Items and/or Units, Et Al</u>	<u>Estimated Cost in 1987 C\$</u>	<u>Percent Cost</u>
A) Camp and Mine Support Facilities/Structures, including camp complex for 40 persons, office, shop and warehouse, plus electric power, water supply and sewage treatment equipment/facilities (purchase, delivery, and installation of new items)	875,000	11.7
B) Primary Mining Equipment, including 350 and 700 HP class dozers c/w blades and rippers, plus 400 HP class hoe excavator (purchase and delivery of new items)	2,455,000	33.0
C) Mine Support Equipment, Materials, Spare Parts, Tools and Supplies, including equipment, tanks and fixtures, electrical generating sets and wiring, flood lights, pipe and valves, spare and wear parts, tools, et al, and assay chemicals, and one reconditioned road grader (purchase and delivery of principally new items)	715,000	9.6
D) Concentrating Plant and Accessories (custom fabricated and portable plant for the recovery of coarse and fine gold) including dozer trap, head and tail conveyors, feeders, chutes, screens, circular jigs, bins, cyclones, tanks, pumps, pipe, electric motors and wiring, structural steel, etc. (purchase, delivery, and installation of new items)	2,685,000	36.0
E) Assay and Concentrate/Gold Processing Equipment, including analytical balances, conveyors, bins, feeders, glassware, scales, screens, shaking tables, retort, melting furnace, gold molds, etc. (purchase and delivery of new items)	335,000	4.5

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Items and/or Units, Et Al	Estimated Cost in 1987 C\$	Percent Cost
F) Contingencies and Escalation	385,000	5.2
SUBTOTAL, CAPITAL COSTS	7,450,000	100.0

II OPERATING COSTS

(Estimated expenditures covering administrative and operating charges for two 12-hour shifts working six days each week for a total of one hundred (100) net production days or one hundred and twenty (120) camp residence days each year after allowances for lost time and annual head office charges)

Items and/or Units, Et Al	Estimated Cost in 1987 C\$	Percent Cost
A) Administration, Management and Operating Overhead, including town office rental, office supplies and services, accounting and audit, all types of insurance, legal costs, printing and reports, government and professional fees, communications, freight and travel (periodic purchases)	375,000	15.9
B) Food and Subsistence for 30 persons per day for 120 camp residence days (periodic purchases)	95,000	4.0
C) Fuel (all types) and Lube Oil, including - diesel fuel @ 80 gal/hr - gasoline @ 1 gal/hr - lube oil @ 1 gal/hr - propane @ 1 lb/hr (monthly purchases and delivery to job site)	648,000	27.6
D) Maintenance and Repairs, et al, including acetylene and oxygen, bucket teeth, corner bits, welding rod, cutting edges, bolts, ripper teeth, pump liners, rubber belting, fuel filters, hydraulic hoses, paint and laboratory chemicals and supplies, etc. (periodic purchases)	115,000	4.9
E) Salaries and Wages, et al, including pay for project operating personnel for 105 paid production days c/w incentive bonuses, payroll burden and overtime pay for 12-hour shifts, plus pay for the general manager, town office staff, and skeleton crew/watchman for the mine during the "off-season" (periodic expense)	885,000	37.7

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Items and/or Units, Et Al	Estimated Cost in 1987 C\$	Percent Cost
F) Contingencies and Omissions	232,000	9.9
SUBTOTAL, OPERATING COSTS	2,350,000	100.0
TOTAL PRODUCTION COST (I + II) (Exclusive of Exploration Cost)	9,800,000	N/A

The Capital and Operating costs of a new mine on the Redford Project could be financed by selling equity in the project/property. The "break-even" tenor for ore reserves under that financial arrangement would be as follows:

The approximate cost per cubic yard mined and processed during the first production year and with a zero stripping ratio would be:

$$\text{\$2,350,000 per year} / 1,100,000 \text{ yd}^3 \text{ per year} = \text{\$2.14/yd}^3$$

However, there are other circumstances that must be accounted for, and if we may assume that:

- 1 - Gold is priced at 600 C\$/fine ounce;
- 2 - The raw gold is 750 fine (75% pure);
- 3 - Ninety-one (91) percent of the gold is recoverable; and
- 4 - A refinery, etc., pays for 98 percent of the fine gold contained in the raw gold product;

Then it follows that:

The "break-even" tenor for mining with a zero stripping ratio during the first production year is:

$$\text{\$2.14/yd}^3 = (600 \text{ C\$/fine oz}) (0.75) (0.91) (0.98) (x \text{ raw oz/yd}^3)$$

$$\text{OR, } x = 0.00533 \text{ raw oz/yd}^3; \text{ OR, } 0.00399 \text{ fine oz/yd}^3.$$

Similarly, at 31,103.48 milligrams/Troy ounce, $x = 165.85 \text{ mg raw gold/yd}^3$,
OR, at $27 \text{ ft}^3/\text{yd}^3$, $= 6.14 \text{ mg raw gold/ft}^3$.

Again, with gold at 600 C\$/fine ounce and a 750 fine gold product, the necessary "break-even" tenor (x) for ore reserves under the circumstances and conditions noted herein is: $\text{\$2.40/yd}^3$.

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At an annual production of 1,100,000 yd³/season, this means that a minimum of approximately 4,400 fine ounces of gold must be produced each season.

When considering the numerous variables which undoubtedly will affect a new mining operation on the subject property in the future, including the price of gold, fuel and labor costs, changes in stripping ratios, and profit requirements by the future mine operator, etc., it is not unreasonable to set a minimum exploration objective of 150,000 fine ounces of gold on the Redford Project.

EXPLORATION OBJECTIVES AND TECHNIQUES

Any meaningful and practical exploration program for placer gold on the subject property must strive to achieve certain important objectives. The techniques employed in reaching these objectives verge on being critical in the ultimate success or failure of the exploration program and must be appreciated at the outset of the work to ensure progressive elimination of risks while allowing a reliable evaluation of the property.

The more important exploration objectives, along with the applicable and inter-related techniques/tools necessary for the successful exploration of the Redford Project, are listed as follows:

- 1) Determination of the location, quantity, and tenor of auriferous gravels, because of the thickness of these surficial deposits and the probability of the placer gold values being concentrated on or within a few feet of bedrock, can be accomplished most economically and expediently by drilling. However, drill holes should not be less than six (6) inches in diameter and should be punched in a manner that will provide a constant sample volume. (Refer to Sensitivity Graph - Drawing No. 87-8-3.)

Since much of the ground is relatively deep, a strong drill, preferably equipped with an eccentric/"knuckled" bit (Neptune or Odex drilling system) and capable of punching two hundred and fifty (250) foot deep holes is best suited for this work.

Such a machine is equipped with a "down the hole" hammer and a counter rotating casing system which allows bedrock and the largest boulders to be penetrated without interruption while the drill cuttings are being continuously returned to surface from within the drill casing. This technique assures minimum dilution and contamination of the samples while maintaining a constant sample volume. Also, each drill hole should be driven six (6) feet into bedrock.

Under summer operating conditions, the drilling equipment/system noted herein should maintain an average productivity of approximately fifteen (15) feet per hour including moves between drill holes.

All drill cuttings should be collected at three-foot long intervals from each drill hole by using a cyclone equipped with a "flop gate" and two (2) sample chutes. Each sample should be carefully logged at the drill to ensure that all significant geologic data is recorded at the earliest possible time - including a check on the volume of each sample being recovered.

A bank of small mechanically driven screens and panning-type devices should be used to reduce each sample and recover a concentrate of heavy minerals and gold for inspection at the drill. Subsequently, each sample of concentrate should be carefully bottled, labelled, and sent to a lab on site for analysis, and amalgamation assay to determine the placer gold content.

An Engineer or Geologist should be placed in direct charge of the drilling and sample processing program. Also, it will be advantageous to mount the cyclone and sample reduction/concentration equipment, including provisions for recirculation of water, in a single trailer-type building sufficiently strong enough to be repeatedly moved between drill sites.

Drill lines can be cut with a bulldozer, and initially they should be placed approximately three thousand (3000) feet apart and positioned at nearly right angles to a particular deposit (Stage "A" Drilling).

The respective drill holes should be spaced at one hundred (100) foot intervals along individual drill lines. The same spacing between drill lines applies to property both on Ruby Ellis Bench and along Ruby Creek.

All drill lines should be connected with bulldozer trails to provide easy access and tied to a common baseline which is referenced to a perimeter survey of the property and the Indian River Baseline.

After the initial drill lines have been drilled off (Stage "A" Drilling), additional lines of drill holes (Stage "B") should be drilled midway between the initial drill lines resulting in drill lines being spaced at fifteen hundred (1500) foot intervals in areas deemed promising for placer gold on the basis of results from the holes drilled on the initial wide-spaced drill lines.

At this stage a sensitive survey of the vertical component of the earth's magnetic field should be conducted along individual drill lines to determine if there is any correlation between the magnetite that is associated with the placer gold and any paystreaks as indicated by the first drill results. This kind of a survey is relatively inexpensive and would possibly allow detailed mapping of any particular paystreak with a minimum of drilling.

Also at this stage, and to take full advantage of the time necessary to thaw the frozen gravel, a program of stripping could be started in preparation for bulk sampling/pilot mining and sizing tests - if justified.

An additional stage of drilling should be conducted in areas of significant placer gold values as revealed by the results of the first two stages of drilling. This drilling (Stage "C") would result in drill lines in a particular area being spaced five hundred (500) feet apart. These drill lines, although important, would be classified as "fill-in lines" and as such would normally be shorter in their length and number of drill holes than the lines previously drilled. During this stage of drilling a few holes should be drilled in between the drill lines to check the continuation and continuity of the paystreaks between drill lines. (See Page 42.)

Upon completion of the three stages of drilling and sampling it will be possible to calculate drill-indicated reserves of the Proven, Probable, and Possible Type. However, to be totally confident in the economic viability of these reserves, and to allow them to serve as the basis of a bankable feasibility study, they should be bulk sampled.

- 2) A bulk sampling program, if justified on the basis of drill results, should be initiated as soon as possible to verify the existence and especially the recovery of the contained placer gold values. This work will also allow a correlation to be made between the quantity of gold contained in drill-indicated reserves and the amount of gold that can be recovered from mining the same deposits.

It is important that the bulk sampling/pilot mining program be conducted in a manner and with equipment that is expected to be used in a full-scale mining operation.

A representative section of pay gravel and bedrock from all types of pay-streaks should be processed with particular attention being paid to gold recovery. All work should be closely monitored and documented by an Engineer or other person that is qualified by experience.

- 3) The physical nature of the pay and waste gravels should be determined and documented. Sizing and screen analysis can best be conducted in conjunction with the bulk sampling program but these tests can also be conducted separately.
- 4) Auriferous reserves can, on the basis of drill results and bulk sampling/pilot mining, be calculated and classified into Proven, Probable, and Possible Type ore reserves along with their respective tenors as per national standards. This work can best be done by a person or persons who are familiar with both the drilling and bulk sampling programs - preferably a Mining Engineer.

TENTATIVE DISTRIBUTION OF DRILLING ON THE REDFORD PROJECT DURING 1987, ALONG WITH RELATED STATISTICS PERTAINING TO THE DRILLING HAVE BEEN SUMMARIZED AND TABULATED AS FOLLOWS:

DRILLING STAGE AND DETAILS	PROPERTY AREA DESIGNATION	
	"RUBY CREEK GROUP" (1)	"ELLIS BENCH GROUP" (2)
STAGE "A" (Primary Drilling)		
- Number of Drill Lines	11	6
- Cumulative Length of Drill Lines (ft)	21,200	30,200
- Cumulative Number of Drill Holes	190	290
- Average Depth of Drill Holes (ft)	54.4	174.8
SUBTOTAL - Footage of Drilling / Stage "A"	10,340	50,700
STAGE "B" (Secondary Drilling)		
- Number of Drill Lines	11	7
- Cumulative Length of Drill Lines (ft)	21,200	18,120
- Cumulative Number of Drill Holes	190	167
- Average Depth of Drill Holes (ft)	54.4	185
SUBTOTAL - Footage of Drilling / Stage "B"	10,340	30,895
STAGE "C" (Fill-In Drilling)		
- Number of Drill Lines	22	4
- Cumulative Length of Drill Lines (ft)	31,800	7,400
- Cumulative Number of Drill Holes	296	72
- Average Depth of Drill Holes (ft)	65.3	186.2
SUBTOTAL - Footage of Drilling / Stage "C"	19,320	13,405
SUBTOTAL - DRILLING BY PROPERTY AREA	40,000 FT	95,000 FT
Total Number of Drill Lines	61	
Total Length of Drill Lines (miles)	24.6	
Total Number of Drill Holes/Sites	1,205	
Average Depth of Drill Holes (ft)	112	
TOTAL DRILLING - 1987, ALL STAGES	135,000 FT	

Notes: (1) Property along and west of Ruby Creek
(2) Property on Ruby Ellis Bench

SPECIAL OPERATING CONSIDERATIONS

All future work on the Redford Project must pay particular attention to several key factors to ensure maximum operating efficiency and return on investment. Some of these factors are noted as follows:

- 1) Government Permits and Approvals must be in place before some of the work can be done, i.e.: water use permits for sample processing. Permits must be applied for in advance of actually doing the work.
- 2) Project Design and Layout must be well thought out in advance by competent, reliable people - although not necessarily engineers or geologists. All work should be tied to a common baseline.
- 3) Survey of the Property's Perimeter should be conducted at the outset of the project to guard against encroachment problems.
- 4) Project Management and Supervision should be carried out by people experienced with field work in the construction and placer industries. Drilling and sample logging should be under the direct supervision of an engineer or geologist who is experienced with placer projects and who is answerable to the project manager and consultant.
- 5) Camp Facilities and Food Services must be of a quality and type that will attract and keep competent people on the project. Consideration should be given to contracting the camp operation and food services out to professional caterers.
- 6) Timing of Field Work should follow a logical sequence allowing no equipment or personnel to be idle, while taking full advantage of the weather.

PROPOSED EXPLORATION PROGRAM

The necessary and integrated components of exploration of the Redford Project to determine its gold potential during 1987, along with an estimate of their respective costs, are outlined as follows:

ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
1.	Project Organization, Planning, & Scheduling, plus procurement of a camp complex and related facilities, equipment, materials, and selection of all personnel along with arranging contracts, and application for Government permits	175,000 C\$	1.34
2.	Heavy Equipment - four machines for excavating a camp site, drill sites, and bridge approaches plus stripping and trenching of approximately 1,314,000 cubic yards of <u>frozen</u> peat and gravels; rentals are as follows: 1 only bulldozer (250 HP class) c/w blade and ripper at \$80/hr for 2200 hrs = \$176,000 1 only bulldozer (350 HP class) c/w blade and ripper at \$130/hr for 2200 hrs = \$286,000 1 only bulldozer (700 HP class) c/w blade and ripper at \$275/hr for 1100 hrs = \$302,500 1 only hoe excavator (400 HP class) c/w heavy duty frost bucket at \$150/hr for 280 hrs = \$42,000 (cost of mobilization, demobilization, fuel, operators, and wear parts shown separately)	806,500 C\$	6.16
3.	Camp Complex - portable facilities, c/w kitchen, food storage, office, wash house, bunk houses, and recreation hall for 110 persons, single and multiple-person quarters and related facilities, et al; rented units at \$23,000/month for 5.5 months (mob., set-up, and demob. costs shown separately)	126,500 C\$	0.97

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ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
4.	Sample Processing Plants - four custom rigged portable buildings, c/w bins, chutes, distributors, pumps, piping, tanks, electrical generators and wiring, heaters, screens, gravity concentrator, baggers and conveyors (laboratory-sized machines each plant capable of processing six samples each hour); purchase and fabrication of four units at \$58,000/unit including labor and materials (mobilization cost shown separately)	232,000 C\$	1.77
5.	Assay Office Complex - two custom rigged and portable buildings c/w electric wiring and water piping plus sinks, tables, balances, heaters, hoods, scales, water distillary, chemical and water storage tanks, shaking tables, microscopes, magnets, hydraulic classifiers, roller mills, etc. - capable of assaying (amalgamation) approximately 425 samples of concentrate per day; purchase and fabrication including labor and materials	185,000 C\$	1.41
6.	Tanks and Metering Devices - containers of miscellaneous sizes to store and dispense gasoline, diesel fuel, lube oil, propane, and water with an aggregate capacity of 70,000 gallons of diesel fuel and 10,000 gallons of gasoline; rental at approximately \$0.15/contained gallon per month for 5 months	60,000 C\$	0.46

7. Fuel (all types), Lube Oil, and Propane

A) Diesel Fuel and Lube Oil Average

<u>Item or Unit</u>	<u>Fuel + Lube</u>
250 HP Dozer	9 + 0.10 gal/hr
350 HP Dozer	14 + 0.30 gal/hr
700 HP Dozer	30 + 0.50 gal/hr
400 HP Hoe	12 + 0.25 gal/hr
Camp & Lab	5 + 0.05 gal/hr
(electricity)	
Drills & Drill	50 + 0.60 gal/hr
Support Units	_____
SubTotal	120 + 1.80 gal/hr

and while operating an average of 22 net hours each day:

- Diesel = (22 hrs/day) (120 gal/hr) = 2640 gal/day

- Lube Oil = (22 hrs/day) (1.8 gal/hr) = 39.60 gal/day

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ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
B) <u>Gasoline and Lube Oil</u>			
	Sample Processors	8 + 0.05 gal/hr	
	Light Trucks, A.T.V.'s, Tools (welder, etc.) and misc. equipment	3 + 0.02 gal/hr	
	SubTotal	11 + 0.07 gal/hr	
	and while operating an average of 22 net hours each day:		
	- Gasoline = (22 hrs/day) (11 gal/hr) = 242 gal/day		
	- Lube Oil = (22 hrs/day) (0.07 gal/hr) = 1.54 gal/day		
C) <u>Propane</u>			
	Camp Complex	2 pounds/hr	
	Sample Processors	8 pounds/hr	
	SubTotal	10 pounds/hr	
	and while operating an average of 22 net hours each day:		
	- Propane = (22 hours/day) (10 pounds/hour) = 220 pounds/day		
D) <u>Lube Oil, et al</u>			
	All Project Equipment - 1.87 gal/hr		
	or: (22 hrs/day) (1.87 gal/hr) = 41.14 gal/day		
<u>THEREFORE:</u>			
<u>Cumulative Consumption and Cost, while</u> considering that some machines/units are on the project longer than others, is as follows:			
- <u>DIESEL FUEL</u> (A):			
((120 gal/hr) (572 hr/mth) (4 mths/project)) -			
(((30 gal/hr) (242 hr):700 HP dozer)) +			
((12 gal/hr) (360):hoe)))			
OR:			
274,560 - 11,580 gal = 262,980 gal/project			
@ \$2.75/delivered gallon = <u>723,195 C\$</u>			
- <u>GASOLINE</u> (B):			
(11 gal/hr) (572 hrs/mth) (4.25 mths/season)			
= 26,741 gallons/project			
@ \$2.75 per delivered gallon = <u>73,538 C\$</u>			
- <u>PROPANE</u> (C):			
(10 lb/hr) (572 hrs/mth) (4.25 mths/season)			
= 24,310 pounds/project			
@ \$0.65 per delivered pound = <u>15,802 C\$</u>			

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ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
	- LUBE OIL (D): (1.87 gal/hr) (572 hrs/mth) (4.0 mths/season) = 4,279 gallons/project @ average of \$10.00 per delivered gallon = <u>42,790 C\$</u>		
	SUBTOTAL	855,325	6.53
8.	Engineering, Surveying, Office Equipment and Supplies, et al, including level, transit, chains, rods, plotters, drafting tools, typewriters, adding machines, furniture, et al; rentals at 4500C\$/month for 7 months	31,500	0.24
9.	Office and Laboratory Supplies, including acid, glassware, paper and mercury to facilitate approximately 35,000 amalgamation assays for gold; purchase	41,000	0.31
10.	Electrical Power Generating Sets for camp and assay office complex, including two 200 kW units c/w electrical cable and leads and mounted in a common van; rental @ 8000 C\$/month for 5.5 months (mobilization and set-up shown separately)	44,000	0.34
11.	Welder, Flood Lights, Misc. Tools, Small Pumps and Pipe for service of camp complex and project facilities; rentals @ 3500 C\$/month for 5 months	17,500	0.13
12.	Consumables, Services and Supplies, for camp and overall project - including cutlery, dishes, pots, pans, fuel filters, hydraulic hoses, welding rod, cutting edges, ripper teeth, track bolts, etc., and periodic grading of access roads; periodic purchases averaging 7000 C\$/month for 5 months	35,000	0.27
13.	Bridge - portable Bailey type structure for crossing Indian River c/w abutments and 100 foot long span; rental @ 12,000 C\$/month for 6 months	72,000	0.55
14.	Food and Sundries, et al, for 105 persons for 120 residence days; purchase @ 23C\$/person day, or approximately 72,450 C\$ per crew month	289,800	2.21

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ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
15.	Freight and Travel - periodic air and ground transport of consumables, personnel, and supplies, et al, for the field project; purchase @ 4000 C\$/month for 4 months (a cost in addition to charges for mobilization and demobilization)	16,000 C\$	0.12
16.	Personnel, Wages, and Salaries, et al for eighty-six persons, the majority of which work one of two 12-hour shifts during 26 days each month for four months and receive overtime pay after forty hours each week:		
No. of Persons	Job Description	Gross Pay Per Month Per Person	Gross Pay Per Season
1 only	Project Manager	10,000 C\$	70,000 C\$
1 only	Camp Manager	6,700 C\$	33,500 C\$
1 only	Administrative Assistant	6,000 C\$	30,000 C\$
1 only	Accountant	6,000 C\$	30,000 C\$
1 only	Secretary	4,500 C\$	22,500 C\$
1 only	Kitchen Manager	6,500 C\$	32,500 C\$
1 only	Warehouse Manager	6,000 C\$	30,000 C\$
1 only	Site Superintendent	7,300 C\$	36,500 C\$
1 only	Chief Geologist	6,500 C\$	32,500 C\$
1 only	Assayer/Lab Manager	6,500 C\$	32,500 C\$
8 only	Geology Tech./Drill Supers.	6,200 C\$	198,400 C\$
1 only	First Aid/Safety Person	5,500 C\$	22,000 C\$
1 only	Camp Maint./Carpenter	5,000 C\$	20,000 C\$
1 only	Expediter/Nipper	6,000 C\$	24,000 C\$
1 only	Surveyor	5,800 C\$	23,200 C\$
1 only	Chain/Rod Person	3,800 C\$	15,200 C\$
2 only	Draftspersons	4,000 C\$	32,000 C\$
1 only	Mechanic/Welder	6,100 C\$	24,400 C\$
2 only	First Cooks	6,000 C\$	48,000 C\$
8 only	Ass't. Cooks/Waiters	5,600 C\$	179,200 C\$
6 only	Bull Cooks	6,000 C\$	96,000 C\$
16 only	Sample Processors	6,000 C\$	384,000 C\$
8 only	Concentrate Baggers	4,000 C\$	128,000 C\$
8 only	Lab Technicians	4,000 C\$	128,000 C\$
4 only	Laborers/Fill-ins	4,600 C\$	73,600 C\$
8 only	Heavy Equipment Operators	6,300 C\$	201,600 C\$
10 only	Drillers	N/A	N/A
8 only	Drillers' Helpers	N/A	N/A
104 Persons to Feed and House		N/A	1,947,600 C\$
ADD Payroll Burden and Incentives @ 10%			194,760 C\$
84 Persons Paid Directly Totaling		2,142,360 C\$	16.35

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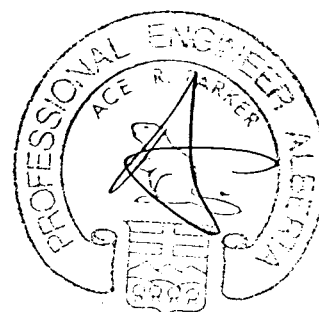
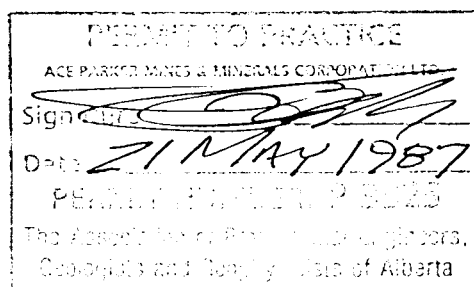
ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
17.	Communications, First Aid, and Fire Prevention Equipment for camp complex, assay office, sample processors and vehicles, et al; rentals @ 9000 C\$/month for 5 months	45,000 C\$	0.34
18.	Light Trucks, Vans, and All Terrain Vehicles and Trailers, et al including: - 3 only 3/4 ton 4x4 trucks c/2 canopies - 1 only 3/4 ton cargo van, and - 5 only 1/2 ton A.T.V.'s; rental @ average of 16,000 C\$/month for 5 months	80,000 C\$	0.61
19.	Percussion and Rotary Drilling A. Becker Type Top Hammer Percussion Drilling on Contract - two machines working at an individual average cost of 18 C\$/foot for a total of 65,000 feet = 1,170,000 C\$ (for holes less than seventy feet deep along Ruby Creek and on Ruby Ellis Bench) B. Stenuick Type Down the Hole Hammer Percussion Drilling on Contract - two machines working at an individual average cost of 22 C\$/foot for a total of 70,000 feet = 1,540,000 C\$ (for holes in excess of seventy feet deep principally on Ruby Ellis Bench) OR, alternatively to B. above, C. Reverse Circulation Type Rotary Drilling on Contract - two machines working at an average cost of 20 C\$/foot for a total of 70,000 feet = N/A SUBTOTAL (cost of mobilization, demobilization, fuel, and lost or excessively worn rigging estimated separately herein)	2,710,000 C\$	20.69
20.	Bulk Sample Processing and Sizing Tests of Auriferous Gravels from the mining sections of bulk sample pits at a minimum of two locations employing screens and gravity concentrators employed in conjunction with pumps and pipe, plus heavy earth moving equipment - cost includes stacking of tailings, concentrate treatment, mobilization, and demobilization - all on contract for 412,500 cubic yards @ 7.75 C\$/yd ³ processed, plus the cost of fuel and heavy equipment operators	3,196,875 C\$	24.40

... continued

ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
21.	Mobilization and Demobilization, et al; to and from the project site from Whitehorse, Edmonton, Prince George, and Vancouver:		
	A. Bridge - 100 foot span Bailey Type c/w abutments: (2) (\$5.50/LdMi) (1675 Mi) (6 Lds) = 110,550 C\$		
	B. Heavy Equipment:		
	- "250 HP dozer" c/w blade and ripper; (2) (\$5.50/LdMi) (385 Mi) (1 Ld) = 4,235 C\$		
	- "350 HP dozer" c/w blade and ripper; (2) (\$5.50/LdMi) (385 Mi) (1 Ld) = 4,235 C\$		
	- "700 HP dozer" c/w blade and ripper; (2) \$5.50/LdMi) (2450 Mi) (2 Lds) = 53,900 C\$		
	- "400 HP hoe" c/w frost bucket; (2) (\$5.50/LdMi) (1675 MI) (2 Lds) = 36,850 C\$		
	C. Camp Complex for 110 persons from British Columbia or Alberta including portable kitchen, washhouse, bunkhouses, warehouse and office buildings, plus power generating van and assay office structures: (2) (\$3.50/LdMi) (1675 Mi) (30 Lds) + (Camp set-up cost at \$74,000) = 425,750 C\$		
	D. Tanks, Tools, Pipe, and Small Pumps: (2) (\$5.50/LdMi) (1675 Mi) (4 Lds) = 73,700 C\$		
	E. Light Equipment, et al: (2) (\$5.50/LdMi) (385 Mi) (2 Lds) = 8,470 C\$		
	F. Sample Processors: (2) (\$5.50/LdMi) (1675 Mi) (4 Lds) = 73,700 C\$		
	G. Project Personnel, et al: (2) (80 persons) (\$460/trip) = 73,600 C\$		
	H. Drills and Drill Support Units: - two Becker type machines, one truck mounted and one track mounted machine; (2) (\$5.50/LdMi) (2450 Mi) (5 Lds) = 134,750 C\$		

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ITEM NO.	DESCRIPTION AND PURPOSE	ESTIMATED COST	PERCENT COST
	- two Stenuick or rotary type machines, one truck mounted and one track mounted machine; (2) (\$5.50/LdMi) (385 Mi) (2 Lds) = 8,470 C\$ (2) (\$5.50/LdMi) (2450 Mi) (3 Lds) = 80,850 C\$		
	SUBTOTAL	1,089,060 C\$	8.31
22.	Administration, Management, and Head Office Overhead directly related to exploration of the Redford Project, including:		
	A. Town Office Rental (furnished) @ 1000 C\$/mth for 7 mths = 7000 C\$		
	B. Office Supplies and Services @ 200 C\$/mth for 7 mths = 1400 C\$		
	C. Accounting and Audit @ 1200 C\$/mth for 7 mths = 8400 C\$		
	D. Insurance - environmental and "umbrella" type for Redford Project @ 16,000 C\$/mth for 5 mths = 80,000 C\$		
	E. Legal Costs, et al @ 3000 C\$/mth for 7 mths = 21,000 C\$		
	F. Printing and Reports @ 500 C\$/mth for 7 mths = 3500 C\$		
	G. Telephone, Telex, and Radio Telephone @ 800 C\$/mth for 7 mths = 5600 C\$		
	H. Travel - Air and Ground @ 1500 C\$/mth for 7 mths = 10,500 C\$		
	SUBTOTAL	137,400 C\$	1.05
23.	Consulting, Project Design, Evaluation of Exploration Results, Maps, and Technical Reports to Government and Industry	375,000 C\$	2.86
24.	Contingencies and Escalation	337,180 C\$	2.57
TOTAL EXPLORATION EXPENDITURES - 1987		13,100,000 C\$	99.99



CONCLUSIONS AND RECOMMENDATIONS

The Redford Project covers in excess of four thousand (4000) acres of mineral land in the Klondike Region of the Yukon Territory. This land has been acquired from the Federal Government of Canada under the provisions of the Yukon Placer Mining Act for the primary purpose of exploring deposits of surficial material for gold.

Deposits of Tertiary stream gravel underlie eighty-five (85) percent of the property, and are known on the basis of limited exploration to be auriferous at several locations. Except for shallow trenches and pits recently cut in the surface of these deposits with a bulldozer, and similar excavations dug with hand tools by "old timers" prior to 1930, the surficial deposits remain essentially unexplored by any effective means at this time.

Placer gold values of an economically viable tenor (0.0555) were recently discovered at surface in a burned area adjacent to Ruby Creek, and there are indications that reserves of equal tenor probably exist at other locations along this stream.

Also, there is a good possibility that the bottom one-third section of the thick gravels that make up Ruby Ellis Bench contain gold values of a tenor similar to those surficial deposits situated along Ruby Creek - particularly in that portion of the bench located southeast of the confluence of Ruby Creek and the Indian River where the current access trail passes along the property.

Ruby Ellis Bench is a large gravel terrace that runs along the subject property for a distance of four miles and contains the largest quantity of potentially auriferous gravel.

Placer gold exists in the surface gravels of Ruby Ellis Bench and geologic evidence revealed during 1986 in the production pit of a profitable mining operation situated in the Indian River Valley adjacent to the northern edge of Ruby Ellis Bench indicates that the auriferous gravels which are currently being mined there probably extend into and under this large terrace (refer to Dwg. #87-8-4 this report, Geologic Cross Section).

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Unfortunately, no tenor can be assigned to these terrace gravels at this time due to the lack of quantitative data. For the same reasons none of the geologically indicated auriferous reserves, including those most known and relatively shallow deposits situated along Ruby Creek, can be classified as Proven ore reserves in a strict engineering sense.

Most of the potentially auriferous gravel deposits on the property are permanently frozen and vary in depth from twenty (20) to two hundred and fifty (250) feet deep. Therefore the most practical way to explore and evaluate these surficial deposits is by large diameter drilling in conjunction with continuous sampling of the drill cuttings. Individual samples can be concentrated at the drill set-ups and assayed on site resulting in a significant cost saving along with immediate availability of results.

A program of bulk sampling with large earth moving equipment will be necessary to confirm the gold values indicated by the drilling program, thus providing a correlation between the drill-indicated auriferous reserves and the actual tenor of the reserves in situ. This work will also indicate the percentage of gold that can be recovered from a full-scale mining operation.

A compilation of the combined results of drilling and bulk sampling will provide the basis for a sound evaluation of the property and the subsequent classification of the auriferous reserves into Proven, Probable, and Possible types of ore reserves necessary as the foundation of a bankable feasibility study and detailed design of a new gold mine.

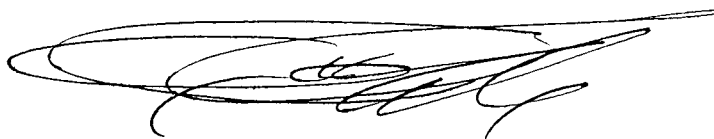
In view of the present geologic understanding of the property, along with the favorable economic environment pertaining to the placer gold mining industry in general - especially the price of gold and anticipated low mining costs, it is our considered opinion that thorough exploration of the subject property is justified at this time to assess its placer gold potential.

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Consequently it is our firm recommendation that the property should be subjected to the exploration program that is set out in this report. The proposed exploration work is estimated to cost a total of 13,100,000 C\$ if conducted during the summer and fall months of 1987.

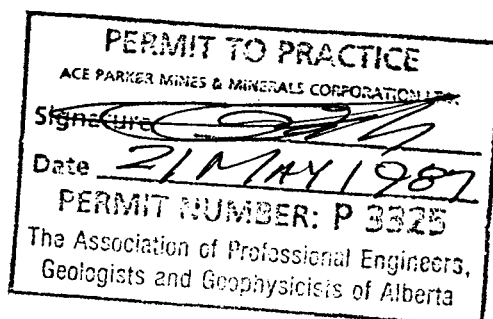
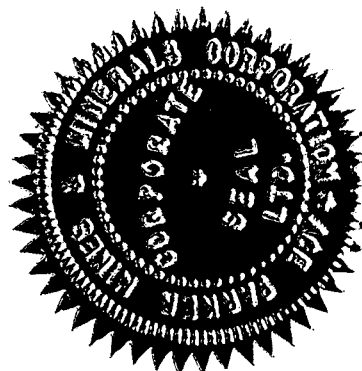
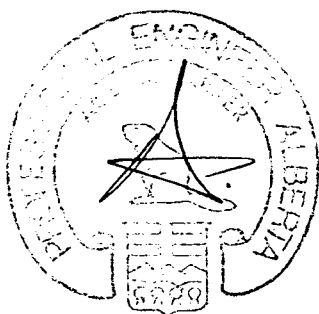
Respectfully Submitted,

ACE PARKER MINES & MINERALS CORPORATION LTD.



Ace R. Parker, P.Eng.

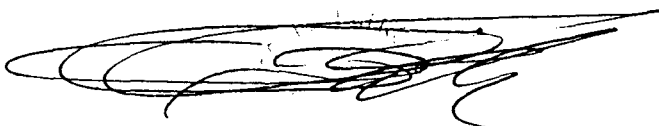
Dated at Calgary, Alberta
this 21st day of May, 1987



CERTIFICATION

I, Ace R. Parker of Calgary, Alberta, Canada, certify and declare that:

- o I am a Consulting Engineer, practicing with the firm of Ace Parker Mines & Minerals Corporation Ltd., with its Head Office at Suite 203, 513 - 8th Avenue S.W., Calgary, Alberta, Canada, T2P 1G3.
- o I am President of the above named Company which is a duly incorporated body and is licenced to practice Professional Engineering (APEGGA Permit No. 3325).
- o I have been granted a Bachelor of Science Degree in Mining Engineering from the College of Earth Science and Mineral Industry, University of Alaska, Fairbanks, Alaska (1962). I hold a diploma in Mineralogy from the Mineral Science Institute, Chicago, Illinois, U.S.A. (1959).
- o I am a member in good standing of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta. I have been a member of the American Institute of Mining, Metallurgical and Petroleum Engineers since 1954.
- o I have formally practiced the Profession of Mineral Exploration/Development/ Mining as a Professional Engineer for the past 23 years after working in the Mineral Industry since 1953. I have found and guided development of several economic mineral deposits, including placer gold deposits, in North America.
- o This Certification is part of the attached "Engineer's Report on the Placer Gold Potential and Proposed Exploration of the Redford Project", prepared for Alcar Construction Ltd., and dated May 21, 1987.
- o I have no interest in the subject project/property discussed in the attached "Engineer's Report".
- o The subject claims/property covered by said report, according to field evidence and public records, have a valid title and have been legally granted and/or transferred to the current owner(s) in compliance with the laws and statutes of the Government of Canada.
- o The attached Engineer's Report is based on a comprehensive personal study of documents, field evidence, maps, and reports, both oral and printed, but directly related to the subject project/property discussed herein. I have on several occasions examined the subject property and have designed the exploration program that is proposed in said report. My evaluation of the property and the viability of the proposed exploration program is based on my experience in the mineral industry and modern technology. I have operated placer gold mines in Alaska and Canada when the economic-technologic conditions were less favorable than they are today.



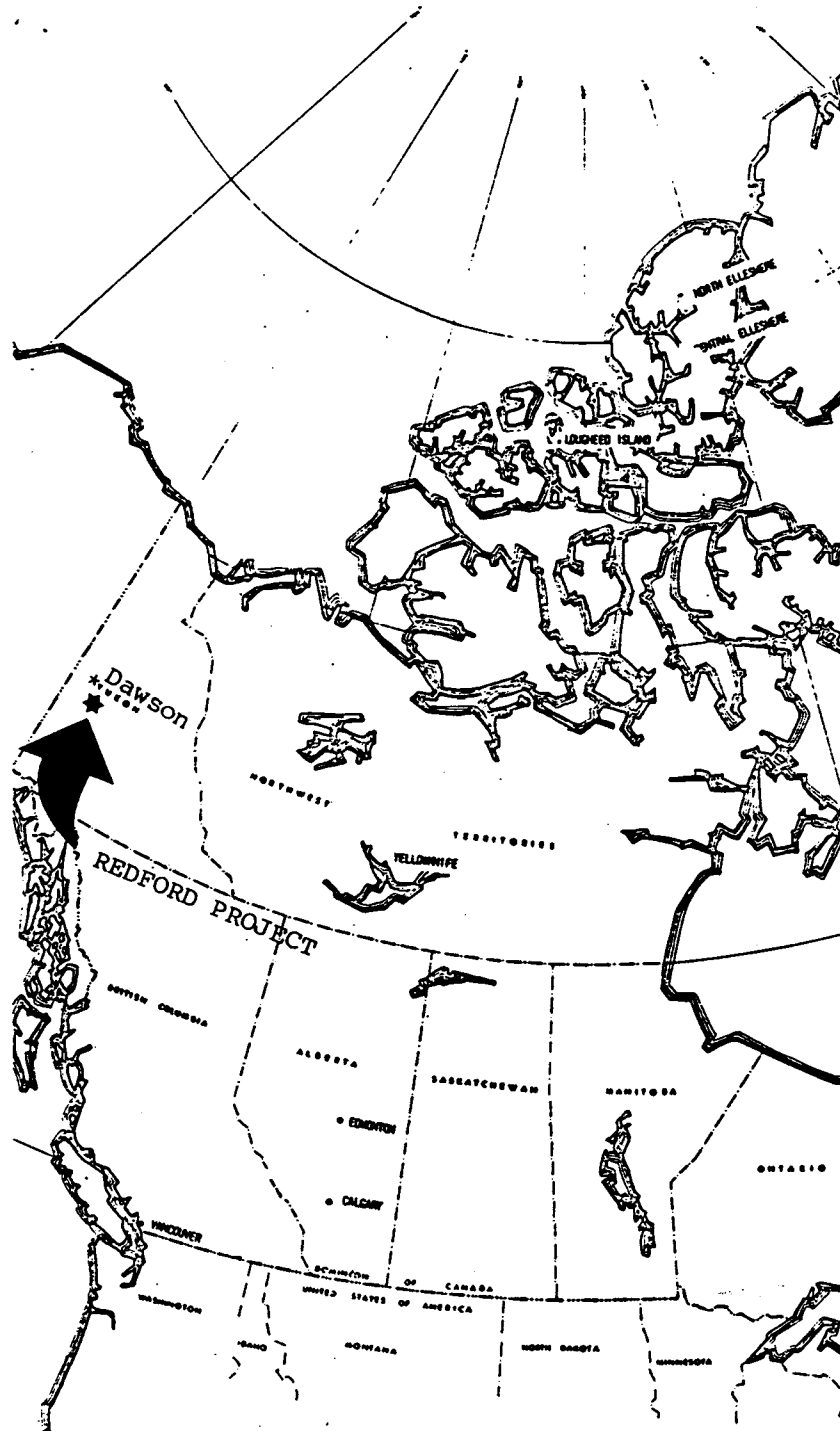
Ace R. Parker, P.Eng.

Dated at Calgary, Alberta
this 21st day of May, 1987

REFERENCES

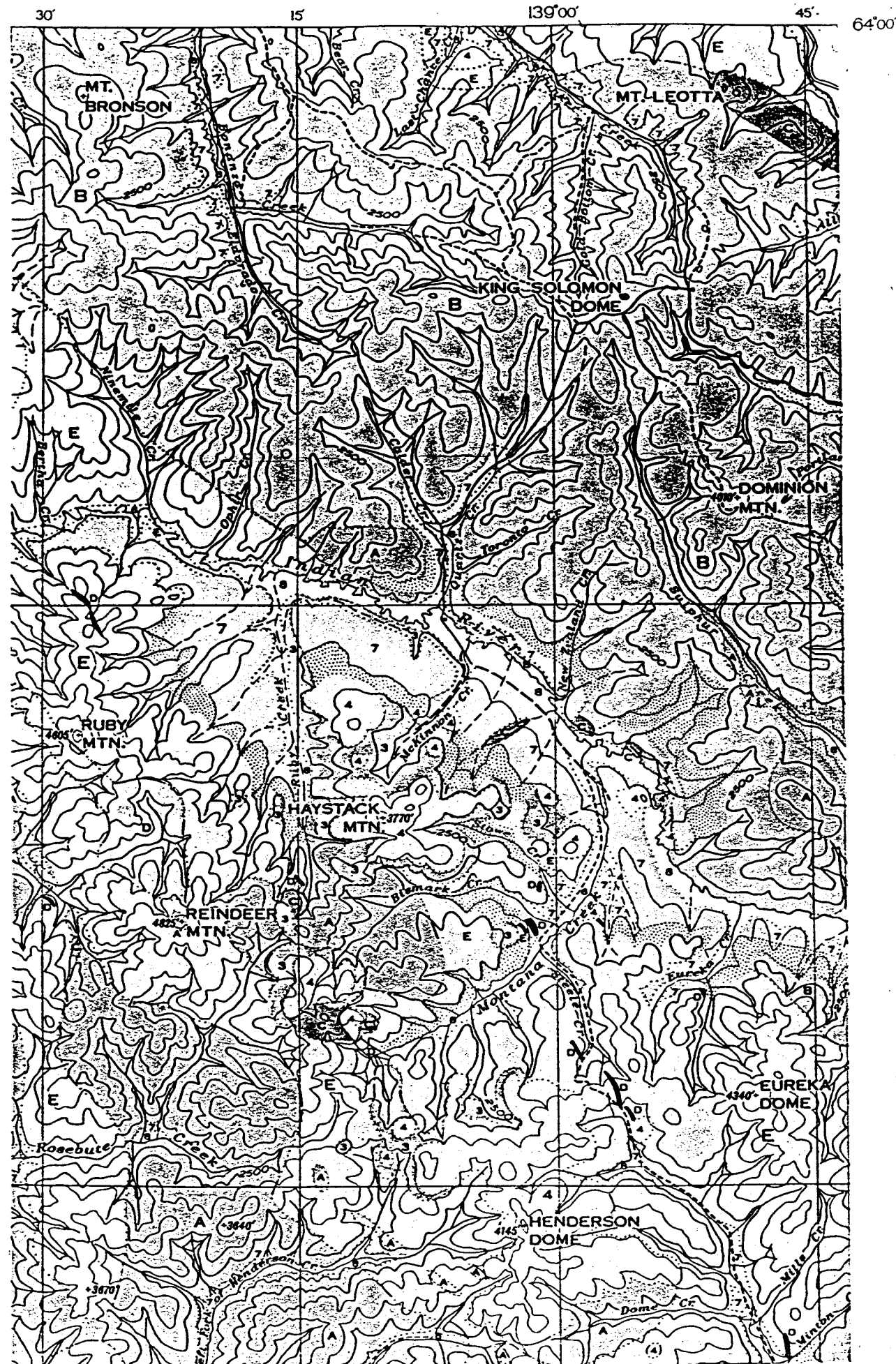
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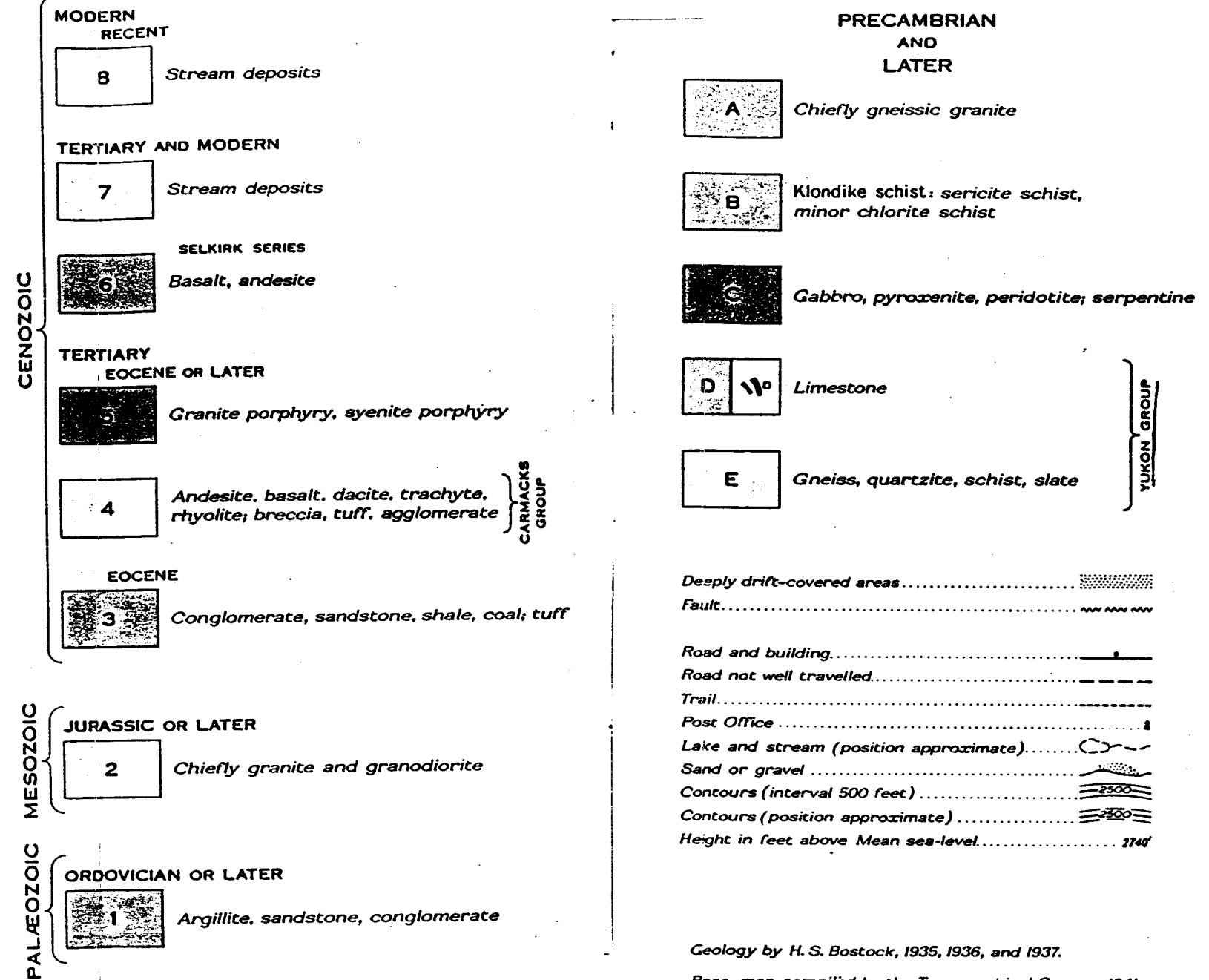


PROJECT LOCATION MAP

DWG. #87-8-1



LEGEND

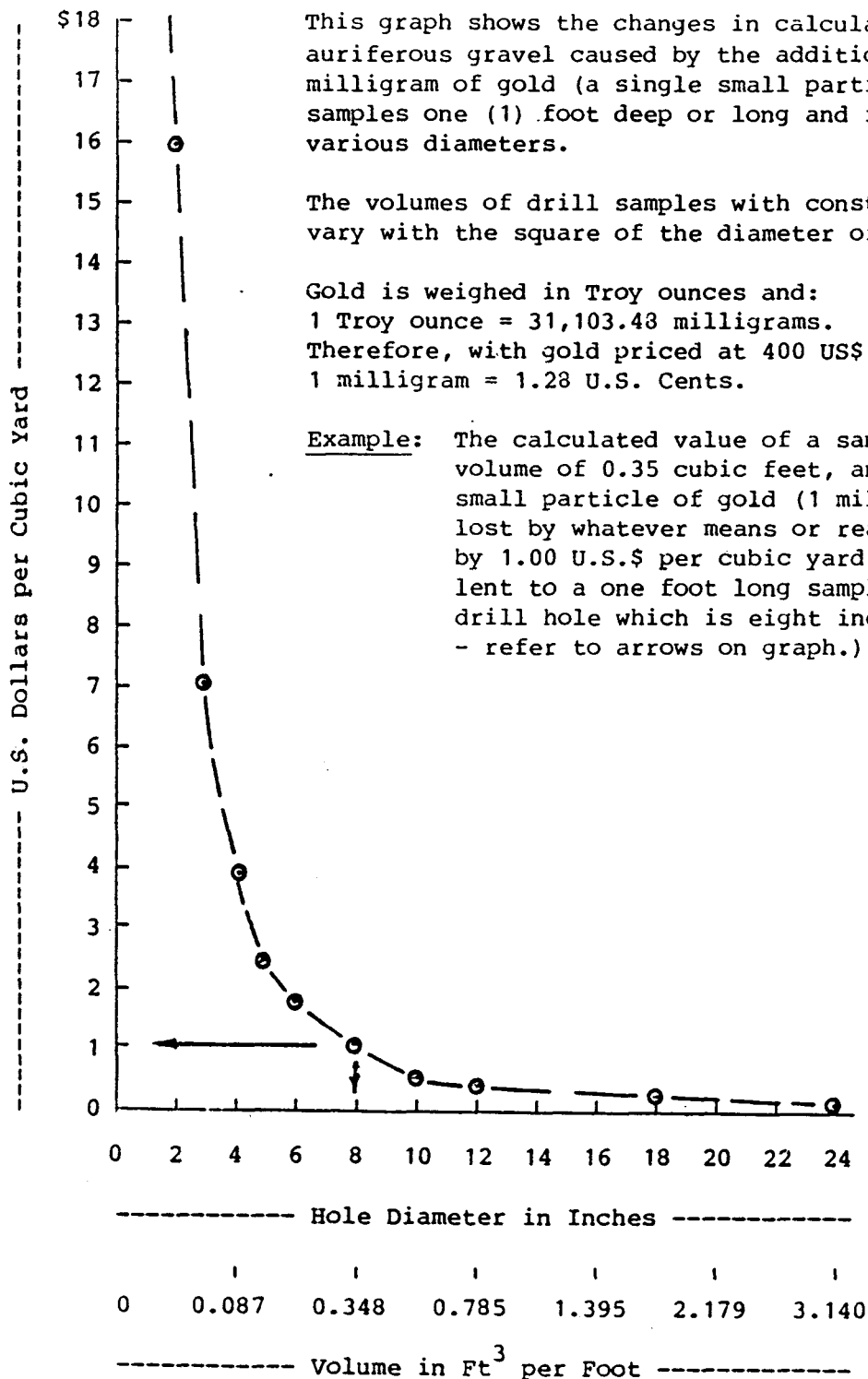


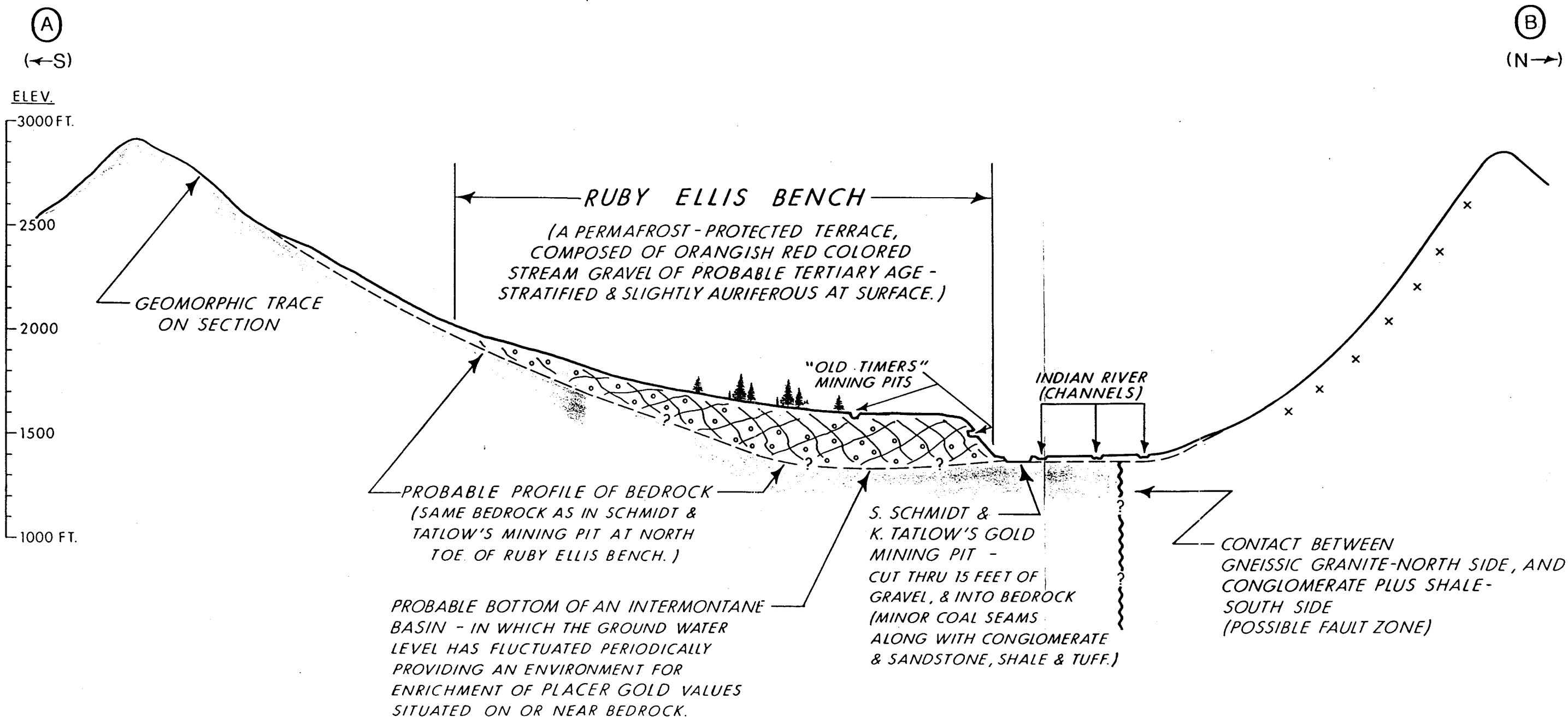
MAP 711A OGILVIE YUKON TERRITORY

Scale, 253,440 or 1 Inch to 4 Miles

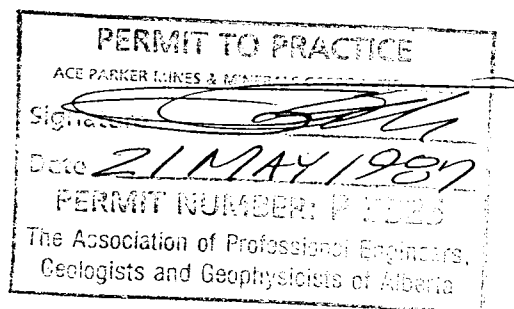
Approximate magnetic declination, 34° East.

SENSITIVITY GRAPH - DRILLING

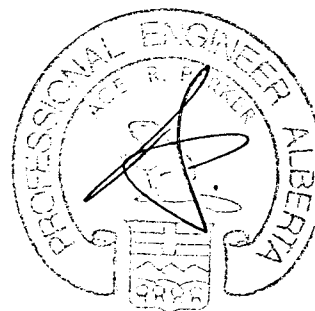




SECTION "A - B"
ACROSS THE INDIAN RIVER VALLEY LOOKING WEST
(REFER TO DWG. 87-8-5)



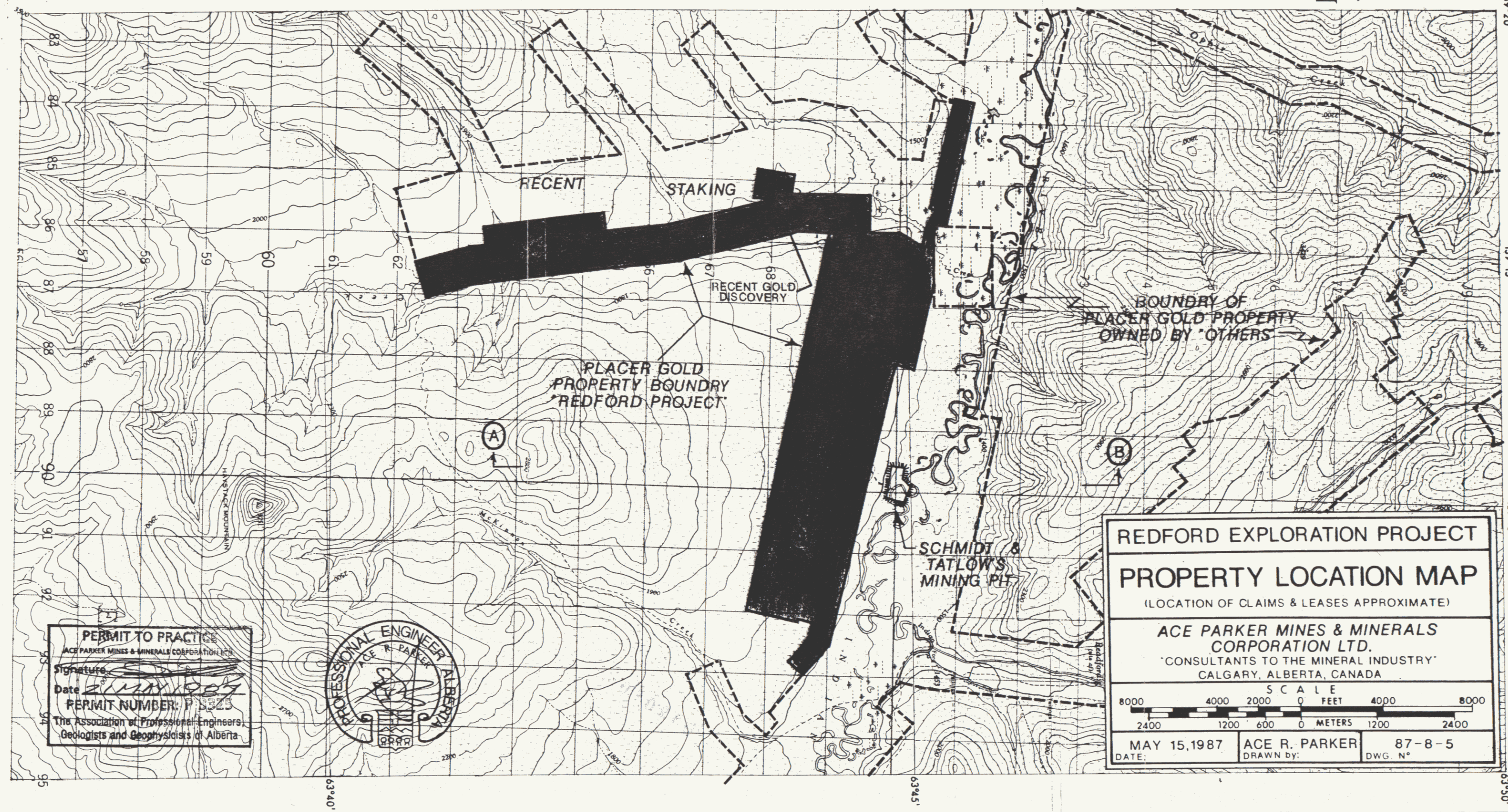
HORIZONTAL SCALE : 1IN. = 2000 FT.
VERTICAL SCALE : 1IN. = 500 FT.



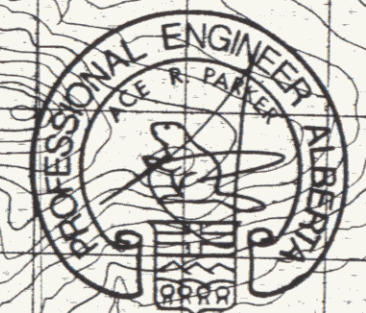
REDFORD EXPLORATION PROJECT		
GEOLOGIC CROSS SECTION		
ACE PARKER MINES & MINERALS CORPORATION LTD. "CONSULTANTS TO THE MINERAL INDUSTRY" CALGARY, ALBERTA, CANADA		
MAY 15, 1987 DATE:	ACE R. PARKER DRAWN by:	87-8-4 DWG. N°.

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PERMIT TO PRACTICE
ACE PARKER MINES & MINERALS CORPORATION LTD.
Signature: *[Signature]*
Date: 21 MAY 1987
PERMIT NUMBER: P 3323
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta



REDFORD EXPLORATION PROJECT		
PROPERTY LOCATION MAP		
(LOCATION OF CLAIMS & LEASES APPROXIMATE)		
ACE PARKER MINES & MINERALS CORPORATION LTD.		
"CONSULTANTS TO THE MINERAL INDUSTRY"		
CALGARY, ALBERTA, CANADA		
SCALE		
8000	4000	2000
0 FEET		
4000	2000	8000
2400	1200	600
0 METERS		
1200	2400	
MAY 15, 1987	ACE R. PARKER	87-8-5
DATE:	DRAWN BY:	DWG. N°