ARCHER, CATHRO
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GEOLOGICAL AND GEOCHEMICAL REPORT

on the

NUCLEUS PROPERTY

(Nucleus 50-141 and ERL 1-40, 43-66, 69-90
95-178, 181-206 and 209-274)

located at

Latitude 62°15'N; Longitude 137°30'W

NTS 115I/5 & 6

W. DOUGLAS EATON, B.A., B.Sc.

Work performed between August 5 and 15, 1985

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ 20,250.

Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

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INTRODUCTION

Nat Joint Venture (Nat) staked the first 34 Nucleus claims in August, 1980 and added a further 107 from 1981 to 1984. Work done during this period included geological mapping, grid soil geochemistry, linecutting, magnetometer and test EM-16 surveys, 2181 m of bulldozer trenching to bedrock and 315 m of diamond drilling in three holes. The geochemical exploration outlined four gold anomalies, two of which (Anomalies 1 and 2) are associated with a north-northwest trending, steeply dipping swarm of intensely clay altered and often brecciated feldspar porphyry dykes cutting less altered metamorphic and granitic country rocks. Initial development of these zones indicates potential for four to five million tons of oxidized rock averaging 0.03 oz/ton Au to a depth of 60 m. Both zones are open along strike, but the larger (Anomaly 2) trends onto the adjacent Revenue property (Nordac Mining Corporation and Yukon Revenue Mining Limited) to the south.

The 1985 Freegold Venture (FV) program was designed to protect and evaluate geochemical and geological targets peripheral to the main Nucleus claims. Aside from 7.5 hours of Cat 235 excavator time used to dig drainage ditches along the access road, no work was done on the main showing. During June, 256 ERL claims were staked immediately southwest of the Nucleus claims, and in August, 6 ERL claims and 8 MEC claims were added to the south. Exploration consisted of geological mapping, prospecting and wide spaced soil geochemistry, plus three small detail soil grids which tested isolated, high gold values obtained from earlier Nat sampling. The work was done from two flycamps on the property and was supervised by the author. Appendix I contains the author's Statement of Qualifications, while Appendix II lists personnel who worked on the claims.

PROPERTY, LOCATION AND ACCESS

The Nucleus property now consists of 411 claims, including 141 Nucleus, 262 ERL and 8 MEC claims, as shown on Figure B1. The claims are registered in the name of Archer, Cathro & Associates (1981) Limited with the Whitehorse Mining Recorder as listed below.

Claim Name	Grant Number	Expiry Date
Nucleus 1-12	YA51189-YA51200	February 19, 1993
Nucleus 13-18	YA51201-YA51206	February 19, 1994
Nucleus 19-34	YA51207-YA51222	February 19, 1993
Nucleus 35-50	YA60256-YA60271	March 1, 1993
Nucleus 51-90	YA82735-YA82774	February 19, 1990
Nucleus 91-141	YA82910-YA82960	February 19, 1990
ERL 1-40	YA92344-YA92383	July 2, 1986
ERL 43-66	YA92384-YA92407	July 2, 1986
ERL 69-90	YA92408-YA92429	July 2, 1986
ERL 95-178	YA92430-YA92513	July 2, 1986
ERL 181-206	YA92514-YA92539	July 2, 1986
ERL 209-268	YA92540-YA92599	July 2, 1986
ERL 269-274	YA93132-YA93137	August 20, 1986
MEC 1-8	YA93679-YA93686	September 24, 1986

Approximately half of the ERL and all of the MEC claims fall within the Nat area of influence surrounding its Nucleus claims.

The claims are located at latitude 62°15'N and longitude 137°30'W, on NTS map sheets 115I/5 & 6, 63 km northwest of Carmacks. The eastern portion of the property is accessible from the Freegold Road using two routes maintained by placer miners. One follows the ridge separating Big Creek from Bow Creek, while the other parallels the south bank of Big Creek. Both are usable in dry weather throughout the summer and fall. Access during 1985 was by helicopter operating from a base in Carmacks.

FIGURE B1

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

CLAIM MAP

NUCLEUS EXTENSION

FREEGOLD VENTURE

PREVIOUS WORK

The eastern fifth of the Nucleus claims were originally staked as part of the Yukon Revenue property, which was explored by several groups as a low grade copper-molybdenum target in the late 1960's and early 1970's and as a high grade gold target in the 1950's and 1980's. Most gold exploration on the Yukon Revenue property was directed toward discontinuous lenses of chalcopyrite and pyrite occurring in argillically altered breccia zones, 2 km east of the Nucleus gold zones. The best assays reported from the Yukon Revenue zones were 0.40 oz/ton Au with 2.0 oz/ton Ag and 0.28% WO3 across 3.3 m in a trench, and 0.14 oz/ton Au with 0.7 oz/ton Ag, 1.02% Cu and 0.18% WO3 across 7.0 m from a diamond drill hole.

The Nucleus 35 to 141 claims occupy ground previously staked as the Cash claims (private individuals from Whitehorse 1979-1980), Com claims (Cominco 1969) and the Roy, Tye and Skunk claims (Klotassin JV 1974-1975). Cominco and Klotassin JV conducted geochemical soil surveys over the area but outlined only a few, weak to moderate, copper, molybdenum, lead and zinc anomalies. Grid samples taken by Klotassin JV were analyzed for gold by Nat in the fall of 1984 and returned low values, except for two spot highs of 149 and 129 ppb.

The ground now covered by the MEC claims was previously staked as the Ken claims by G. Harris in May, 1984. It was acquired by FV when no assessment work was filed and the claims lapsed.

Most creeks draining the property have received some placer exploration but there is no record of production except for Mechanic Creek which drains the main Nucleus zones.

PHYSIOGRAPHY AND GEOMORPHOLOGY

The Nucleus property covers a long, gentle slope on the north side of a broad ridge separating the Big Creek and Bow Creek drainages. Several streams flow north across the property and have cut deep, strikingly linear, V-shaped valleys perpendicular to Big Creek. Local elevations range from 700 m on the floor of Big Creek Valley to 1525 m on the crest of the west-northwest trending ridge immediately south of the property. Above 1250 m vegetation is restricted to moss and lichens and at lower elevations it ranges from spruce and poplar trees on south- and east-facing hills to stunted black spruce and thick moss on north- and west-facing slopes. Approximately 50% of the ERL claims are above treeline.

Soil profiles typically include 1 to 10 cm of A horizon organics, 0 to 100 cm of volcanic ash, 5 to 50 cm of B horizon soil and 100 to 300 cm of C horizon soil over deeply weathered bedrock. Glacial and fluvial deposits are rare except on the floor of the Big Creek Valley which is blanketed by a layer of glaciofluvial outwash up to 60 m thick. Permafrost is extensive, particularly on north- and west-facing slopes. Outcrop and talus is restricted to ridge crests and steep southeast-facing slopes.

GEOLOGY AND MINERALIZATION

Figure B2 in the pocket illustrates the geology of the Nucleus property with emphasis on the new claim blocks (for details of geology and mineralization of the Nucleus claims, the reader is referred to the 1982 and 1984 assessment reports for the Nucleus property).

The oldest rocks on the property are Paleozoic or older Pelly Gneiss metamorphic rocks which are intruded and overlain by a complex of Jurassic and Cretaceous plutonic, subvolcanic and volcanic rocks. The main lithologies are briefly described below from oldest to youngest.

Pelly Gneiss (Psn) forms large rafts or roof pendants within the intrusions. It exhibits strong heterogeneity and includes chlorite schist, quartz-muscovite schist, amphibolite, impure quartzite and quartz-feldspar granulite. This suite is consistent with a paleolith composed of intermediate to felsic tuffs, sediments and mafic to felsic tuffs. Rare garnet porphyroblasts indicate greenschist facies metamorphism.

Big Creek Syenite (Jy) underlies most of the ERL claims and forms a prominent topographic high along the southern margin of the younger intrusive complex. The rocks are dark and resistant weathering, coarse grained to porphyritic, and occasionally strongly foliated. They contain orthoclase crystals up to 4 cm and hornblende up to 2 cm in length.

Casino Granodiorite (Kgd) is most abundant along the southern and eastern edges of the property. It is resistant weathering, medium grained, equigranular, unfoliated, and characteristically contains biotite and hornblende. The syenite-granodiorite contact is linear where it crosses the ERL claims and may be a fault as no syenite xenoliths have been observed in the granodiorite.

Quartz-feldspar porphyry (Kqfp) occurs in dykes and plugs that are scattered across the entire property but are most abundant in the northern third which underlies the Nucleus claims. The rocks are typically orange to tan and recessive weathering, and grade in composition from quartz-feldspar porphyry (Kqfp) to feldspar porphyry (Kfp) to feldspar biotite hornblende porphyry (Kfbhp). The felsic phases are commonly argillically altered and occasionally brecciated.

Andesites (Kmn) include scattered volcanic flow rocks in the northern part of the property and a resistant weathering, dark green, andesite plagioclase porphyry feeder dyke in the southeastern corner.

Two groups of faults are found on the property, one trending north-south and the other east-west. They appear to be an approximately coeval conjugate set probably related to the Big Creek Fault.

No economic mineralization was observed on the new claims. The most interesting rock was found in a small outcrop in the west-central part of the ERL claims where chalcedony- and limonite-cemented feldspar porphyry breccia cuts siliceous and argillically altered syenites. However, a specimen of this material returned only 1 ppb Au.

GEOCHEMISTRY

General

Soil samples were collected from the B horizon at 100 m intervals along the ERL claim lines to provide wide spaced coverage of the claim block; and at 100 m intervals on compass and topofil controlled lines spaced 100 m apart on three small grids. The grid sampling tested two isolated high soil gold values obtained by Nat in 1984 from the Nucleus 50-141 claims and a cluster of anomalous gold values in soil and stream from Nat reconnaissance traverses in 1980 and 1981 on what is now the ERL claims. Sample sites along the baselines were marked with flagging bearing the sample numbers, while the baselines and sample sites on the grids were marked with 0.5 m lath pickets bearing an aluminium tag inscribed with the grid coordinates and sample number. A total of 645 soil and rock samples were collected.

All samples were sent to Chemex Labs Ltd. in North Vancouver. The soils were screened to -35 mesh, crushed and geochemically analyzed for gold using a fire assay preparation and neutron activation analysis. Rocks were crushed, ring pulverized to -100 mesh and then geochemically analyzed by the same technique as the soils. Thirty element ICP analyses were also performed on 24 selected samples.

Results

Gold backgrounds in soils and rocks on the ERL claims are low, averaging about 5 ppb, as shown on Figure B3 in the pocket. Anomalous values ranging from the 25 ppb threshold to 301 ppb are scattered across the property but their significance is difficult to determine due to the wide sample spacing and general lack of bedrock exposure.

Results from only one of the three detail grids reproduced the earlier anomalous values. This grid is on the west side of No Name Creek (on the Nucleus 50-141 claims) where previous work yielded 129 ppb Au from a soil sample and 69 ppb from a nearby stream sediment sample. The FV sampling returned two strongly anomalous values (207 and 179 ppb) downhill from the Nat sample sites. These anomalous values are erratically distributed over a 550 by 350 m area and are surrounded by background to weakly anomalous values. The area is heavily vegetated and only one outcrop consisting of a dense, tan coloured rock (skarnified Pelly Gneiss?) was found.

ICP analyses done on samples that produced anomalous gold results returned background values for all metals, except for a few scattered arsenic values in the range of 100 to 430 ppm.

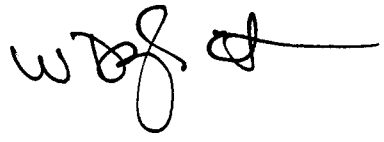
DISCUSSION AND CONCLUSIONS

Although geological mapping on the ERL and Nucleus 37-141 claims was frustrated by the lack of bedrock exposure, it showed that porphyry dykes, breccia zones and large faults are present. Thus, the environment is generally favourable for hosting gold mineralization similar to known deposits in the Dawson Range. The soil sampling was too wide spaced to properly evaluate the claims but did indicate several areas which should receive more detailed coverage.

Grid sampling on a portion of the Nucleus 50-141 claims has outlined an area containing erratic but strongly anomalous gold values which may be related to a skarnified Pelly Gneiss. The association of gold with a skarn is interesting as a high gold value (485 ppb) was obtained by Nat in 1981 from a 1.3 m wide scheelite-fluorite-quartz vein that outcrops on the bank of Big Creek, 900 m to the north. Unfortunately tungsten values from the anomalous soil samples were low.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED



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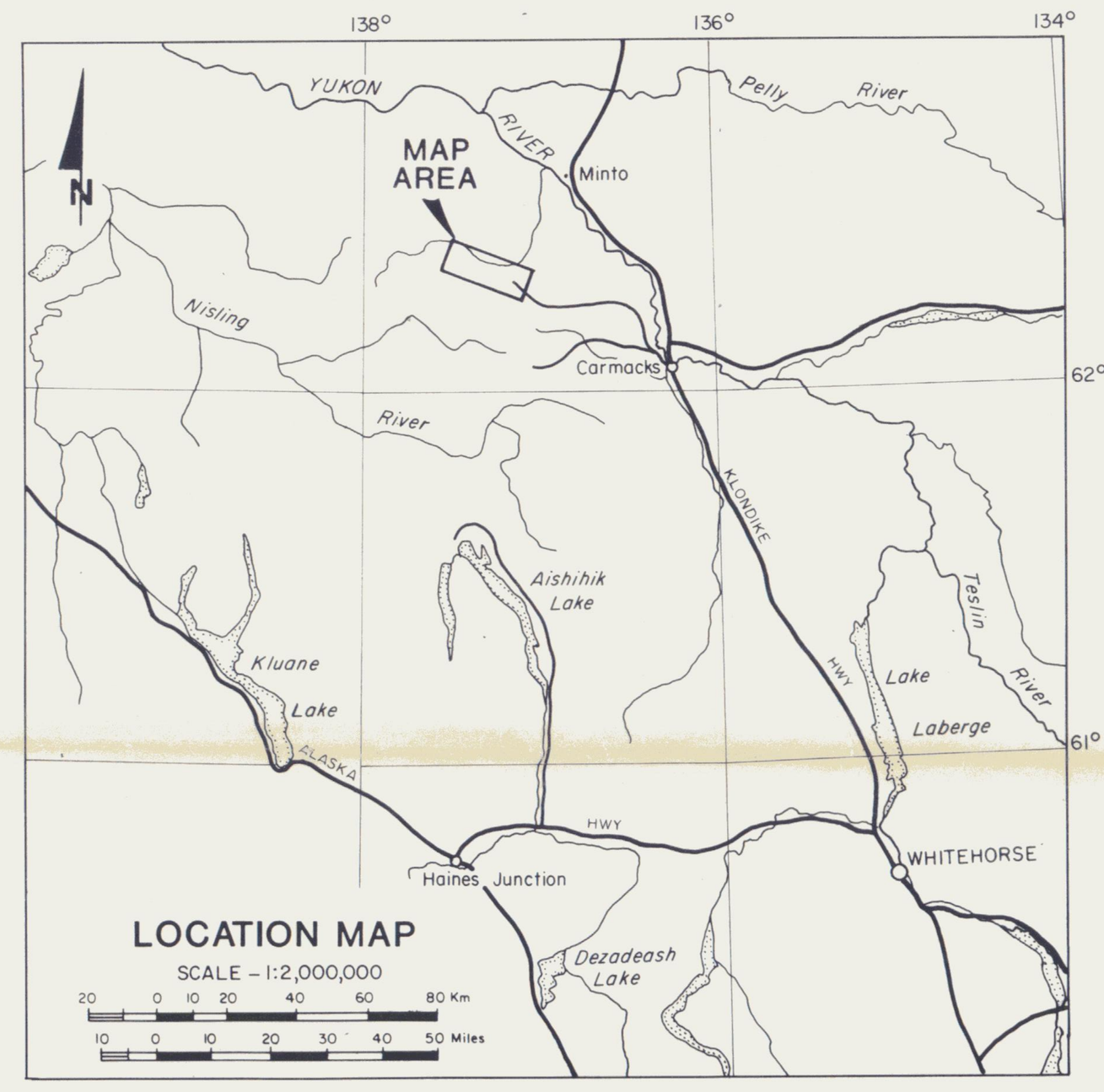
W.D. Eaton, B.A.,B.Sc.



LEGEND

RECENT

Qfl	Glaciofluvial outwash

CRETACEOUS

uKct	Interbedded quartzite, sandy tuff and conglomerate
Kmn	Andesite
Kqfp	Quartz feldspar porphyry, grades to quartz porphyry (Kqp), feldspar porphyry (Kfp) and feldspar-biotite-hornblende porphyry (Kfbhp)
Kmg	Microgranite
Kgd	Casino Granodiorite
Kg	Coffee Creek Granite

JURASSIC

Jy	Big Creek Syenite

PALEOZOIC OR OLDER

Psn	Pelly Gneiss: schist with lesser gneiss, amphibolites and quartzites
Ppn	Selwyn Gneiss: hornblende-biotite-chlorite gneiss

Approximate geological contact

Fault

Outcrop

Phyllitic and/or argillitic alteration zone

Road, trail

Air strip (W - winter use only)

Property boundary

NAT JV area of influence

⊗ Cu Mineral occurrence and metal (f - float)

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Figure B2

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

GEOLOGICAL COMPILATION

BIG CREEK AREA

FREEGOLD VENTURE

SCALE – 1:20,000

500 0 200 500 1000 1500 Metres

1/2 1/4 0 1/4 1/2 1 Miles

Revised March 1986

To accompany report dated December, 1985

Nitro Property
(NAT & FV)
Nucleus Property
(NAT & FV)
Figure N5
1984 Nat Final Report
Revenue Property
(Nordac / Yukon Revenue)
Happy Claims
Figure
1985 FV Final Report
NAT (JV)
area of influence
Big
Creek
Bow Creek
Stoddart Property
(FV)
Stoddart
Creek
Ken Claims
G. Harris
L. Lebedoff
J. Suits
Figure F2
1985 FV Final Report
Yukon Revenue
Guder Mines
Mount Freegold
Permian/
Nordac
Seymour
Teck/Royrock
LOCATION MAP
SCALE – 1:2,000,000
Dezadeash Lake
WHITEHORSE
LEGEND
Soil sample location and gold value in ppb
Stream sediment sample location and gold value in ppb
Rock sample location and gold value in ppb
Area containing values greater than 50 ppb Au, actual values shown on detail maps
NAT JV area of influence
Road, trail
Bulldozer trench
Airstrip (W - winter use only)
NAT (1984) diamond drill hole – inclined, vertical
Atlas (1970) diamond drill hole – inclined, vertical
Yukon Revenue (1968 and 1969) diamond drill hole – inclined, vertical
Shakwak (1984) diamond drill hole – inclined
Kaiser (1970) diamond drill hole – vertical with average gold assay for length of hole in oz/ton
Kaiser (1970) percussion drill hole – vertical with average gold assay for length of hole in oz/ton
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Figure B3
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
GEOCHEMICAL COMPILATION
BIG CREEK AREA
FREEGOLD VENTURE
SCALE – 1:20,000
Metres
Miles
Revised March, 1986
To accompany report dated December 1985

APPENDIX I

Author's Statement of Qualifications

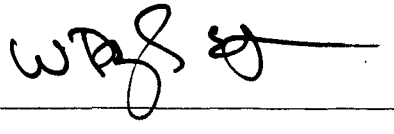
STATEMENT OF QUALIFICATIONS

I, W. Douglas Eaton, geologist, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia, and residential address in Burnaby, British Columbia, do hereby declare:

1. I graduated from the University of British Columbia in 1980 with a B.Sc.

2. From 1971 to the present, I have been actively engaged in mineral exploration in British Columbia and Yukon Territory and on June 1, 1981, became a partner in Archer, Cathro & Associates (1981) Limited.

3. I have personally participated in or supervised the field work reported herein and have interpreted all data resulting from this work.



W. Douglas Eaton, B.A., B.Sc.

APPENDIX II

List of Personnel

LIST OF PERSONNEL - NUCLEUS PROPERTY

DATES WORKED: August 5 - August 15, 1985

NAME	ADDRESS	POSITION
W. Halleran	Box 793, Fort St. James, B.C.	Geologist
M. Walls	913 - 9th Street S., Cranbrook, B.C.	Geologist
S. Boyce	Box 414, Westport, Ontario	Student
D. Lister	2355 West 6th Avenue, Vancouver, B.C.	Student
T. Mundle	#8 - 2104 West 37th Ave., Vancouver, B.C.	Student