

STEPHEN SWAIM

**AIRPHOTOGRAPH INTERPRETATION
AND GEOMORPHOLOGY OF THE
MENDOCINA CREEK AREA,
LIVINGSTONE CREEK DISTRICT,
YUKON TERRITORY**

Mike Power, M.Sc., P.Geol.

PLACER LEASE

1 MILE

1W00070

120187

Location: 61°26'N, 134° 15'W
NTS: 105 E8
Mining District: Whitehorse, YT.
Date: January 19, 2001

This report has been examined by
the Geological Evaluation Unit under
Section 41 Yukon Assessment Act
and is recommended as alternative
representation work in the amount
of \$ 1070.00

W. J. Bayne

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

SUMMARY

The Mendocina Creek Property consists of 1 Placer Lease staked at the confluence of Dycer and Mendocina Creeks in the Livingstone Creek area, Whitehorse Mining District, Yukon. The Livingstone Creek area is a historic placer district which has seen gold production since the turn of the century. The Mendocina Creek Property is at on the northern boundary of the area which has been mined since 1901. A series of air photographs were examined to identify prospective areas for placer exploration along the creeks in the area of the property.

A glaciofluvial terrace occurs on the left limit of Mendocina Creek at its mouth where it enters the valley of the South Big Salmon River. Further up the creek are steep sided deposits of apparent till or glaciofluvial sediments, well exposed in the right limit for 5 km up stream. A small recent landslide in the same material occurs on the left limit, 3 km downstream from the confluence with Dycer Creek. At the confluence of Dycer and Mendocina Creeks, a thin sequence of chaotic meltwater sediments appears to be present. Upper Mendocina and Dycer Creeks are apparently underlain by glaciofluvial sediments which may be locally thick. The most prospective areas for locating buried placer deposits are beneath the apparently thick Quaternary deposits on upper Dycer Creek and lower Mendocina Creek.

120187

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1.0 INTRODUCTION

The Mendocina Property is a one mile placer lease at the confluence of Mendocina and Dycer Creeks. Aurora Geosciences Ltd. was retained by Stephen Swaim to examine, using airphotographs, the geomorphology of the area including and surrounding the Mendocina Property. This report summarizes the known bedrock, Quaternary and placer deposit geology of the creeks and contains an interpretation of the geomorphology based on recent air photographs.

2.0 LOCATION AND ACCESS

The Mendocina Creek Property is centred at 61° 26'N, 134° 15'W, approximately 9 km NE of the Livingstone Airstrip on the South Big Salmon River. The property is located approximately 80 km northeast of Whitehorse (Figure 1). It is accessible by fixed wing aircraft from Whitehorse using the 1600 m unmanned Livingstone Creek airstrip. A road extends from the airstrip to the property, running along the east side of the South Big Salmon River. The property is also accessible by winter road from Whitehorse along a route stretching from Long Lake up the east side of Lake Laberge, thence east across the Teslin River and Semenof Hills to the Livingstone Creek airstrip and the property.

3.0 PROPERTY

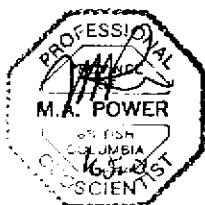
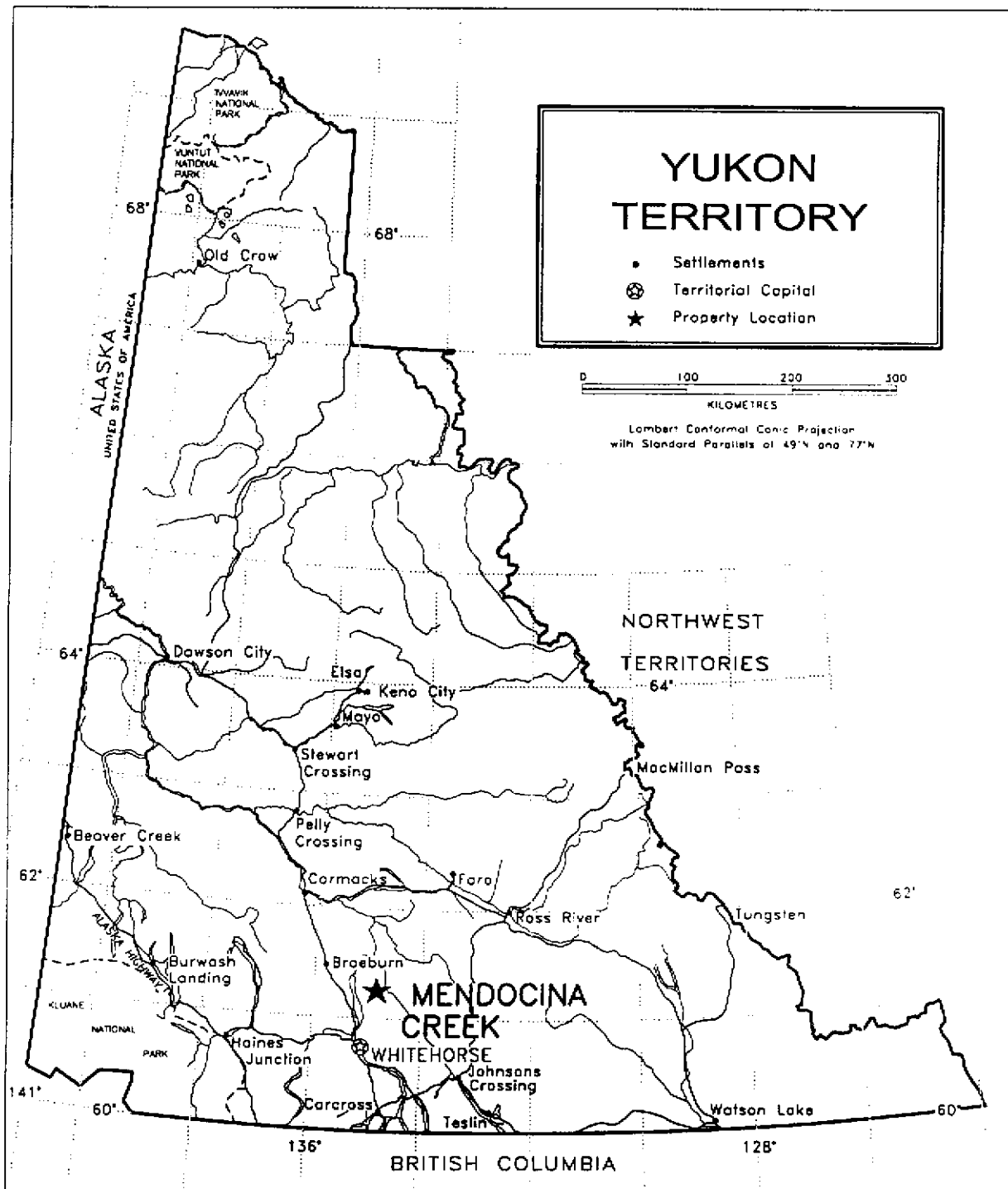
The Mendocina Creek Property consists of 1 un-surveyed placer lease staked under the Yukon Placer Mining Act in the Whitehorse Mining District. The lease location is shown in Figure 2 and claim information¹ is summarized below:

Lease	Record Number	Expiry Date
1 Mile	1W00070	February 17, 2001

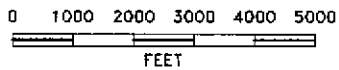
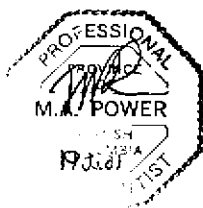
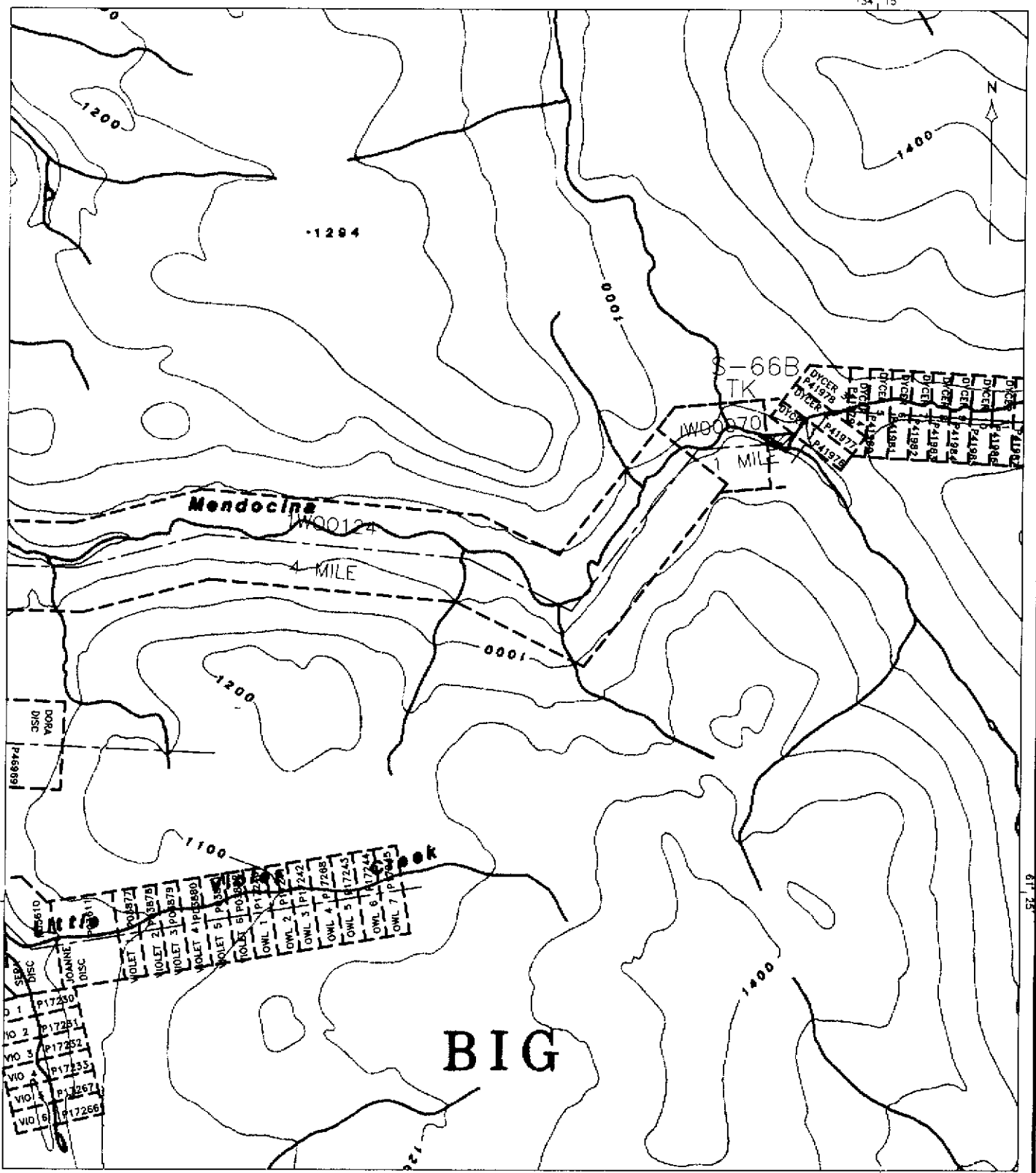
4.0 PHYSIOLOGY AND CLIMATE

The physiology and placer geology of the Livingstone Creek area has been described by McConnell (1901), Bostock (1931), Levson (1992) and Gordey and Makepiece (2000). The Mendocina Property is on the western boundary of the Big Salmon Range of the Pelly Mountains at elevations ranging from 900 to 1100 m. The Big Salmon Ranges, east of the property rise, from a dissected plateau with base level of 1400 m to craggy cirques at elevations of up to 2000 m approximately

¹Claim information provided by the Whitehorse Mining Recorder on January 17, 2001.



STEVEN SWAIM	MENDOCINA CREEK PROPERTY
PROPERTY LOCATION	MINING DISTRICT WHITEHORSE
	NTS: 105 E/8 SCALE 1: 6 000 000
Aurora Geosciences Ltd.	DRAWN BY: HDS
	DATE: 2001.01.12 FIGURE: 1



STEVE SWAIM		MENDOCINA CREEK	
CLAIM LOCATION		MINING DISTRICT: WHITEHORSE	
		NTS: 105 E/8	SCALE 1: 125 000
Aurora Geosciences Ltd.		DRAWN BY: HDS	
		DATE: 2001.01.15	FIGURE: 2

15 km east of the property. Drainages generally flow west although they are locally diverted to the north, possibly by bedrock structures.

The property area is subject to continental climatic conditions with short, occasionally damp summers from June through September and cold, dry winters from October through April. Temperatures range from 15° C during the summer period of mid-June through mid-August to -40° C during the coldest months of winter.

5.0 BEDROCK GEOLOGY

The Mendocina Creek Property is located in the Yukon Tanana Terrane of the northern Cordillera. The area drained by Summit Creek is underlain by a Proterozoic through Paleozoic assemblage of metamorphosed mafic to ultramafic rocks. M. Colpron (2000, *pers comm.*) states that the assemblage in the Livingstone Creek area contains metamorphosed clastic sediments (phyllite and quartzite) as well as marbles and calcareous rocks. Rock strike predominantly north-northwest in the area of the property. The assemblage is bounded by the Big Salmon Fault in the lowlands of the Big Salmon River. This fault is mapped 1200 m west of the Mendocina Creek Property and strikes north-northwest, running along the front of the plateau containing the Big Salmon Range. Bedrock units in the area of the property are summarized in Table I.

Table I. Bedrock rock units - Mendocina / Dycer Creek area
(modified after Gordey and Makepiece (1999))

Formation (age)	Description
Qs Quaternary sediments (Quaternary)	unconsolidated glacial, glaciofluvial and glaciolacustrine deposits; colluvium and landslide debris
CPA1 Anvil Formation (Triassic)	variably altered and foliated, locally augite-phyric basalt (local pillows), diorite and gabbro, chloritic greenstone, amphibolitic greenstone and amphibolite; minor
SDA2 Askin Group (Middle Silurian to Middle Devonian)	dolomite, silty and sandy dolomite, limestone; medium to thick bedded, medium grained mature orthoquartzite; dolomitized laminated mudstone
DMN2 Nasina Assemblage (Devonian - Mississippian)	marble

Formation (age)	Description
DMN4 Nasina Assemblage (Devonian - Mississippian)	quartzite, micaceous quartzite, quartz muscovite and minor metaconglomerate
ODRC2 Road River Formation (Ordovician - Devonian)	recessive, black, limy or dolomitic thin-bedded to platy graphitic siltstone and fine grained impure quartzite with interbedded graphitic silty shale.
CPI4 Ingenika Formation (Proterozoic to Lower Cambrian)	thin bedded slate, siltstone, quartzite and minor limestone with local medium to coarse grained, feldspathic sandstone to orthoquartzite;
PPA1 Slide Mountain(?) (Upper Proterozoic to Paleozoic)	chlorite schist, amphibolite, banded amphibolite gneiss, garnet amphibolite; minor chloritic quartz-mica schist, graphitic quartz-mica schist, quartzite, and limestone
PPA Slide Mountain(?) (Upper Proterozoic to Paleozoic)	metamorphosed mafic rocks; amphibolite and ultramafic rocks (Nisling, Nasina, and Slide Mountain assemblages)

6.0 QUATERNARY & PLACER GEOLOGY

The surficial and Quaternary geology of the Livingstone Creek area including Mendocina and Dycer Creeks is described in Levson (1992) and Klassen and Morison (1987). Quaternary sediments in the study area consist of till blankets, glaciofluvial and glaciolacustrine sediments and glacial outwash deposits. Recent colluvium locally covers these deposits in areas undergoing mass wasting.

The major gold bearing creeks in the district including Livingstone, Summit and Lake creeks drain east from headwaters in the plateau through broad U-shaped valleys down to narrow (20 to 50 m) rock walled canyons and turn sharply to the north upon reaching a linear depression running along the eastern side of the valley containing the Big Salmon River. A similar depression occurs north of This depression is bounded on the west by hills up to 50 m high, on the east by the rising hills of the plateau and the trough extends for 6 km from Livingstone Creek in the south to Lake Creek in the North. The linear depression is parallel to the Big Salmon Fault, and to the general strike of stratigraphy in the area; it appears to be a bedrock-controlled feature.

There are several theories concerning the origin and preservation of placer deposits in the Livingstone Creek area. Gold appears to be derived from mesothermal quartz

veins within nearby schists and phyllites. Auriferous placer deposits occur in coarse interglacial gravels preserved beneath fine grained glaciolacustrine deposits. The pay gravels contain boulders of local rock and granite, are poorly sorted, subangular to subrounded, and are reportedly iron stained in many localities (Bostock, 1931). Levson (1992) points out that thick sediments derived from ice marginal lakes blanket the placer deposits and likely assisted in preserving them. McConnell (1901) asserts that the orientation of the gold-bearing drainages transverse to the mean direction of local ice flow may also have played a part in the preservation of placer deposits in the area. In summary, auriferous placer deposits in the Livingstone Creek area are found in coarse, commonly iron stained gravels on bedrock within the active stream beds and on benches marginal to the present drainages. The placer deposits are preserved beneath a sequence of sands, silts, gravel and lesser clay, locally up to 60 m thick. Individual pay streaks are in the order of 3 to 5 m thick and 10 to 20 m wide.

The Mendocina and Dycer Creek drainages are on the northern limit of the historical mining areas in the Livingstone Creek district. Little Violet Creek is the next drainage south of Mendocina Creek and, while shorter, is parallel to it. Little Violet Creek has seen placer production since the turn of the century and was one of the few active creeks during the 1930's (Bostock 1957). The only recorded instance of recent work in the Mendocina and Dycer Creek drainages was an exploration program conducted by Wayne Tatman during August 1990 (Placer Mining Section, 1991). A seven man crew excavated a number of test pits on the left limit of Dycer Creek using a CAT D6 bulldozer, and CAT 931 and 977 loaders. Only thin overburden (< 3m) was encountered in the pits.

5.0 AIR PHOTOGRAPH INTERPRETATION

The airphoto interpretation was conducted using the following air photographs:

Flight	Photographs	Scale
A200060	35-43	1:50,000

The air photography was examined with a stereoscope and units were delineated on the basis of shape, texture and elevation. The units identified were also correlated with map units identified by Klassen and Morison (1987). Figure 3 (back pocket) is an airphoto mosaic with the bedrock geology and interpreted surficial geology overlain upon it.

**Table II. Interpreted surficial sediment units
Mendocina / Dycer Creek area**

Unit (Interpreted source)	Description
<p>1 (Recent glaciofluvial gravels)</p>	<p>Flat to locally irregular, sparsely vegetated (? willow), confined to creek bottom. Stream wavelength to 500 m where not locally deflected by bedrock.</p>
<p>2 (Quaternary glaciofluvial terrace deposit marginal to South Big Salmon River drainage)</p>	<p>Irregular surface, several small circular ponds and depression with a weak relict radiating lineation pattern originating at the mouth of the upstream canyon</p>
<p>3 (Quaternary till)</p>	<p>Steep walled, light coloured, resistant, rilled in a regular pattern on the north side of Mendocina Creek, with a gently sloping top surface, terminating against inferred bedrock. The region south of the creek for several km appears to be underlain by the same material. Generally irregular texture to the plateau south of the creek, poorly drained, with a few possible bedrock controlled highs.</p>
<p>4 (Recent land slide)</p>	<p>Small scarp (350 m long x 250 m wide) on south side of Mendocina Creek exposing light coloured overburden (?till). Toe of slide does not significantly deflect the creek.</p>
<p>5 (Quaternary meltwater complex)</p>	<p>Rough, locally steep sided, apparent outcrop in some locations, light coloured till in most locations. Stream wavelength 100 m or less.</p>
<p>6 (Quaternary glacial outwash)</p>	<p>Flat to gently sloping, smooth, consistently vegetated, perhaps thicker than 6 based on meander wavelength (150 m). 500 m x 100 m terrace along upper Mendocina Creek (north flowing section)</p>

In general terms, it appears that lower Mendocina Creek is covered with glacial till or glaciofluvial outwash deposits. The junction of Dycer and Mendocina Creeks is covered by an apparent meltwater complex. Overburden appears to be thin in this area with apparent bedrock outcrop found throughout Unit 5. The sediments in Dycer Creek and upper Mendocina Creeks may be locally quite thick. There is a high terrace on the right limit of Mendocina Creek above the confluence of Dycer Creek and the meander pattern in Dycer Creek suggests that bedrock is not affecting the drainage pattern in the valley bottom. In contrast, the stream pattern below the Dycer Creek / Mendocina Creek junction show shorter, more irregular wavelengths suggesting the influence of bedrock on the drainage pattern. Consequently, it would appear that the recent drainage has cut through most of the Quaternary section in lower Mendocina Creek whereas they may be thick, uneroded sections of Quaternary sediments in Dycer Creek. Overburden appears to be thin at the mouth of Dycer Creek and thickens rapidly within 1 km upstream.

The most likely locations for economic placer gravels on Mendocina and Dycer Creeks would appear to be 1 km upstream of the confluence of Dycer and Mendocina Creeks, beneath glaciofluvial deposits on the right limit of upper Mendocina Creek and beneath glacial till on the right limit of lower Mendocina Creek, approximately 3 km below the Dycer / Mendocina Creek junction.

6.0 CONCLUSIONS

The results of this interpretation support the following conclusions:

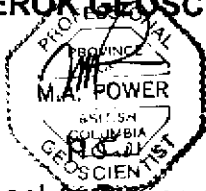
- a. Glacial till and / or glacial fluvial deposits are present on the lower end of Mendocina Creek on the right limit, in terraces at the mouth of Mendocina Creek, on the right limit of upper Mendocina Creek within 1 km of its confluence with Dycer Creek and on Dycer Creek, 1 km upstream from its mouth.
- b. Sediments in the area of the Mendocina Property at the mouth of Dycer Creek consist of thin glacial outwash sediments overlying bedrock. This inference is supported by excavations on the lower end of Dycer Creek.

7.0 RECOMMENDATIONS

The following recommendations are made based on the conclusions of this work:

- a. Exploration work should focus on glaciofluvial sediments and glacial tills where the possibility exists of locating economic pay gravels beneath the capping glacial sediments.

Respectfully submitted,
AMEROK GEOSCIENCES LTD.



Michael A. Power, M.Sc. P.Geo.
Geophysicist

REFERENCES CITED

Bostock, H.S.

1931: The Mining Industry of the Yukon. in: Bostock, H.S. (1957) Yukon Territory - Selected Reports 1898-1933. Ottawa: Department of Energy, Mines and Resources. Geological Survey of Canada Memoir 284. p620-623.

Levson, V.

1992: The sedimentology of Pleistocene deposits associated with placer gold bearing gravels in the Livingstone Creek area, Yukon Territory, Canada. in: INAC. Yukon Geology Volume 3 1992. Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada.

Gordey, S.P. and Makepiece, A.J.

2000: Yukon Digital Geology (interactive compact disc). Exploration and Geological Services Division, Yukon: Open File 1999-1D.

Klassen, R.W. and Morison, S.R.

1987: Surficial geology: Laberge, Yukon Territory. Geological Survey of Canada Map 8-1985. Scale: 1:250,000.

McConnell, R.G.

1901: Salmon River gold field including Livingstone and neighboring creeks. in: Bostock, H.S. (1957) Yukon Territory - Selected Reports 1898-1933. Ottawa: Department of Energy, Mines and Resources. Geological Survey of Canada Memoir 284.

Placer Mining Section

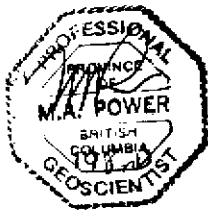
1991: Yukon Placer Industry 1989 to 1990. Mineral Resources Directorate, Yukon, Indian and Northern Affairs Canada.

APPENDIX A. CERTIFICATE

I, Michael Allan Power, with residence and business address in Whitehorse, Yukon Territory do hereby certify that:

1. I hold a B.Sc. (Honours) in Geology granted in 1986 and M.Sc. in Geophysics granted in 1988, both from the University of Alberta.
2. I have been actively involved in mineral exploration in the northern Cordillera and in the Northwest Territories since 1988. I am a professional geoscientist registered with the Association of Professional Engineers and Geoscientists of British Columbia (Registration number 21131) and a professional geophysicist registered by the Northwest Territories Association of Professional Engineers, Geologists and Geophysicists (licensee L942).
3. I conducted the geophysical surveys described in this report, interpreted the data collected and prepared this report.
4. I have no interest, direct or indirect, nor do I hope to receive any interest, direct or indirect, in the property of Stephen Swaim.

Dated this 19th day of January 2001 in Whitehorse, Yukon Territory.

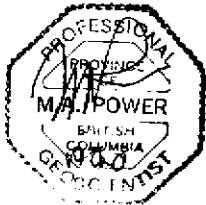


Michael A. Power, M.Sc. P.Geo.
Geophysicist

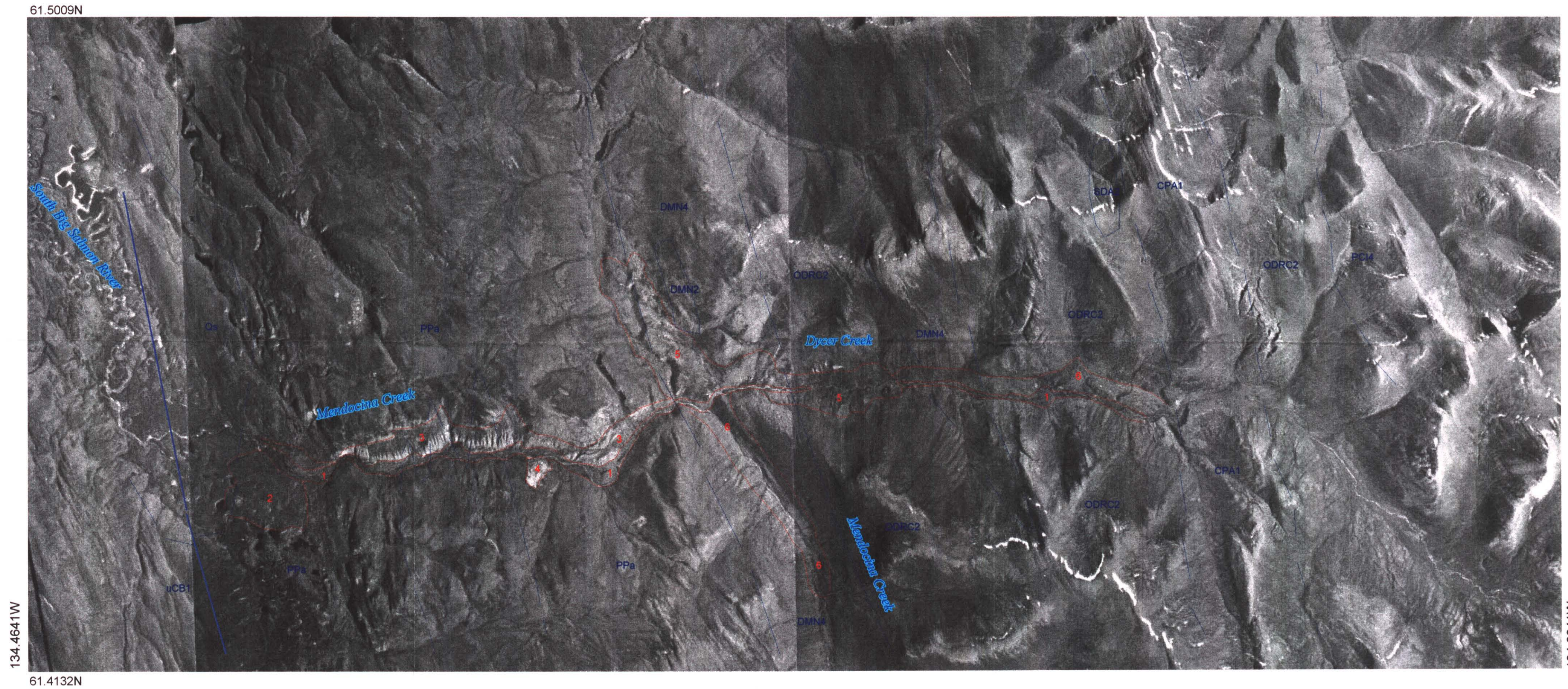
APPENDIX B. STATEMENT OF EXPENDITURES

Airphotographs	\$90.00
Interpretation and report	\$850.00
Reproduction and plotting	<u>\$130.00</u>
Total project expenses	<u>\$1070.00</u>

I certify that these expenses are correct to the best of my knowledge.



Michael A. Power, M.Sc., P. Geo.
Geophysicist



LEGEND

- Bedrock unit - contact
- Fault
- Surficial unit - contact

Bedrock geology from Gordey and Makepiece (1999).

Surficial geology based on airphotos and Klassen and Morison (1987)

Air photographs A20006 (1998) 35-43
Scale: 1:50,000

Unit identifiers per Tables I and II in text

CLAIMS: PL 1W00070

NTS: 105 E/8

MINING DISTRICT: WHITEHORSE

PROJECTION: EQUIANGULAR

SCALE: 1:41,270

STEPHEN SWAIM

MENDOCINA CREEK PROPERTY

**AIR PHOTOGRAPH INTERPRETATION
& BEDROCK GEOLOGY**

