

900327

Department of Energy Mines and Resources
Mineral Assessment

Special Management Areas (SMA's)

White River First Nation

Klwanz FM.

The White River & Klwanz FM
currently share a TT in
the SW corner of the
Yukon. The boundary
btwn the two First
Nations is not
finalized to date.

The White River First Nation (WRFN) has proposed three SMA's in their traditional territory. The three areas selected are to be designated as Habitat Protection Areas (HPA) and have been approved by the Cabinet of the Government of Yukon (YTG). The final boundaries have been determined for the Scottie Creek and Pickhandle Lakes SMA's while the final boundary of the Wellesley Lake SMA has not been determined.

The proposed SMA's are not public and are awaiting the details of the Final Land Claim's Agreement for the White River First Nation. Klwanz FM.

Mineral assessments are required land use planning information to be used for the management of the proposed SMA's. The geology, reconnaissance geochemical silt sediment samples, areomagnetic survey and minfile occurrences have been compiled for the region covering the proposed SMA's to prepare this regional assessment and to outline field work required to complete detailed mineral assessments.

Regional geological mapping was carried out by the GSC between 1970 – 72 and reported in GSC OF 73-41, Reconnaissance Geology of Aishihik Lake, Snag and Part of Stewart River Map-Areas, West-Central Yukon; by D.J. Templeman-Kluit; Map 16-1973. The regional geology is shown on the accompanying figures taken from the digital compilation produced by Gordey and Makepeace (2000).

A regional mineral assessment study of the areas was completed in December of 2001. The proposed Scottie Creek SMA covers an area of moderate to low relative regional mineral potential. The proposed Wellesley Lake SMA covers an area of high to moderate relative regional mineral potential. The proposed Pickhandle Lakes SMA covers an area of relative high regional mineral potential.

1. Scottie Creek proposed SMA NTS 1154 K/10&15

1.a. Introduction

The area of the proposed SMA is 512.4 square kilometers and is located adjacent to the Alaska-Yukon border centered on Mount Scottie 53 kilometers north of Beaver Creek. The area includes the wetlands along Scottie Creek. Access to the proposed SMA is by helicopter.

The road to the active Moosehorn Range gold placers and Longline projects crosses the proposed Scottie Creek SMA. The winter road departs the Alaska Highway north of Beaver Creek and follows the Scottie Creek drainage north to the Moosehorn Range crossing the Yukon-Alaska boundary at several locations north of the proposed SMA.

1.b. Exploration History

One claim block has been staked in the area in 1956 and re-staked in 1976. There are no active quartz mineral or placer claims in the area. The region has been prospected for placer gold deposits. There is no record of placer mining within the proposed SMA.

§ A total of five SMAs have been proposed for the two first Nations with Klwane managing the proposed Klwane Nation park SMA and co-managing with WRFM the proposed Asi Keyi NEP SMA that is currently Interim Protected.

▣ The FNs also propose to co-manage Pickhandle lakes HPA SMA while WRFM will manage the proposed Scottie Creek and Wellesley lakes SMAs.

1.c. Regional Geology

The proposed Scottie Creek SMA is located the Yukon Tanana Terrane rocks of western Yukon.

The southern half of the area is underlain by Carboniferous to Permian aged Klondike Schist. The Klondike Schist is composed of a poorly understood assemblage of metamorphosed pelitic/volcanic rocks, minor marble and phyllite of uncertain association. There is no geological information of detailed mapping within the Klondike Schist in the area of the proposed SMA.

The Klondike Schist is in contact with the Jurassic aged Aishihik Suite of foliated biotite-hornblende granodiorite in the northern portion of the SMA area and intruded by mid-Cretaceous aged Whitehorse Suite granitic rocks and Early Tertiary aged Nisling Suite plutonic rocks of intermediate composition.

1.d. Minfile Occurrences

A single Yukon Minfile occurrence (115K 087) is recorded in the area. It is an unknown type occurrence with commodities unknown. The claims were originally staked in 1956 near the contact of the mid-Cretaceous stock in the north central portion of the area.

1.e. Regional Silt Sediment Geochemistry

Approximately 35 samples were taken within the proposed SMA area. The accompanying figures show the sample locations and posted analytical results for 18 elements, pH and loss on ignition in the region. The original survey results were released in GSC OF 1363.

The proposed SMA is in an unglaciated area of the Yukon.

Base Metals –

Moderately anomalous zinc values include two samples within the Klondike Schist (85 and 92 ppm) on separate drainages west of Scottie Creek. A third sample (80 ppm) is located on a drainage from north of the proposed SMA underlain by Aishihik Suite granodiorite. The remaining results range from 47 – 74 ppm zinc.

None of the other base metals indicate anomalous results for the regional survey. Nickel values range from 14 – 24 ppm. Copper values range from 11 – 36 ppm. Lead values range from 3 – 9 ppm.

Precious Metals –

Three samples yielded detectable gold values. A sample near the southeast corner of the proposed SMA assayed 19 ppb in an overburden-covered area probably underlain by Klondike Schist. Two samples draining the mid-Cretaceous stock yielded values of 7 and 9 ppb gold. Silver values are consistently at the detection limit of 0.1 ppm.

Other Metals –

An anomalous tin sample (14 ppm) from a stream in the northeastern corner of the proposed SMA drains an area underlain by an Early Tertiary Nisling Range Suite stock.

Three samples containing moderately anomalous mercury values (55 – 90 ppb) occur on drainages west of Scottie Creek. Two samples are on streams draining the mid-

Cretaceous stock (one coincident with the anomalous gold value). A fourth sample yielded 65 ppb on a stream draining an early Tertiary Nisling Range stock.

Cobalt values are low to moderate in range and are dispersed throughout the area. There are seven samples that range from 11 – 20 ppm.

Molybdenum and tungsten are at or below detection limits throughout the area.

Barium values are consistently low (204 – 660 ppm) as are the manganese metal values that range from 173 – 3840 ppm.

Iron values are generally in the low range. One sample coinciding with the high arsenic value assayed 6.94 %. The remainder of the sample values ranges from 1.36 – 2.65 % with one of the samples draining the mid-Cretaceous stock at 3.5 % coincident with the 90 ppb mercury sample.

Uranium results are moderately anomalous on streams draining the Nisling Range Suite stocks and along the southern margin of the mid-Cretaceous stock. These five samples range from 3.4 – 4.7 ppm.

Indicator Elements –

Antimony, arsenic and cadmium are generally in the low range of the regional survey. The highest values of cadmium are 0.4 ppm on streams draining the mid-Cretaceous stock. A single sample site yielded a value of 25-ppm arsenic at the northwest corner of the proposed SMA on a stream draining a portion of the Aishihik Suite batholith.

Fluorine results are slightly elevated on the east side of Scottie Creek from streams draining all rock units.

The pH values below and above neutral are presented on each plot as a background to the sample site. Blue indicates a value above neutral and light red indicates a value below the neutral level. Values are evenly distributed throughout the area.

The LOI values are presented on a separate plot. The results indicate that the organic content of the samples is generally low.

1.f. Aero-magnetic survey

The regional aeromagnetic survey results indicate a relatively strong trend with the southern contact zone of the mid-Cretaceous pluton that crosses through the center of the proposed SMA. Amorphous high zones occur within all the plutonic rocks in the proposed area.

1.g. Metallogeny

The regional mineral assessment evaluated the potential for gold-quartz veins and plutonic related gold associated with the mid-Cretaceous pluton. The Klondike Schist in the Yukon Tanana Terrane has vms/sedex potential. The Nisling Range Suite intrusive rocks have potential for hosting molybdenite, copper and tungsten porphyry and tin-tantalum mineralization.

Rocks of the Yukon-Tanana Terrane were deposited in a dynamic Paleozoic magmatic arc system. The system evolved through events of arc-building, arc rifting, development

of back-arc basins and episodes of contractional deformation. The system is favorable for the development of VMS and related sedex mineralized deposits. Rocks of the Permian aged Klondike Schist host Kuroko type VMS mineralization in felsic volcanic rocks near Dawson north of the proposed SMA. Gold quartz veins are hosted in the Klondike schist in the Klondike district.

The plutonic suites are potential sources for porphyry copper-molybdenum and plutonic related gold and other metal deposits. The plutonic related deposits include vein, vein stockwork, vein breccias, sheeted vein, shear hosted and skarn styles of mineralization within the intrusions or enveloping rocks.

Early Jurassic plutonic rocks host the important Minto and Williams Creek deposits. These plutonic rocks are of a similar age and setting to the Aishihik Lake batholith that outcrops in the northern portion of the proposed SMA.

The Middle Cretaceous granodiorite of the Whitehorse Suite is similar to stocks hosting copper-gold-molybdenum porphyry deposits at Mount Nansen and Casino. Younger breccia zones within the stocks appear to be the source for the mineralization. Polymetallic veins and gold-quartz breccias are associated with these porphyry systems.

The Nisling Range Alaskite stocks are potential host for related gold mineralization, molybdenum-copper-tungsten porphyry and tin mineralization as cassiterite veins or porphyry systems.

1.h. Conclusions and Recommendations

The proposed Scottie Creek SMA has a limited exploration history and relatively low metal values detected in the Regional Reconnaissance Stream Sediment survey. It does have potentially favorable geological environments that rank in the moderate range of the regional mineral potential. *survey.*

A detailed mineral assessment is recommended for the proposed SMA following a field season of geological mapping and geochemical sampling. Two area visits are recommended. An initial field trip to carry out mapping and sampling with a follow-up visit to check on potential anomalous analyses.

Geological mapping within the Klondike Schist assemblage is recommended to identify the rock types within the area, specifically to identify possible felsic volcanic and sedimentary rock units. Metamorphic sedimentary and volcanic rock units are potential hosts for stratiform base metal mineralization. There are no records of detailed mapping within the Klondike Schist assemblage in the proposed SMA. Mapping is recommended to identify lithostratigraphic units within the assemblage to determine the geological environment and assess for potential exploration models. Detailed mapping/prospecting with particular attention to the plutonic contact zones and traverses across the plutons is also recommended to assess for a broad suite of metals.

Multi-element litho-geochemical and detailed soil and/or silt sampling should be carried out from outcrops of all rock units, streams and across stratigraphic or structural zones in overburden covered areas.

Approximately 12 man-day traverses are required to carry out the initial evaluation. There will be an estimated 100 rock and 100 silt or soil samples collected in the first phase of mapping with an additional 25 samples in the follow-up examination. The follow-up examination of prospective areas will depend upon the initial analytical results. The fieldwork is to be supported by helicopter in four two-man fly camps.

Wellesley Lake proposed SMA NTS 115 J/5 & 115 K/8

Habitat Protection Area

2.a. Introduction

The proposed Wellesley Lake SMA has a core area of 174.11 square kilometers and a surrounding study area of 341.25 square kilometers. The proposed SMA is centered on Wellesley Lake located 70 kilometers east of Beaver Creek. Access to the proposed SMA area is by helicopter.

The proposed SMA is centered on Wellesley Lake and surrounding wetlands. The study area encloses several low-lying hills that may contain rock outcrop.

2.c. Exploration History

There is no known exploration activity in the immediate area of the proposed SMA and no reported Yukon Minfile occurrences are reported for the proposed area.

2.d. Regional Geology

The Wellesley Lake proposed SMA is located in the Yukon-Tanana and Windy-McKinley Terranes.

There are two areas of outcrop mapped within the proposed SMA. Devonian to Cretaceous aged Windy assemblage consisting of an oceanic assemblage of ultramafic rocks, greenstone, chert, carbonate and metamorphosed equivalents trending northerly underlies the center of the area. The Upper Cretaceous Carmacks Group volcanic succession dominated by basic volcanic strata possibly outcrops along an east-west ridge near the southern boundary of the proposed SMA.

The western portion of the proposed SMA is overburden covered in a low lying area that may be underlain by rocks of the Klondike Schist assemblage.

2.e. Yukon Minfile Occurrences

There are no Yukon Minfile occurrences reported for the proposed Wellesley Lake SMA.

2.f. Regional Silt Sediment Stream Geochemical Survey

There are approximately 30 silt sample results reported from drainages within the proposed Wellesley Lake SMA and study area. The original survey results were reported in GSC OF 1363. The accompanying maps show the sample locations and results for 18 elements, loss on ignition and pH.

The proposed SMA contains the 72.3 square kilometer Wellesley Lake and a major portion of the surrounding wetlands. The area is also within a partially glaciated region. The loss on ignition sample results generally show high levels of organics in the samples.

? generalized ice flow directions? from Glacial limits map?

Base Metals –

Two samples with relatively high zinc values occur on streams draining the proposed SMA. One sample yielded an analysis of 392 ppm from a stream drainage on the northeast side of the proposed SMA. The underlying geology is not known and appears to be outside the area of the interpreted Windy Assemblage. The nearest outcrops are of Carmacks Group volcanics. The second sample yielded an analysis of 216-ppm zinc

within the proposed study area on the northwest side. The stream drains an area underlain by Windy Assemblage of oceanic rocks.

An additional sample yielded an analysis of 261-ppm zinc north of the proposed SMA but draining an area underlain by the Windy Assemblage on the stratigraphic trend immediately north of the proposed SMA study area. Three samples with moderately anomalous results are on streams in the northern portion of the proposed SMA and study area also draining Windy Assemblage rocks. The results ranged from 82 – 86 ppm zinc.

Four samples draining Carmacks Group volcanics on the south side of the proposed study area are moderately anomalous ranging from 77 – 89 ppm zinc. The streams likely drain areas outside of the proposed SMA study area. The remainder of the sample results yielded analytical values ranging from 32 – 70 ppm zinc.

Lead analyses results of the stream sediments in the area are 10 ppm or less with one sample yielding an analysis of 14 ppm lead just north of the west end of Wellesley Lake. Rocks of the Windy Assemblage probably underlie this drainage area.

The results of copper analysis for the stream sediments in the proposed SMA are grouped in two categories. Low levels range from 11 – 24 ppm copper and moderate values range from 36 – 60 ppm copper. The moderate level samples tend to cluster around the western end of Wellesley Lake. Rocks of the Windy Assemblage and the Klondike Schist Assemblage underlie the area.

Nickel values are generally low in the proposed SMA and study area ranging from 7 – 30 ppm. Two moderately anomalous values (31 and 34 ppm) occur on streams draining the ultramafic package of rocks of the Windy Assemblage at the north end of Wellesley Lake. Anomalous samples greater than 50-ppm nickel occur on streams draining the ultramafic rocks in an outcrop area five kilometers north of the proposed SMA and study area.

Precious Metals –

Two samples in the proposed SMA area yielded gold values above the detection limit. One sample (13 ppb) at the mouth of a creek on the south shore of Wellesley Lake drains an area underlain by Carmacks Group volcanics. The second sample (9 ppb) in the western portion of the proposed SMA and study area is located on a stream draining an area underlain by Windy Assemblage rocks or Klondike Schist.

There are no significant silver in stream sediment samples on creeks draining areas within the proposed SMA and study area.

Other Metals –

At least three samples from creeks draining areas within the proposed SMA and study area have moderately “interesting” values (6 – 8 ppm). These are from creeks draining into the north end of Wellesley Lake in areas underlain by Windy Assemblage Rocks. The amorphous aero-magnetic response in the area possibly indicates the presence of Nisling Range Alaskite stocks.

There are a number of moderate to high anomalous assay results for mercury from streams within the proposed SMA and study area. The values for the moderate range are within 55 – 100 ppb and for the high range are 105 – 155 ppb. The high range values are from streams draining the inferred trend of the Windy Assemblage rocks through the center of the proposed SMA and study area.

*for which elements?
Co₂*

Two samples in the high analytical range for cobalt are located on streams draining Windy Assemblage rocks northwest of Wellesly Lake.

Two samples of moderate range (4 – 8 ppm) for molybdenum are also located northwest of Wellesly Lake in streams draining rocks of the Windy Assemblage.

Tungsten results from streams within the proposed SMA and study area are at or below detection limits.

Barium values throughout the area are generally in the low range (100 – 680 ppm) with two samples of greater than 800-ppm. The two samples are from streams draining the Windy Assemblage rocks northwest of Wellesly Lake.

There are five samples within or along the edge of the proposed SMA and study area that yielded manganese values of greater than 2100-ppm. The highest value (14,400-ppm) is on a stream draining Windy Assemblage rocks northwest of Wellesly Lake.

The analytical results for iron from the RGS samples are generally in the low range (0 – 3.0 %) with several samples greater than 3.0 % from creeks draining Windy Assemblage rocks trending through the center of the proposed SMA and study area.

The RGS sample results for uranium are generally in the low range of 0.3 – 2.6 ppm with one sample on the north shore of Wellesly Lake yielded a result of 3.2-ppm.

There are 5 – 6 samples with elevated results (325 – 390 ppm) for florine from streams draining Windy Assemblage rocks trending through the central portion of the proposed SMA and study area.

Indicator Elements –

The antimony results from the RGS samples indicate three moderately high values (1.0 – 1.8 ppm) in the center of the proposed SMA core area surrounding Wellesly Lake. The streams appear to drain Windy Assemblage rocks.

Arsenic values from RGS sample within the proposed SMA and study area are all in the low range (detection – 10-ppm). Two samples on the eastern side of the proposed SMA and study area are on streams draining from the study area yielded results of 14 and 15-ppm in areas underlain by Carmacks Group volcanic rocks.

The cadmium results from the RGS samples are generally in the low range (0.11 – 0.3 ppm). Three samples (0.40 – 0.60 ppm) are located on streams draining Carmacks Group volcanics on the east and south sides of Wellesly Lake.

Ph values are in the above neutral range in the low lands around Wellesly Lake and tend to be below the neutral level in the higher elevations.

The LOI values as previously noted are generally in the high range throughout the proposed SMA and study area up to 98.0 (% ?).

↑ ✓ %

2.f. Areo-Magnetic Survey

There is a high magnetic trend that crosses through the proposed SMA and study area. A discontinuous trend of magnetic highs trends easterly from the southwest corner of the area and changes to a northerly trend, and crossing Wellesly Lake carrying on north of

ES

the area. The magnetic trend correlates with outcrops of the ultramafic units of the Windy Assemblage.

2.g. Metallogeny

The regional mineral assessment panel evaluated the potential for gabbroic Ni-Cu, plutonic related gold, gold-quartz vein, epithermal low sulphur gold and VMS Kuroko type deposits in the rocks within the proposed SMA, study area and surrounding rocks. The results of the evaluation indicated that the area lies within relative high to moderate regional mineral potential.

The ultramafic rocks of the Windy Assemblage are mappable using the aero-magnetic survey plot to project rock formations in outcrop through the low-lying wetlands and vegetative covered hills. The RGS results indicate that the ridge of Windy Assemblage rocks north of Wellesly Lake is prospective and warrants field examination. The potential for nickel-copper mineralization within the ultramafic rocks is relatively limited for the proposed SMA area but is an important deposit type to be considered. Exploration of Windy Assemblage rock in Yukon has been limited to staking and surface examination of aero-magnetic anomalies.

Carmacks group volcanics along the south and east sides of the proposed SMA and study area have modest potential for hosting epithermal type gold mineralization. The presence of a detectable gold-in-sediment sample in the area may be indicative of greater potential and warrants further evaluation.

The greenstone and metamorphosed rocks north of Wellesly Lake have potential to host gold-quartz veins and warrant field evaluation. The VMS potential is related to the greenstone (metamorphosed mafic volcanic rocks) of the Windy Assemblage or the possibility of Klondike Schist rocks underlying the low lands on the western side of the proposed SMA and study area.

2.h. Conclusions and Recommendations

The proposed Wellesly Lake SMA and study area is largely in a low-lying wetland environment with limited outcrop exposure anticipated. Exposures of Carmacks Group volcanics along the southern boundary warrant examination. The more resistant Windy Assemblage underlies the hills on the northern boundary of the proposed SMA. The aero-magnetic and RGS survey results in the area and especially on trend to the north of the proposed SMA are very prospective and rank in the high relative regional mineral potential study. The primary targets within the assemblage are ultramafic related nickel-copper and Besshi type VMS deposits. *those*

A program to map possible outcrops and increase the silt sediment sample density is recommended. The work is to focus on the Windy Assemblage in the northern part of the proposed SMA and the Carmacks volcanics along the southern border of the SMA. Mapping of stratigraphic units, mineralization and alteration systems are the priorities. The alteration systems are important in the Carmacks Group volcanics. Ultramafic and mafic volcanic lithologies will be mapped and sampled from the Windy Assemblage. *highest category on the*

The field examination will require four-man days and collection of approximately 50 rock and silt samples to be analysed for a multi-element suite including gold. Samples of rock types and for whole rock analysis will also be collected.

2. Pickhandle Lake proposed SMA NTS 115 F/16

3.a. Introduction

The proposed Pickhandle Lake SMA has an area of 57.08 square kilometers. The proposed SMA is located on the south side of the Alaska Highway southeast of the Donjeck River crossing. The area is a wetland valley bottom within the Denali Fault Zone.

3.b. Exploration History

There are no records of exploration within the area of the proposed SMA. Claims immediately north of the highway were staked and explored to follow up on gold mineralization in a shear zone (Yukon Minfile 115F 093). A rock sampled yielded an analysis of 3,100 ppb gold. Follow up exploration consisted of detail stream and soil sampling, prospecting and geological mapping. The Pick claims were staked and explored by Noranda Exploration in 1985.

- are they still valid?

3.c. Regional Geology

The area of the proposed SMA is a low-lying, overburden-covered wetland located within the Denali Fault zone.

Devonian – Cretaceous aged Windy Assemblage metamorphic rocks have been mapped along trend.

Pennsylvanian-Permian aged Skolai Group volcanic rocks outcrop on the ridge to the south of the proposed SMA. Within the Skolai Group is a narrow belt of Late Triassic and older Kluane Ultramafic Suite rocks that hosts the Canalask Nickel-Copper deposit two kilometers west of the north end of the proposed SMA.

3.d. Minfile Occurrences

There are no occurrences listed in the Yukon Minfile within the area of the proposed Pickhandle Lake SMA.

Ultramafic related nickel-copper sulphide mineralization with associated PGE's, base metal skarn and veins are relatively abundant in the Wrangellia Terrane rocks south of the Denali fault.

Occurrences north of the Denali fault are rare although a number of magnetic anomalies associated with the Windy Assemblage ultramafic suite have been staked in the past.

3.e. Regional Silt Sediment Geochemistry

There are three silt sediment sample locations within the proposed SMA, all of which drain rocks from the southern boundary.

The area has been glaciated and is a low-lying wetland. The use of geochemical silt or soil sampling in the area is not considered to be practical.

3.f. Aero-magnetic Survey

The regional aero-magnetic survey results indicate a broad linear trend of relative low magnetic susceptibility associated with the Denali Fault Zone.

what about
the Kids
quartz claims
& Weng claims
on NE & NW
edge of SMA?
owner
Kids - Nick Urban
Weng - Archer
Cathro
Possiblz
Overlap with
SMA

3.g. Metallogeny

Windy Assemblage metamorphic or carbonate rocks in contact with Nasina Assemblage metamorphosed sedimentary rocks are extrapolated to underlie the proposed SMA. There are no outcrops within the proposed SMA and the areo-magnetic survey indicates little likelihood of ultramafic rocks within the area.

3.h. Conclusions and Recommendations

The proposed Pickhandle Lake SMA is in a low-lying wetland in a readily accessible area. There are no indications of mineralization within the area.

A brief examination of the area from the Alaska Highway is warranted to further assess the potential for outcrops.