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Mineral Assessment of Ahtna, Inc. Selections in the Wrangell-St. Elias National Park and Preserve, Alaska

1997 Preliminary Report

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MINERAL ASSESSMENT OF AHTNA, INC. SELECTIONS IN THE WRANGELL - ST. ELIAS NATIONAL PARK AND PRESERVE, ALASKA. 1997 PRELIMINARY REPORT

ABSTRACT

During 1997, the Bureau of Land Management started the first year of a multi-year mineral assessment of Ahtna, Inc. Regional Native Corporation Alaska Native Claim Settlement Act (ANCSA) selections within the Wrangell-St. Elias National Park and Preserve, Alaska. The assessment was conducted to provide Ahtna, Inc. with minerals information to assist them in finalizing their regional selections within the park.

A literature search by the Bureau of Land Management, identified 74 mineral occurrences located within a 1-mile radius of the Ahtna, Inc. selections. For this report 55 were considered important enough to be included in this mineral assessment. Of those 55 occurrences, 9 were historically producing mines, 27 were development prospects, 12 were exploration prospects, and 7 were raw prospects. A majority (47) of the properties were lode deposits and the remainder (8) were placer deposits. Historically producing mines included the Caribou Creek placer mine, the Nabesna, Rambler, and Royal Development Co. Mines in the northern Wrangell Mountains and the Berg Creek, Clear Creek, Copper King, Mullen, and the Silver Star Mines in the southern Wrangell Mountains.

During the 1997 field investigation, 26 occurrences (8 in the northern area and 18 in the southern area) were located and sampled, 2 were visited but not sampled, 4 were not located but the surrounding area was sampled, 17 were looked for but not located, and 7 were not looked for due to time and weather constraints.

Investigations in the northern Wrangell Mountains area disclosed no significant mineral occurrences other than the Nabesna, Rambler, and the Royal Development Mines. The Nabesna and Royal Development Mines are patented and privately held, while the Rambler Mine is under investigation by the National Park Service for validity, with the outcome determining the availability of this property for selection.

The southern Wrangell Mountains area contained 11 properties with significant mineral values, though 3 are located just outside the selection boundaries and are unavailable for selection. Those significant properties inside the boundary include the Ammann Prospect, the Berg Creek Mine, the Copper King Mine, the Clear Creek Mine, the Hidden Treasure prospect, the Homestead prospect, the Mullen Mine, and the Silver Star Mine. The three properties located outside the boundary include the Bluebird prospect, the Cave Prospect, and Falls Creek prospect. Five properties in the southern area have been patented and include the Copper King Mine, the Clear Creek Mine, the Mullen Mine, the War Eagle prospect, and the Warner prospect.

INTRODUCTION

During 1996, the National Park Service (NPS) asked the Bureau of Land Management (BLM) to provide comprehensive minerals information to assist in the relinquishment of overselections made by Ahtna, Inc. Regional Native Corporation (Ahtna) within the Wrangell-St. Elias National Park and Preserve, Alaska (Figure 1). BLM has authority to conduct Mineral Assessment activities under section 1010 of the Alaska National Interest Land Claims Act (ANILCA).

In 1997, the first year of a multi-year mineral assessment project was undertaken to identify the number, type, amount, distribution, and development potential of mineral deposits located on Ahtna selected lands within the park boundary. There are 74 identified mineralized occurrences located within a 1-mile radius of the Ahtna selected lands with 55 occurrences occurring close enough to be considered important to this mineral assessment. Of those 55 occurrences, 9 were historically producing mines, 27 were development prospects, 12 were exploration prospects, and 7 were raw prospects. Historically producing mines within the selected areas include the Caribou Creek placer mine, the Nabesna, Royal Development Co., and Rambler Mines on the north side of the Wrangell Mountains and the Berg Creek, Clear Creek, Copper King, Mullen, and Silver Star Mines on the south side of the Wrangell Mountains. The majority (47) of the properties were lode deposits with the remainder (8) being placer deposits. During the 1997 field investigation 26 occurrences (8 in the northern Wrangell Mountains and 18 in the southern Wrangell Mountains) were located and sampled, 2 mines were visited but not sampled, 4 occurrences were not located but the surrounding area sampled, 17 occurrences were looked for but not located, and 7 occurrences were not looked for due to time and weather constraints.

LAND STATUS

Land status of the study area is under the jurisdiction of the NPS Wrangell-St. Elias National Park and Preserve. Located within the park are Ahtna Regional selected lands selected under the authority of the Alaska Native Claims Settlement Act (ANSCA), Section 12(c). Other native selections include village selections and native allotments. There are also numerous private inholdings and rights-of-way's occurring within the park boundary on both the north and south sides of the Wrangell Mountains.

Currently, there are no active mining claims located within the Ahtna selections. Six properties located within the selected areas have been patented and these include the Clear Creek Mine on Clear Creek, the Copper King Mine on Elliott Creek, the Mullen Mine on Copper Creek, the Nabesna and Royal Development Co. Mines (under one patent) at White Mountain, the War Eagle prospect on MacDougall Creek, and the Warner prospect on Rock Creek.

LOCATION AND ACCESS

The Wrangell-St. Elias National Park and Preserve is located in southcentral Alaska The park encompasses the Wrangell and Nutzotin Mountains to the north and the Chugach and St. Elias Mountains to the south (Figure 1). Park headquarters is located on the old Richardson Highway at Copper Center, Alaska

The area studied for this assessment included approximately 123,520 acres on the north side of the Wrangell Mountains and 321,280 acres on the south side for a total of 444,800 acres. Access to the study areas was along the Glenn Highway (Tok Cut-Off) and the Nabesna Road for the northern area and the Edgerton Highway for the southern area. All the highways are connected to the Richardson Highway and thus the Alaska Highway system.

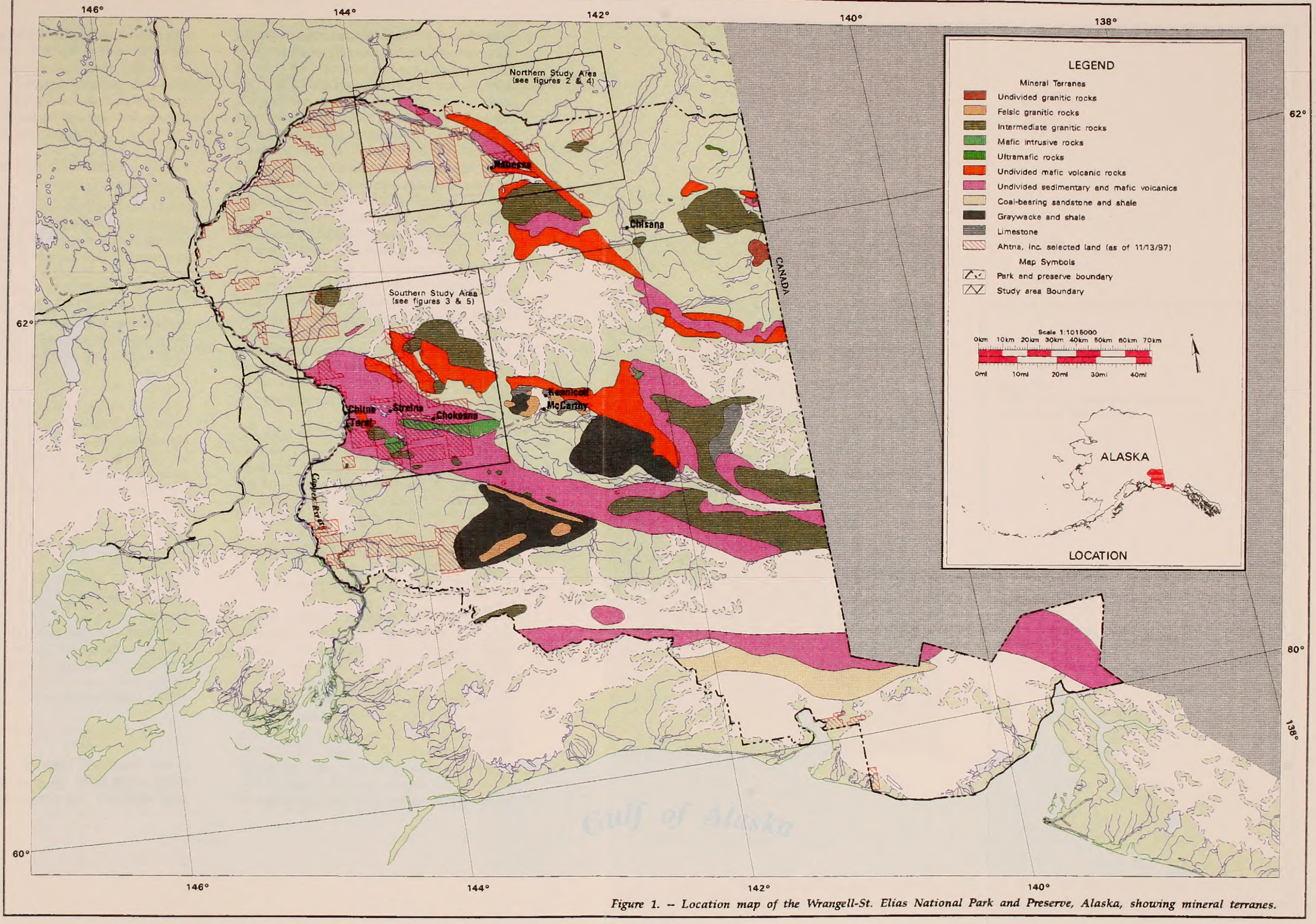


Figure 1. -- Location map of the Wrangell-St. Elias National Park and Preserve, Alaska, showing mineral terranes.

Transportation used to access the selections was via helicopter from either Devils Mountain Lodge for the northern area or from Kenny Lake for the southern area. Helicopter landing sites were located as close as possible to the sample location sites and as many mineral occurrences as possible were visited from each landing site.

ACKNOWLEDGMENTS

The authors would like to thank Danny Rosenkrans, Geologist, and Geoffrey T. Bleakley, Historian, Wrangell-St. Elias National Park and Preserve, Copper Center, Alaska; Logan Hovis, Historian, NPS Alaska Regional Office, Anchorage, Alaska; Don Richter, Geologist emeritus, USGS, Branch of Alaskan Geology, Anchorage, Alaska; John Devenport, Ahtna, Glennallen, Alaska; and Fritz Wohlwend, pilot, Trans-Alaska Helicopters, Inc., Anchorage, Alaska.

We would also like to thank Christie Ellis at the End of the Road Bed & Breakfast at Devils Mountain Lodge, Alaska and Susan Winingham at the Kenny Lake Mercantile as well as Patty and Kim Ryan at the Silver Fox Cafe, Kenny Lake, Alaska for all of their gracious hospitality and good cooking.

GEOLOGY

The study area includes two diverse physiographic terranes: the northern Wrangell Mountains area and the southern Wrangell Mountains area. Paleozoic and Mesozoic rocks in both areas are part of Wrangellia, a geologic accreted terrane that originated far to the south and has been tectonically rafted north to its present position (Richter, written communication, 1998).

Northern Wrangell Mountains area

The northern Wrangell Mountains area is characterized by low-lying, broad glacial valleys and steep mountainous terrain. The Denali Fault, an active dextral fault trending from the northwest to the southeast (Richter, etal, 1975b), separates the area into a northern half and a southern half. All mineral localities identified in the northern Wrangell Mountains area occur south of the Denali Fault. The oldest rocks in the area south of the Denali Fault belong to an ancient Pennsylvanian - Permian volcanic arc characterized by andesitic to dacitic lava flows and pyroclastic and volcaniclastic rocks. These rocks are overlain by Permian sedimentary rocks and Triassic tholeiitic lavas (Nikolai Greenstone) and limestones (Chitistone and Nizina Limestones). During the late Jurassic to Cretaceous another andesitic volcanic arc was active and was accompanied by the deposition of extensive marine sedimentary rocks Magmatism associated with the Jurassic/Cretaceous arc was responsible for the intrusion of numerous granitic plutons. Unconformably overlying all these older rocks are the widespread volcanic deposits (Wrangell Lava) of the Late Tertiary and Quaternary Wrangell volcanoes (Richter, written communication, 1998).

Surficial glacial deposits are present throughout the area as is active glaciation in the higher elevations. Mount Wrangell, a large shield volcano, periodically exhibits phreatic activity in its summit area. Mud volcanoes in the Copper River Basin, near the west flank of Mount Drum, erupt warm saline mud charged with carbon dioxide (Richter, written communication, 1998).

Southern Wrangell Mountains area

The southern Wrangell Mountains area is characterized by a low-lying, broad valley, the Chitina River Valley, that separate steep mountainous terrain of the southern Wrangell Mountains from that of the Chugach Mountains. The Border Ranges Fault, that transects the Chugach Mountains, forms the southern end of the study area. The area is underlain by rocks similar to those that occur in the northern Wrangell Mountains area. The oldest rocks belong to a Pennsylvanian - Permian volcanic arc, the Skolai arc which apparently developed an ancient oceanic

crust. The arc is overlain by thick sequences of Paleozoic and Mesozoic sedimentary rocks and both the arc and younger rocks have been intruded by Mesozoic and Cenozoic plutons and dikes. Late Tertiary Wrangell Lava unconformably overlies all older rocks The Triassic Nikolai Greenstone and the Chitistone Limestone, which locally host significant mineral deposits in the Wrangell Mountains, are present throughout much of the study area (Richter, written communication, 1998).

MINERAL DEPOSIT TYPES

Mineral deposit types, based on USGS "Mineral Deposit Models" by Cox and Singer (1986), located within the study area include: Carbonate-hosted Fe skarn, model 18d (copper, gold); Granitoid-hosted Au, models 22b and 26a (gold); Basaltic Cu (including Kennecott type), model 23 (copper); and Polymetallic vein, model 22c, (gold, silver, base metals)

Mineral resources in the northern Wrangell Mountains area include copper, gold, silver, and molybdenum. Copper, the most abundant mineral in the area, is found in porphyry copper, stockwork and contact metamorphic, vein and volcanogenic deposits. Gold and silver, the largest producers in the area, are found as byproducts of the copper porphyries, as well in contact metamorphic, disseminated, and stockwork deposits, and in placer deposits. Molybdenum occurs as a co-product of copper porphyries and as porphyry molybdenum deposits (Richter, etal, 1975a).

Mineral resources present in the southern Wrangell Mountains area include copper, gold, silver, molybdenum, antimony, and zinc. Copper, the most abundant resource in this area, is found in porphyry copper, stockwork and contact metamorphic, vein and volcanogenic deposits. Gold and silver are found as byproducts of the copper porphyries, as well as gold occurring in contact metamorphic, disseminated, and stockwork deposits, and in placer deposits. Molybdenum, antimony and zinc occur in smaller quantities as byproducts (MacKevett, etal, 1977)

HISTORY

Native copper from the region had been utilized by the indigenous residents of the lower Copper River for centuries. It was not only fashioned into hunting tools and ornamentation but also used as trading material with other Alaskan native groups Having this copper resource gave the Ahtna natives a lot of prestige and power which enhanced their position as traders between the natives to the south and those to the north. Most of the native copper was likely recovered from stream gravels, but evidence suggests that some may also have been mined from several outcrops throughout the valley (Bleakley, unpublished).

During the late eighteenth to the middle nineteenth centuries the Russians spent little effort in exploring the Copper River region for its mineral wealth. What little activity that did occur by Dmitri Tarkhanov in 1796, never reached as far north as the Chitina River (Bleakley, unpublished). Even after the United States purchased Alaska from the Russians in 1867, it wasn't until the early 1880's that the Americans really began exploring Alaska. Even then, the first mineral prospecting didn't occur until 1884 when John Bremner explored the lower Copper River (Bleakley, unpublished).

Serious exploration activity in the Wrangell Mountains began as a result of the influx of prospectors and miners during the 1898 Klondike "Gold Rush". This area was located along an alternate western route of the "Gold Rush Trail" between Port Valdez and the Yukon Territory. Numerous prospectors, weary from the adventure over the Tazlina Glacier, scoured the valleys and ridge tops of the Wrangell Mountains looking for their elusive "Mother Lode". Others, only stopped to check out the mineralization en route to the greater riches awaiting them at Whitehorse and beyond. A few successful prospectors began mining their deposits for gold, copper, and silver,

with the Nabesna and Kennecott Mines being the most notable successes. Less notable but important discoveries were made by Hubbard and Elliott on Elliott Creek, Ole Berg on Berg Creek, the Great Northern Development Co. on Clear Creek, and the prospects located on Copper Creek.

Most mining activity in the region had ceased by the mid to late 1930's either due to the ore being exhausted or from low mineral prices. During World War II mining activities in the United States that were deemed unnecessary for the war effort were closed down by executive order. A second flurry of mineral exploration occurred in the mid to late 1950's, but no real development or mining occurred during this period. Part of the reason was because the wages offered to the miners was less than what the government was paying construction workers throughout the state (verbal communication with Kirk Stanley). Though no mining has occurred at the Nabesna Mine since 1946, exploration and development activity has continued to occur on the Nabesna, Royal Development Co., and Rambler Mines as well as several other occurrences in the region during recent years. Exploration activity in the southern area has continued to occur on the smaller properties but none of the activity has taken place on Ahtna selections.

A detailed historical account of the copper and gold mining and exploration activities in the Wrangell Mountains, not associated with the Kennecott Mine, has been written in draft form by Geoffrey Bleakley, a Historian with the Wrangell-St. Elias National Park and Preserve (Bleakley, unpublished).

PREVIOUS STUDIES

The Wrangell Mountains were first explored for their mineral potential by the U.S. War Department in 1885. Lt. Henry T. Allen reached the headwaters of the Chitina and Nizina Rivers looking for the source of Chief Nikolai's copper (Allen, 1887). In 1891, Charles W. Hayes was the first USGS geologist to explore and discover many of the copper deposits in the area (Hayes, 1892). Rohn (1900) conducted the first true geologic and mapping exploration program of the area for the War Department in 1899 The USGS began earnestly conducting studies and reporting on the geology and mining activities of the Wrangell Mountains area beginning in 1898 (Brooks, 1898 and Capps, 1915). Detailed Alaska Mineral Resource Assessment Program (AMRAP) studies, headed by Richter and MacKevett of the USGS, have been conducted on the Nabesna, McCarthy, and Valdez quadrangles. These studies include the publication of geochemistry data, mineral resource data, and geologic maps. See the bibliography section for a listing of those reports. The USBM conducted a 2 year reconnaissance mineral assessment of the southern Wrangell-St. Elias area in 1977 and 1978 (U.S. Bureau of Mines, 1978). Only 3 of the occurrences visited were located within Ahtna selected lands. None of the analytical records have been located for those samples collected during that study.

PRESENT STUDY

A literature search conducted by the Anchorage Mineral Resources Team (AMRT) identified 73 mineral occurrences located in or within a 1-mile radius of the Ahtna selections. All of the occurrences were located within the McCarthy, Nabesna, and Valdez quadrangles. Nine of these occurrences were historically producing mines Of these prospects, 55 were identified as sites needing field examinations due to their location within or close proximity to the Ahtna selections. Most (46) were hard rock gold, copper, and silver occurrences with 8 of them being placer gold or platinum occurrences.

This study was broken down into 2 areas, the northern Wrangell Mountains area and the southern Wrangell Mountains area. This made it easier to conduct the field work and present the results of this study. During 1997, field work was performed during 2 separate periods. Work in the

northern area was conducted from June 15 through 28 based out of the End of the Road Bed & Breakfast, Devils Mountain Lodge, Alaska. Work in the southern area was based out of Kenny Lake Mercantile, Kenny Lake, Alaska from July 20 through August 1.

The northern area includes the north flank of the Mentasta Mountains and the north side of the Wrangell Mountains from Camp Creek northwest to Caribou Creek (Figure 2). This area includes the Nabesna and the Rambler Mines. Even though these mines are located within Ahtna selections the Nabesna and Royal Development Co. Mines are patented and the Rambler Mine is having a validity examination conducted on it by the NPS.

The southern area covers the south side of the Wrangell Mountains and includes the Chitina area, from Nelson Mountain northwest to the Kotsina and Kuskulana River headwaters (Figure 3). This area includes occurrences in the Kluvesna and Kotsina River drainages that were discovered and worked during the early 1900's concurrent with the Kennecott Mine operation. The major producing operations in the southern area included the Copper King Mine on Elliott Creek, the Great Northern Development Co. Clear Creek Mine on Clear Creek, the Mullen Mine on Copper Creek, the Berg Creek Mine, and the Silver Star Mine on the Kluvesna River.

Field work consisted of locating as many of the workings as possible on-the-ground. When workings were located and accessible, site location and elevation data were collected using a Trimble Navigation Pathfinder Series Asset Surveyor GIS/GPS system[1]. A representative rock or placer sample was then collected from the site to determine the mineral type and content of the material mined. If an adit was located and open, a cursory mapping program was conducted This consisted of determining the length and direction of any drifts or crosscuts found. Any unusual findings, such as the location and amount of dynamite or associated building structures, were also noted.

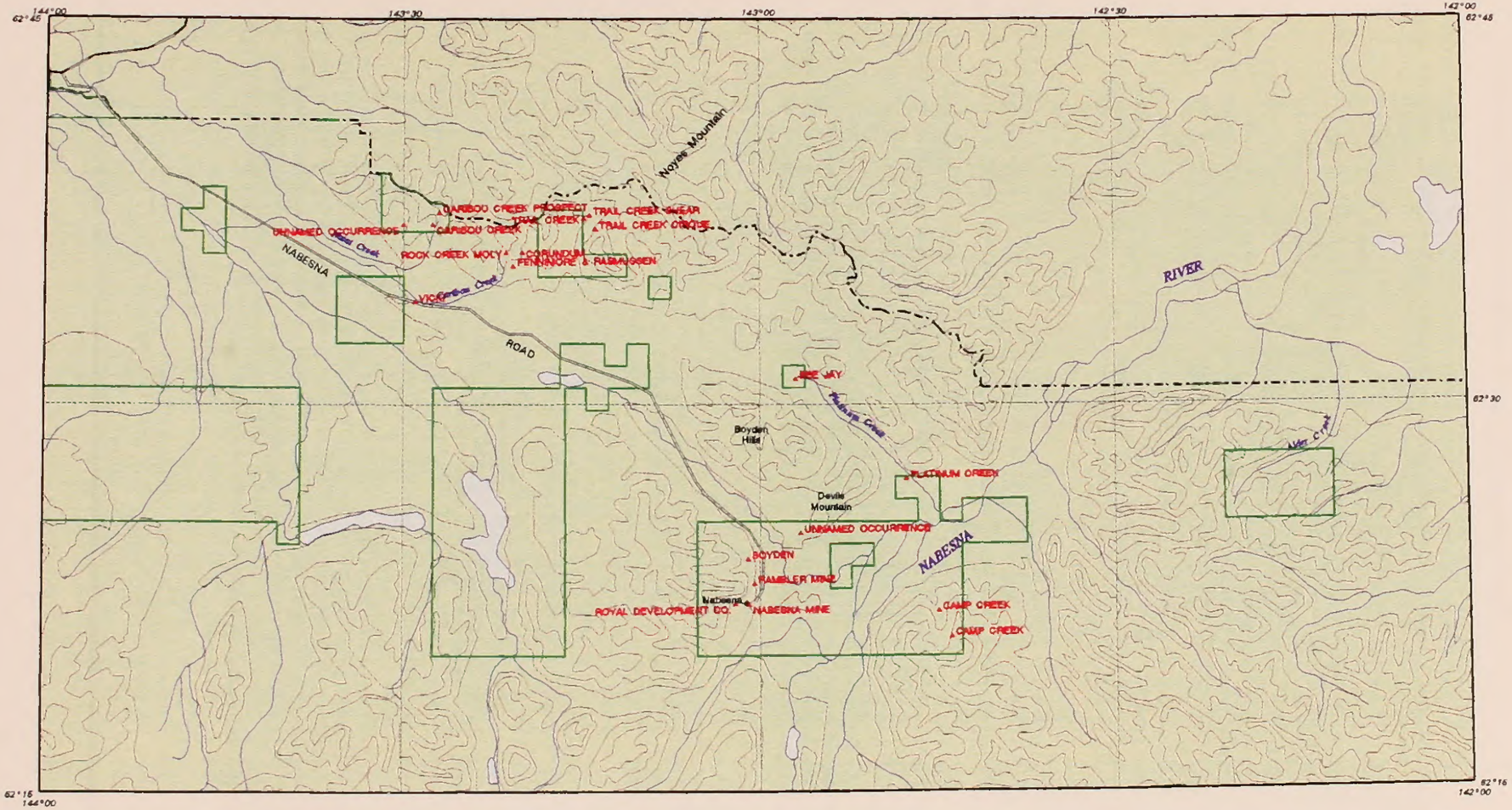
Once the field work was completed the information gathered on-the-ground was combined with the information from the literature search. A more comprehensive understanding was developed as to what workings were associated with what company and/or persons. Property summary sheets (listed in Appendix B) were created for each occurrence. Occurrences requiring more detailed work were identified and the 1998 field season was planned. No verification of the on-the-ground workings with the literature had been completed before this report.

SAMPLING

Sampling consisted of both hard rock and placer sampling techniques. Hard rock samples included collecting representative hand specimens and analytical samples of the mineralization and host rock encountered. All hard rock samples consisted of either grab or rock chip samples collected on the surface or underground. Sample sizes ranged from 3 to 10 pounds depending upon the quality and quantity of mineralization encountered. Placer samples consisted of running 0 10 cubic yard of gravel through a portable sluice box and panning down the concentrates to an approximate ½ pound sample size Each mine, prospect, or occurrence could have from 1 to 4 individual samples collected depending upon the extent of the mineralization.

All hard rock samples were sent to ITS Intertek Testing Services Bondar-Clegg[1], North Vancouver, B.C., Canada, analytical laboratory for preparation and 34 element ICP analysis and FA/AA analysis for those samples over the

[1]Mention of a specific brand name or manufacturer is for information purposes only and does not imply endorsement by the Bureau of Land Management.



LOCATION

LEGEND

- Property location
- Town / village
- Rivers
- Ahtna, Inc. selected lands (as of 11/13/87)
- Park and preserve boundary

Scale 1:250000
0km 10km
0mi 10mi
Contour interval 1000 feet

Figure 2. – Property location map of the Northern Study Area Wrangell-St. Elias National Park and Preserve.

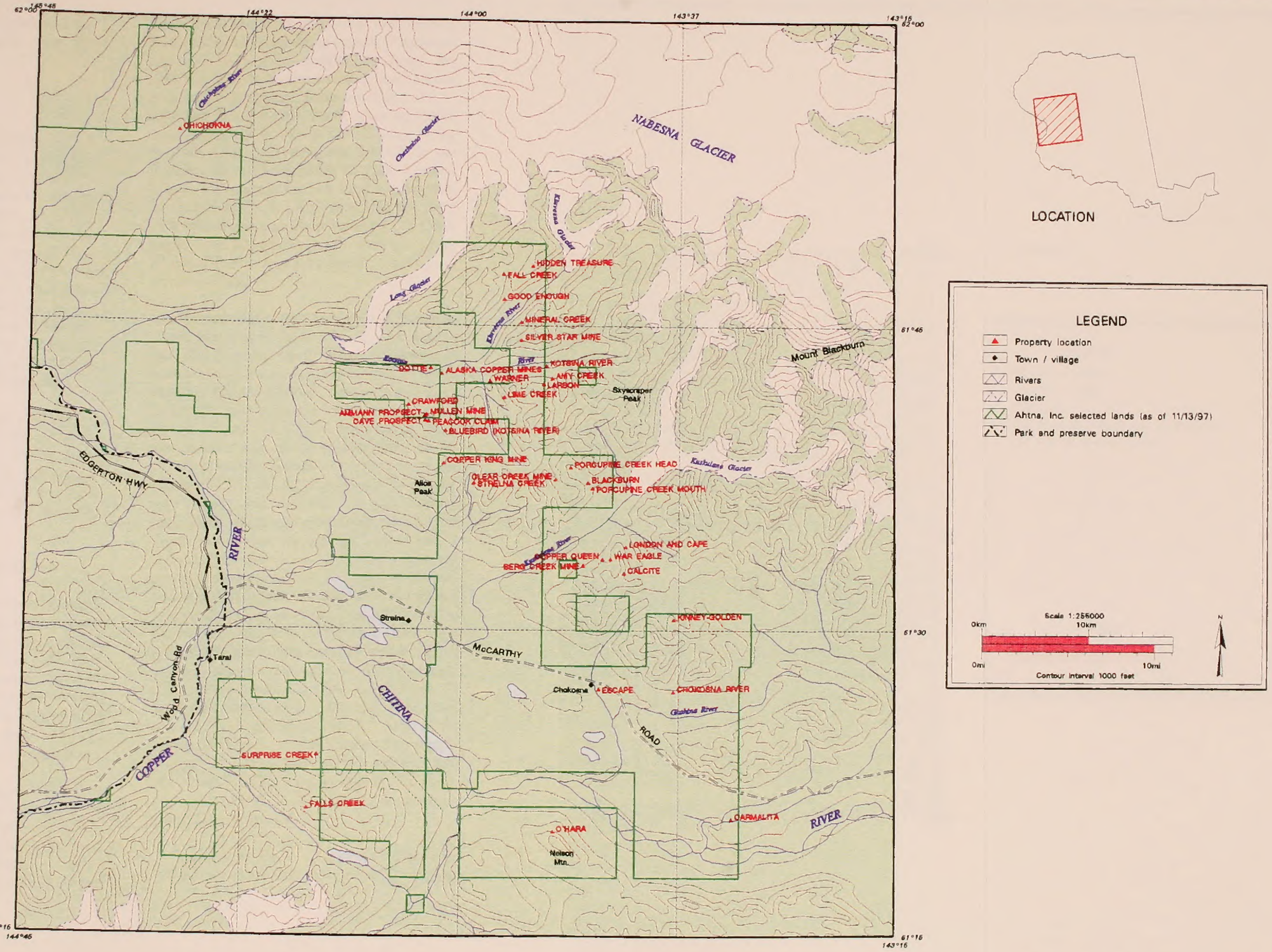


Figure 3. – Property location map of the Southern Study Area Wrangell-St. Elias National Park and Preserve.

detection limits. Placer sample concentrates, due to their low amount of free gold, were also submitted for analysis.

RESULTS

On site investigations were completed on 26 of the identified mineral occurrences (8 in the northern area and 18 in the southern area). A total of 37 adits were located (Table 1) and 68 samples collected and analyzed (Appendix A). Four samples contained over 16% copper (the Bluebird prospect 50.15%, the Mullen Mine open cut 34.46 and 36.64%, and the Cave prospect 16.15%), 11 samples contained between 1.2 and 13.4% copper, 3 samples contained between 316.2 and 1,677.1 ppm Ag, 2 samples contained over 2,000 ppm antimony, 7 samples contained over 10% iron, 3 samples contained between 1,208 and 3,956 ppm zinc, and 1 sample contained 1,960 ppm lead.

See Figures 4 and 5 for the sample locations and Appendix A for the analytical results of all the samples collected during this study. Figures 2 and 3 show the property locations and Appendix B contains property summary sheets for each mine, prospect, or occurrence located within the study area.

Northern Wrangell Mountains area

During the investigation of the northern Wrangell Mountains 5 adits on 3 hard rock properties along with 2 placer occurrences (Table 1) were examined and 11 samples were collected from not these locations (Figure 4). Four occurrences were located and 4 were not looked for due to time constraints (Table 2). A total of 31 samples were collected from the Camp, Caribou, Rock, and Trail Creek areas as well as the White Mountain area.

Bedrock in the northern Wrangell Mountains, consisting mainly of basalts and limestones, is extremely incompetent and highly fractured. Discovering any workings was entirely by luck. Investigators found it very difficult to locate existing mine workings. Tailings and mine waste dumps in this area are small and tend to blend in to the natural surroundings (scree slopes). Vegetative regrowth was not a contributing factor for identification in the higher elevations and too thick in the lower elevations to make any disturbed area stand out. There is little, if any, left-over mine or camp equipment at any of the workings in the northern area other than that located at the Nabesna, Royal Development Co., and Rambler Mines. One cairn in Caribou Creek was spotted, on an over flight, and used as a reference point while several aluminum claim posts on Rock Creek helped direct us to the open adit. Noting a rusted 20 gallon drum in a ravine assisted in locating the actual workings.

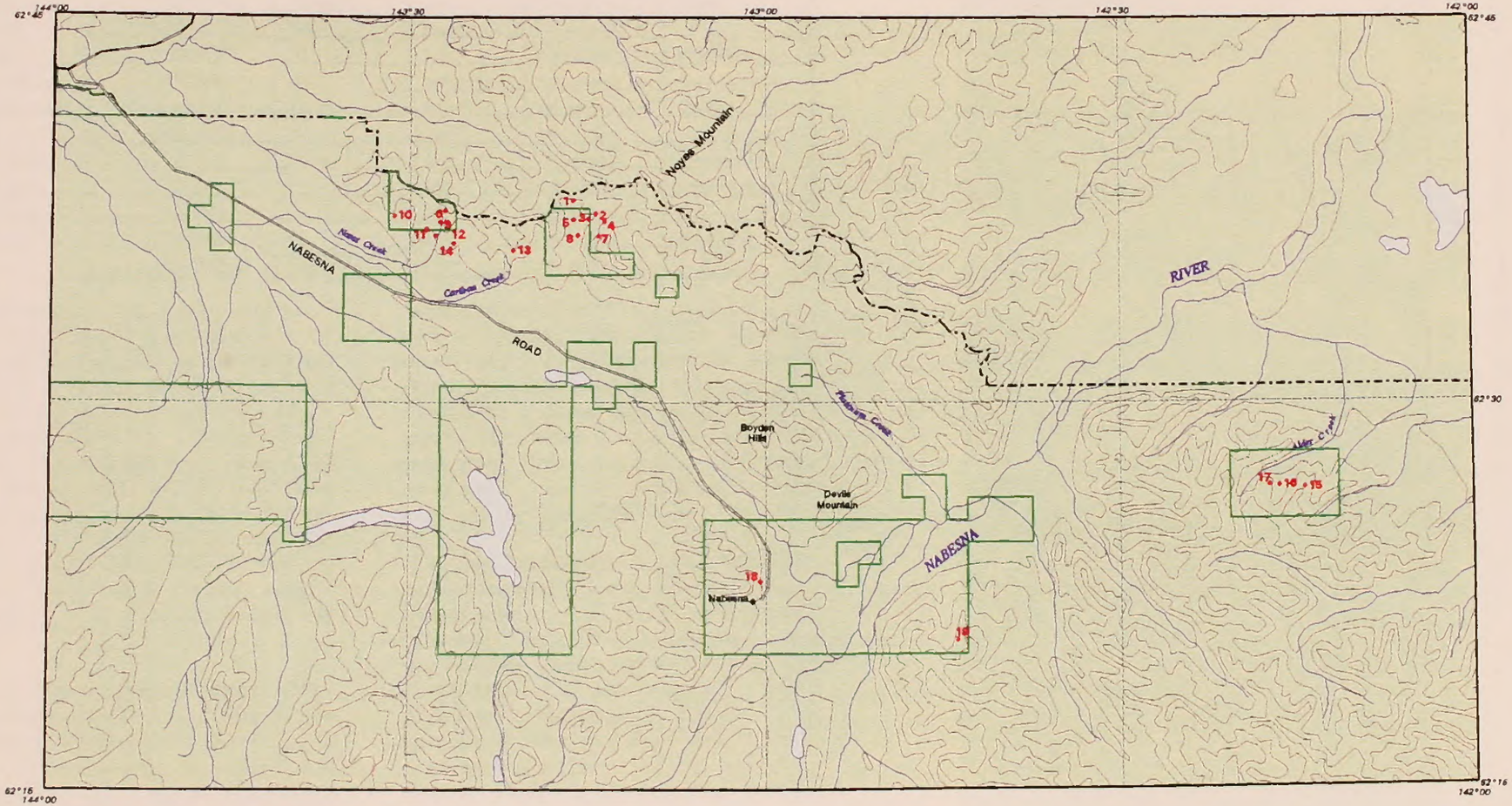
Two caved adits of the Caribou Creek Prospect, on the west side of Caribou Creek, were located and the Caribou Creek Mine, an historical hydraulic placer operation, lower down the creek was identified and sampled. Three samples (map no.6) collected at the Caribou Creek Prospect contained from 2 to 137 ppm copper and up to 0.3 ppm silver. Two placer samples (map no. 9) collected from the Caribou Creek Mine workings contained 2,951 and 5,227 ppb gold, 0.6 and 0 4 ppm silver, and 31 and 33 ppm copper, respectively. A reported placer operation on Trail Creek was looked for but not located and 2 samples (map nos. 1 and 8) collected from the stream drainage contained 4,321 and 1,144 ppb gold, less than 0.2 and 0.2 ppm silver, and 69 and 68 ppm copper, respectively. An adit driven by Kennecott Copper Corp. on the Rock Creek Moly prospect was located and found to be open Three samples (map no. 13) collected from the waste dump contained from 3 to 4 ppm molybdenum, 13 to 81 ppm copper, up to 1,180 ppm manganese, and up to 13 ppb gold. The 2 adits at the Rambler Miner were also located. One sample (map no. 18) collected from the vein above the adit contained 3,301 ppm copper, 103.3 ppm silver, 8.68 ppm gold, 3,956 ppm zinc, 1,960 ppm lead, and 1,238 ppm bismuth.

Trail Creek Shear, an extensive shear-zone located on a eastern tributary of Trail Creek, was

TABLE 1. - Adit locations in the Wrangell-St. Elias National Park and Preserve.

Property name	Latitude	Longitude	Elev (ft.)	Bearing	Depth (ft.)	Sample no(s).	Accessibility
Ammann Prospect lower	N 61°40'33.607"	W 144°04'02.997"	3,860	N88°E	N/A	10041	Adit caved
Ammann Prospect upper	N 61°40'32.198"	W 144°04'04.876"	3,940	S52°E	10	Not sampled	Portal open
Amy Creek - Tunnel 6	N 61°42'25.017"	W 143°50'50.725"	3,810	N70°E	N/A	10048	Adit caved
Amy Creek - Tunnel 7	N 61°42'22.275"	W 143°50'35.386"	3,880	N88°E	N/A	10049	Adit caved
Amy Creek - Tunnel 8	N 61°42'11.105"	W 143°50'38.788"	4,200	S35°E	50+	10050	Portal open, filled with water
Berg Creek Mine Tunnel 5	N 61°33'09.332"	W 143°47'19.801"	2,825	N/A	N/A	10059-10060	Adit caved
Bluebird	N 61°39'49.261"	W 144°01'54.261"	5,010	N/A	N/A	10045	Adit caved
Calcite	N 61°32'48.777"	W 143°43'13.397"	5,020	S42°E	72	10068	Portal open, sloughed @ 29 ft.
Caribou Creek Prospect	N 62°37'28.137"	W 143°26'59.860"	4,920	N18°W	N/A	10006-10008	Adit caved
Caribou Creek Prospect	N 62°37'26.995"	W 143°27'02.084"	4,890	N48°E	N/A	Not sampled	Adit caved
Cave Prospect	N 61°40'18.381"	W 144°04'02.402"	4,110	N25°E	34	10043	Portal open to 43 ft., flooded
Clear Creek Mine Tunnel 1	N 61°37'24.608"	W 143°50'24.448"	5,010	S85°E	150-200	10054	Portal open partially sloughed
Clear Creek Mine Tunnel 2	N 61°37'50.057"	W 143°50'50.595"	5,440	S87°E	N/A	10056-10057	Adit caved
Clear Creek Mine Tunnel 3	N 61°37'41.604"	W 143°50'57.967"	5,140	N90°E	20	Not sampled	Portal open, caved @ 20 ft.
Clear Creek Mine Tunnel 4	N 61°36'58.588"	W 143°50'22.623"	4,300	N90°E	N/A	Not sampled	Adit caved
Copper King Mine	N 61°38'12.130"	W 144°02'03.251"	4,700	S88°E	N/A	10063	Portal iced and snowed in
Copper Queen	N 61°33'31.285"	W 143°45'27.753"	3,340	N/A	N/A	10062	Adit caved
Fall Creek - Homestake	N 61°47'31.899"	W 143°56'03.964"	4,640	S75°E	83	10038	Portal open, x-cuts @ 40 ft. & 55 ft.
Fall Creek - Newhome	N 61°47'29.965"	W 143°55'50.555"	4,540	N70°E	35	10037	Portal open
Falls Creek No. 1	N 61°21'13.668"	W 144°15'38.732"	4,780	S80°E	150	10064	Open, N88°E @ 29 ft, x-cut @ 65 ft.
Falls Creek No. 2	N/A	N/A	4,580	N/A	N/A	Not sampled	Portal open, length unknown
Falls Creek No. 3	N 61°21'30.147"	W 144°15'40.455"	4,710	N20°E	10	Not sampled	Portal open
Larson East	*N 61°42'07.680"	*W 143°52'38.700"	4,800	N5°W	90	10051	Portal open, dynamite
Larson West	*N 61°42'08.461"	*W 143°51'46.415"	5,000	N/A	N/A	Not sampled	Adit caved (GPS from helicopter)
London and Cape	*N 61°34'07"	*W 143°43'04"	4,500	N/A	N/A	Not sampled	Adit caved
Mullen Mine No. 1	N 61°40'34.613"	W 144°03'53.492"	3,700	S72°E	150-200	10040	Portal open, x-cut at 50 ft., dynamite
Mullen Mine No. 2	N 61°40'32.601"	W 144°03'52.244"	3,580	N32°E	N/A	Not sampled	Adit caved
Mullen Mine No. 3	N 61°40'35.035"	W 144°03'53.335"	3,670	N68°E	10	Not sampled	Portal open
Mullen Mine No. 4	N 61°40'35.547"	W 144°03'53.421"	3,690	N68°E	27	Not sampled	Portal open
Peacock Claim	N 61°40'14.790"	W 144°03'39.530"	4,120	N2°E	33	10042	Portal open to 33 ft., caved in
Rambler Mine	N 62°23'03.577"	W 143°00'29.438"	3,640	N/A	N/A	10027	Portal open, iced in @ 20 ft.
Rambler Mine	N 62°23'07.028"	W 143°00'19.522"	3,400	N/A	N/A	Not sampled	Portal open, iced in @ 60 ft.
Rock Creek Moly	N 62°35'54.617"	W 143°21'20.739"	5,170	N48°E	150+	10016-10018	Portal open, partially sloughed
Silver Star Mine	N 61°44'18.825"	W 143°54'06.899"	5,100	N15°W	50	10035	Portal open
Silver Star Mine	N 61°44'17.936"	W 143°54'09.497"	5,010	N/A	N/A	10036	Portal sloughed in
War Eagle	N 61°33'32.068"	W 143°44'36.985"	3,550	N48°E	N/A	10064	Adit caved

* GPS coordinates could not be differentially corrected for this location. N/A Not available.



LOCATION

LEGEND

- Sample location
- Town / village
- Rivers
- Ahtna, Inc. selected lands (as of 11/13/87)
- Park and preserve boundary

Scale 1:255000
0km 10km
0mi 10mi
Contour interval 1000 feet

Figure 4. – Sample location map of the Northern Study Area Wrangell-St. Elias National Park and Preserve.

TABLE 2. - Mineral localities in the Nabesna Quadrangle.

Location name	BAM seq. no.	Commodity	Deposit type	Mine type	BLM status/1997
Bee Jay	0020780078	Cu, Ag, Au, Pb	Lode	Raw prospect	
Boyden	0020780101	Au	Placer	Exp. prospect	Not located
Camp Creek	0020780011	Cu	Lode	Exp. prospect	Area sampled
Camp Creek	0020780077	Cu	Lode	Raw prospect	Area sampled
Caribou Creek Mine	0020780132	Au	Placer	Past producer	Located/sampled
Caribou Creek Prospect	0020780003	Au, Pb, Zn	Lode	Dev. prospect	Located/sampled
Corundum	0020780083	Corundum	Lode	Exp. prospect	Not located
Fennimore & Rasmussen	0020780111	Cu	Lode	Raw prospect	Not located
Nabesna Mine	0020780010	Au, Ag, Cu	Lode	Past producer	Visited
Platinum Creek	0020780129	PGM	Placer	Raw prospect	
Rambler Mine	0020780036	Au	Lode	Past producer	Located/sampled
Rock Creek Moly	0020780004	Mo	Lode	Dev. prospect	Located/sampled
Royal Development Co.	0020780009	Au, Cu	Lode	Past producer	Visited
Trail Creek	0020780052	Au	Placer	Raw prospect	Located/sampled
Trail Creek Cirque	0020780009	Pb, Ag	Lode	Raw prospect	Area sampled
Trail Creek Shear	0020780133	Cu	Lode	Raw prospect	Located/sampled
Unnamed occurrence	0020780008	Cu	Lode	Raw prospect	
Unnamed occurrence	0020780081	Au	Lode	Dev. prospect	Not located
Vicki	0020780080	Au	Placer	Exp prospect	

located and sampled Four samples (map no. 2) contained from 21 to 135 ppm copper, up to 80 ppb gold, up to 0.5 ppm silver, and 1,177 to 3,457 ppm manganese. Massive pyrite float located in the Trail Creek Cirque vicinity was collected (map no. 4) and contained from 42 to 1,037 ppm copper, respectively, up to 0.9 ppm silver, and up to 17 ppb gold. Massive pyrite float located in the Camp Creek drainage was sampled (map no 19) and contained 107 ppm copper, 0.3 ppm silver, and 1,209 ppm bismuth. Neither of the float sources were located because of the extremely unstable slope conditions in the Trail and Camp Creek drainages.

There is an extensive east-west trending, shear-zone extending from beyond Jack Creek through Caribou Creek. This shear zone follows a major fault zone, shows intensive iron-staining, and ranges up to 140 feet wide. Mineralization consists of disseminated pyrite and minor chalcopyrite. Five samples (map nos. 10, 11, 12, and 14) collected from the stain zones contained only 3 to 58 ppm copper, 217 to 1,054 ppm manganese, and up to 11 ppb gold. Numerous shear zones of a similar nature occur throughout the northern Wrangell Mountains area. None of the shear zones encountered contained high enough quality or quantity of mineralization to warrant any further exploration. This reconnaissance validated the reason why there was only isolated mining activity in the northern Wrangell Mountains.

The Rambler Mine, due to its questionable land status, is currently under investigation for validity and selectability by the NPS Regional Office in Anchorage, Alaska. Thus, no investigation other than collecting a representative chip sample (map no. 18) for analysis was completed by the Bureau for this report. The sample was collected from an open cut above the upper adit and contained 3,301 ppm copper, 103.3 ppm silver, 8.68 ppm gold, 3,956 ppm zinc, 1,960 ppm lead, and 1,238 ppm bismuth.

The Nabesna and Royal Development Co Mines

are patented and the current owner requested that no samples be taken from the property, thus was not a part of this mineral assessment

Southern Wrangell Mountains area

During the investigation of the southern Wrangell Mountains area 32 adits (Table 1) on 18 properties were located (Figure 3) and 30 samples collected. Sixteen other occurrences were looked for but not located and 3 occurrences were not looked for due to time and weather constraints (Tables 3 and 4). A total of 36 samples were collected from the Chichokna, Chokosna, Kotsina, (Figure 5). Bedrock in the southern Wrangell Mountains, consisting mainly of volcanic flows and limestones, is much more competent than the northern area rock, though, still highly fractured, sheared, and faulted. Identifying workings was much easier as the waste dump piles tended to be finer grained and a lighter color than the talus.

Also more mining activity was conducted in this region than the north so there were more adits to locate. Several over flights were necessary, however, to find the workings. Vegetative regrowth as well as the trails leading to the workings was more of a contributing factor in identification of workings in the higher

TABLE 3. - Mineral localities in the McCarthy Quadrangle.

Location name	BAM seq. no.	Commodity	Deposit type	Mine type	BLM status - 1997
Amy Creek	0020870058	Cu	Lode	Dev. prospect	Located/sampled
Berg Creek Mine	0020870073	Au, Ag, Cu	Lode	Past producer	Located/sampled
Blackburn	0020870064	Cu, Au	Lode	Dev. prospect	Not located
Calcite	0020870077	Cu, Fe	Lode	Dev. prospect	Located/sampled
Carmalita	0020870138	Au	Placer	Exp. prospect	
Chokosna River	0020870144	Cu	Lode	Exp. prospect	Not located
Clear Creek Mine	0020870063	Cu	Lode	Past producer	Located/sampled
Copper Queen	0020870070	Cu, Fe	Lode	Dev. prospect	Located/sampled
Escape	0020870074	Au	Placer	Exp. prospect	
Fall Creek	0020870015	Cu, Au, Ag	Lode	Dev. prospect	Located/sampled
Good Enough	0020870046	Cu, Ag	Lode	Dev. prospect	Not located
Hidden Treasure	0020870030	Cu, Au, Ag	Lode	Dev. prospect	Located/sampled
Kinney-Golden	0020870074	Cu	Lode	Dev. prospect	Not located
Kotsina River	0020870052	Cu	Lode	Dev. prospect	Not located
Larson	0020870056	Cu	Lode	Dev. prospect	Located/sampled
Lime Creek	0020870080	Cu	Lode	Dev. prospect	Not located
London and Cape	0020870090	Cu, Mo, Ag	Lode	Dev. prospect	Located/not sampled
Mineral Creek	0020870048	Cu, Au, Ag	Lode	Dev. prospect	Not located
O'Hara	0020870042	Pb, Zn, Fe	Lode	Dev. prospect	Located/not sampled
Porcupine Creek Head	0020870041	Cu, Au	Lode	Dev. prospect	Not located
Porcupine Creek Mouth	0020870056	Cu, Ag	Lode	Dev. prospect	Not located
Silver Star Mine	0020870049	Au, Cu, Bi	Lode	Past producer	Located/sampled
Strelna Creek	0020870062	Cu	Lode	Exp. prospect	Not located
War Eagle	0020870057	Cu, Fe	Lode	Dev. prospect	Located/sampled
Warner	0020870055	Cu	Lode	Dev prospect	Not located

TABLE 4. - Mineral localities in the Valdez Quadrangle.

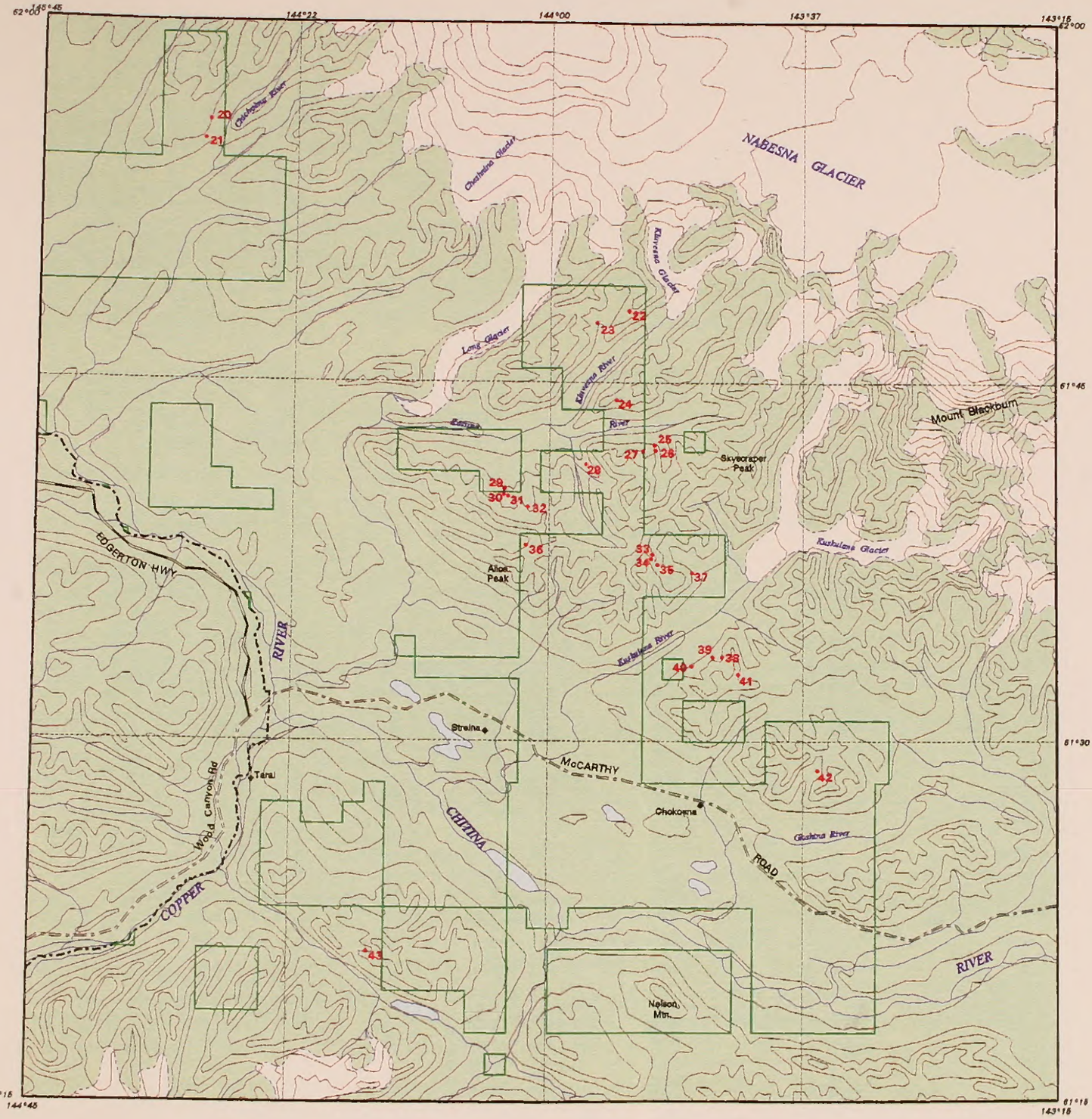
Location name	BAM seq. no.	Commodity	Deposit type	Mine type	BLM status - 1997
Alaska Copper Mines	0020860128	Cu	Lode	Exp. prospect	Not located
Ammann Prospect	0020860194	Cu, Ag	Lode	Dev. prospect	Located/sampled
Bluebird	0020860139	Cu, Au	Lode	Dev. prospect	Located/sampled
Cave Prospect	0020860192	Cu, Ag	Lode	Dev. prospect	Located/sampled
Chichokna	0020860087	Au	Lode	Exp. prospect	Area sampled
Copper King Mine	0020860140	Au, Cu	Lode	Past producer	Located/sampled
Crawford	0020860125	Uranium	Lode	Exp. prospect	Not located
Dottie	0020860127	Au	Placer	Exp. prospect	
Falls Creek	0020860105	Cu	Lode	Dev. prospect	Located/sampled
Mullen Mine	0020860126	Cu, Ag	Lode	Past producer	Located/sampled
Peacock Claim	0020860193	Cu, Ag	Lode	Dev. prospect	Located/sampled
Surprise Creek	0020860191	Cu	Lode	Dev prospect	Not located

elevations. The vegetation in the lower elevations was too thick to make any disturbed area stand out. Very little if any equipment was left at any of the properties; mostly old forges, drill steel, an occasional ore car (both wood and metal), and often rails extruding from the portals. One adit contained well over 1,000 candles scattered throughout the workings and staked in boxes in the back of the adit. Two old mill buildings were located, the Nugget Creek Millsite located just outside the selected area and the North Midas Millsite on Berg Creek, but both had been stripped of any equipment and were deteriorating rapidly. Numerous old collapsed buildings or old foundations helped identify areas containing workings.

Two major drainage basins contained the greatest amount of mineral activity in this part of the study area: they were the Kotsina River including the Kluvesna River and the Kuskulana River. Other areas of mineral activity included Elliott Creek (a southern tributary of the Kotsina River) and Canyon Creek (a tributary of the Copper River) south of Chitina. Adits and workings located and sampled in the Kluvesna River drainage included Fall Creek and the Hidden Treasure prospects. The Kotsina River drainage included the Copper Creek workings of the Mullen Mine, the Cave Prospect, the Peacock Claim, the Ammann Prospect, and the Bluebird prospect. Amy Creek workings including the Amy Creek adits and the Larson East and West adits. The Silver Star Mine workings were also located in the Kotsina River drainage.

The Kuskulana River drainage included the Clear Creek Mine workings on Clear Creek; Berg Creek contained workings of the Copper Queen and the Berg Creek Mine; MacDougall Creek contained workings of the Calcite prospect and the War Eagle prospect; and the workings of the London and Cape prospect located on Trail Creek. Workings on Elliott Creek included the Copper King Mine and the Canyon Creek workings of the Falls Creek prospect.

Fall Creek contained 2 adits, the Homestake and Newhome. The Homestake adit, driven S. 75° E. for 83 ft. into a zone of basaltic tuff, contained malachite-stained native copper, bornite, and chalcopyrite. The mineralized zone covered an area 50 ft. high by 100 ft. wide. Analytical results from a grab sample (map no. 23) contained 2.9% copper and 8.5 ppm silver. The Newhome adit, driven N. 70° E. for 35 ft., contained malachite- and azurite-stained quartz and bornite. A grab sample (map no. 23) from the waste dump contained 5,354 ppm copper and 7.4 ppm silver.



LEGEND

- Sample location
- Town / village
- Rivers
- Glacier
- Ahtna, Inc. selected lands (as of 11/13/97)
- Park and preserve boundary

Scale 1:255000
0km 10km
0mi 10mi
Contour interval 1000 feet

Figure 5. – Sample location map of the Southern Study Area Wrangell-St. Elias National Park and Preserve.

The Hidden Treasure consisted of an opencut in malachite-stained vesicular basalt containing bornite. A grab sample (map no. 22) from the waste dump contained 3.3% copper and 3.0 ppm silver. A second opencut was located but no visible mineralization was found.

Workings in Copper Creek include the Mullen Mine Nos. 1-4 adits and an open cut. The Mullen No. 1 adit, driven S. 72° E. along a shear zone contained quartz and chalcopyrite. An inclined shaft is located north of the adit at the portal. Two collapsed buildings are located in front of the portal. A sample (map no. 29) collected from the shear zone contained 12.2% copper, 23.6 ppm silver, and 286.1 ppm cadmium. No visible mineralization was noted at the Nos. 2, 3, or 4 adits. An open cut above the No. 2 Adit, cut into the malachite- and azurite-stained bedrock face, contained massive chalcopyrite. A chip sample (map no. 29) taken across the face contained 34.46% copper and 40.5 ppm silver. A "High Grade" grab sample (map no. 29) contained 36.64% copper and 109.7 ppm silver.

The Cave Prospect adit, driven N. 25° E. was open for 34 ft. and contained a malachite- and azurite-stained quartz vein with chalcopyrite. A sample (map no. 30) of the mineralized vein contained 16.95% copper and 30.6 ppm silver. The Peacock Claim adit, driven N. 2° E. was caved at 34 ft. A sample (map no. 31) taken out of greenstone rock wall contained 3.1% copper and 4.8 ppm silver. The Ammann Prospect upper adit, driven S. 52° E. for 19 ft., contained 2-in.-wide calcite veins. No visible mineralization was noted at this adit. The lower adit was caved. Bedrock consisted of malachite- and azurite-stained limestone with 3/4 in. calcite veins and chalcopyrite and pyrite. A grab sample (map no. 29) from the waste dump contained 1.2% copper and 6.4 ppm silver. The Bluebird prospect consisted of an opencut or caved adit along a highly sheared malachite- and azurite-stained zone. Mineralization consisted of massive chalcocite, A "High Grade" sample collected from the waste dump (map no. 29) contained 50.15% copper and 103.6 ppm silver. The shear zone outcrops below the workings contained chalcopyrite. A chip sample (map no. 32) from the outcrop contained 6.4% copper and 10.3 ppm silver.

Amy Creek had evidence of several past mining operations. The Amy Creek prospect had 3 adits; the main adit Tunnel 6 was caved, appeared to be driven N. 70° E. into highly sheared and iron-stained basalt. Mineralization consisted of disseminated pyrite and minor chalcopyrite. A sample (map no. 25) from the waste dump contained only 183 ppm copper and a trace of silver. Across the valley, Tunnel 7 was also caved and appeared to be driven N. 88° E. into the sheared and iron-stained basalt. A sample (map no. 25) collected from the waste dump contained only 244 ppm copper and 0.3 ppm silver. Tunnel 8 was located further upstream. The adit was driven S. 35° E. at least 50 ft., into the sheared and iron-stained basalt. Mineralization consisted of disseminated and veinlets of pyrite and chalcopyrite. A sample (map no. 26) collected from the waste dump contained 211 ppm copper and a trace of silver. Other Amy Creek workings include the Larson East and West adits. The Larson East adit was driven N. 5° W. for 90 ft., in iron-stained basalt containing disseminated pyrite. A sample (map no. 27) collected from the waste dump contained 188 ppm copper and a trace of silver. The Larson West adit was not accessible.

The Silver Star Mine located on Finnestad Creek, a northern tributary of the Kotsina River, was the last operating mine in the area, closing down in the late 1980's. The property contains 2 adits and numerous opencuts and stripping. The upper adit was driven N. 15° W. for 50 ft. through sheared iron-stained basalts, along a 6-in.-wide shear zone. Mineralization consisted of malachite- and azurite-stained bornite, chalcopyrite, and arsenopyrite. A sample (map no. 24) collected from the waste dump contained 2.6% copper, 1,677.1 ppm silver, over 2,000 ppm antimony, 3,060 ppm zinc, 158 ppm lead, and 177 ppb gold. The lower adit was caved at the portal but with a little work could be reopened. Mineralization consisted of bornite and chalcopyrite in a quartz and calcite matrix. A sample (map no. 24) collected outside the portal

contained only 513 ppm copper and 31.2 ppm silver. An ore stockpile next to an opencut contained quartz and calcite veinlets and blebs of bornite, chalcopyrite, arsenopyrite, and galena. A grab sample (map no. 24) contained 5,811 ppm copper, 618.4 ppm silver, over 2,000 ppm antimony, 989 ppm zinc, and 404 ppm lead.

Mine workings looked at in the Kuskulana River drainage included those operations on Clear Creek, Berg Creek, MacDougall Creek, and Trail Creek. Workings of the Clear Creek Mine included 4 adits and 2 open cuts. Tunnel No. 1, driven S. 85° E., contained 2 crosscuts. Mineralization occurred in sheared iron-stained quartz veinlets and consisted of chalcopyrite, minor bornite, and pyrite. A sample (map no. 35) collected from the waste dump contained 155 ppm copper, 1.6 ppm silver, and 285 ppb gold. An open cut above the portal was cut into a shear zone trending N. 29° E. within the basalt bedrock. Mineralization consisted of disseminations and 1-in.-thick veins of chalcopyrite. A grab sample (map no. 35) contained 4,978 ppm copper, 4.6 ppm silver, 9,828 ppb gold, and over 10% iron. Tunnel No. 3 driven N. 90° E. was iced in at 20 ft. The adit appeared to be driven as a haulage tunnel. No visible mineralization was noted in the waste dump. An open cut, down stream, was cut to expose a 2-in.-wide iron-stained vein containing disseminated pyrite and chalcopyrite. A sample (map no. 34) collected from the vein contained 210 ppm copper, 162 ppm silver, 952 ppm zinc, and over 10% iron. Tunnel No. 4 was located further downstream. The adit was caved, though appeared to be driven N. 90° E. No visible mineralization was noted in the waste dump.

Workings of the Copper Queen prospect, located on Berg Creek, consisted of a caved adit driven into sheared and iron-stained basalt containing disseminated pyrite and chalcopyrite. A sample (map no. 39) collected from the waste dump contained 3,891 ppm copper, 5.0 ppm silver, and 542 ppb gold. The Berg Creek Mine operated by Ole Berg contained 5 tunnels. The Tunnel No. 5 "Working Level" was located because it is where the upper terminus of the aerial tramway is situated. The adit was not located because of the thick vegetative overgrowth. Two samples (map no. 40) collected next to the tramway station contained 4,515 and 2,872 ppm copper, 67.8 and 316.2 ppm silver, and 17.75 and 48.48 ppm gold, respectively.

MacDougall Creek contained the workings of the Calcite prospect and the War Eagle prospect. The Calcite prospect adit was driven S. 42° E. until caved at 53 ft. A sample (map no. 41) collected from the waste dump contained 32 ppm copper and 0.4 ppm silver. The War Eagle prospect adit was caved though appeared to be driven N. 48° E. Mineralization consisted of chalcopyrite, minor bornite, and disseminated pyrite. A sample (map no. 38) from the waste dump contained 876 ppm copper, 0.8 ppm silver, 42 ppm gold, and over 10% iron. The London and Cape prospect on Trail Creek consisted of a caved adit. This property was not visited due to adverse weather conditions.

The Elliott Hubbard Mining Co. had extensive workings along the entire Elliott Creek including the Copper King Mine. An iced and snowed in adit was located near the upper camp. The adit appeared to be driven S. 88° E. Mineralization consisted of malachite- and azurite-stained massive chalcocite, bornite, and chalcopyrite. A grab sample (map no. 36) collected from the waste dump contained 13.4% copper, 17.2 ppm silver, and 1,105 ppm manganese.

The Falls Creek prospect workings on Canyon Creek included 3 adits. No. 1 Adit, driven 149 ft. contained 1 crosscut. Mineralization consisted of malachite- and azurite-stained chalcopyrite and bornite. A sample (map no. 43) contained 6.2% copper and 6.2 ppm silver. No. 2 Adit was not located on the ground. No. 3 adit was driven N. 20° E. for 10 ft. into limestone and greenschist. No visible mineralization was noted in the adit or waste dump. Mineralized boulders, scattered along the valley floor, were derived from a shear zone above the adit. A chip sample (map no. 43) of the malachite- and azurite-stained quartz with disseminated pyrite and chalcopyrite contained 1,733 ppm copper and 0.5 ppm silver.

Patented properties located in the southern Wrangell Mountains area include the Copper King Mine, the Clear Creek Mine, the War Eagle prospect, and the Warner prospect.

RECOMMENDATIONS

The following recommendations are based on the historical literature search performed, field work completed, and samples collected for analysis during 1997.

Northern Wrangell Mountains area

Investigations in the northern Wrangell Mountains area disclosed no significant mineral properties within Ahtna selected lands other than the Nabesna, Royal Development Co., and Rambler Mines. Numerous shear zones were encountered, but the mineral values and the extent of mineralization do not warrant further exploration activity at this time. The Nabesna and Royal Development Co. Mines are patented property and could be available through negotiation with the current owner. Once the validity determination of the Rambler Mine has been completed by the NPS, the fate of this property will be known.

It is recommended that if Ahtna is looking for mineral properties in the northern Wrangell Mountains area, that it wait on the outcome of the NPS determination of the Rambler Mine and/or negotiate for the purchase/option of the Nabesna and Royal Development Co. Mines from its current owner.

Southern Wrangell Mountains area

The southern Wrangell Mountains area has numerous properties which contain mineral potential located within or close proximity to Ahtna selected lands. During this study, 11 properties were found to contain significant amounts of copper along with high levels of silver, gold, iron, and/or zinc. These properties included the Clear Creek, Copper King, Mullen, and Silver Star Mines, the Ammann Prospect, Bluebird, Cave Prospect, Fall Creek, Falls Creek, Hidden Treasure, and Peacock Claim prospects. Four other properties contained lower but still elevated mineral values, these included the Amy Creek, Copper Queen, Larson, and War Eagle prospects. The mineral values of the 11 properties ranged from 1.2 up to 50.15% copper, along with silver values up to 1,677.1 ppm, gold values up to 9,828 ppb, and 4 of the samples contained over 10% iron. Native copper was only found at the Homestake adit while massive chalcopyrite, bornite, and/or chalcocite mineralization was found at the other properties.

No estimation of tonnages or grades were completed on any of the properties visited during 1997. More detailed work needs to be completed on the properties, many of which were inaccessible because of their adits being caved. Most of the samples collected for this stage of the report were collected from either waste dumps or tailings piles located outside the portals. Very few of the properties had any mineralization exposed at the surface, due to the sloughing of the incompetent surface rock.

It is recommended that Ahtna consider any or all of the properties listed above in their selection process. More extensive mapping and sampling programs are planned for the 1998 field season on the following properties located within the Ahtna selections; the Homestake Adit and the Hidden Treasure prospect on Fall Creek, the Silver Star Mine on the Kluvesna River, and the Mullen Mine along with the Cave Prospect and the Peacock Claim on Copper Creek. Those properties located outside of the Ahtna selections that have high-grade mineralization include the Falls Creek prospect, and the Bluebird prospect and the Ammann Prospect on Copper Creek.

Five of the properties located in the southern Wrangell Mountains area have been historical producers. These were the Berg Creek, Clear Creek, Copper Creek, Mullen, and Silver Star Mines. See Appendix B for more detailed information on these mines and the other

occurrences described in this report. These properties should be given special consideration by Ahtna in their selections.

The following patented properties, the Copper King and Clear Creek mines and the War Eagle and Warner prospects, may become inholdings if Ahtna selects the surrounding lands.

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APPENDIX A - 1997 ANALYTICAL RESULTS WRANGELL-ST. ELIAS

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST. ELIAS

Map	Sample		Location							Au30	AuGrav	Ag
no.	AAWSE	Location Name	Latitude	Longitude	QUAD	SEC	TWP	RNG	ELEV	ppb	ppm	ppm
1	10030	Trail Creek main drainage, Placer (78-52)	62° 37' 52.411" N	143° 16' 17.473" W	Nab. C5	24	10N	11E	4535'	1144		0.2
2	10010	Trail Creek (78-133)	62° 37' 22.454" N	143° 14' 22.832" W	Nab. C5	30	10N	12E	4670'	<5		<.2
2	10011	Trail Creek (78-133)	62° 37' 22.885" N	143° 14' 20.517" W	Nab. C5	30	10N	12E	4670'	<5		<.2
2	10012	Trail Creek (78-133)	62° 37' 22.885" N	143° 14' 20.517" W	Nab. C5	30	10N	12E	4670'	80		0.5
2	10013	Trail Creek (78-133)	62° 37' 22.885" N	143° 14' 20.517" W	Nab. C5	30	10N	12E	4670'	14		<.2
3	10031	Trail Creek - Tributary, Placer (78-52)	62° 37' 09.618" N	143° 14' 59.138" W	Nab. C5	25	10N	11E	4470'	3122		0.3
4	10020	Trail Creek Cirque (78-05)	62° 37' 02.809" N	143° 13' 41.690" W	Nab. C5	30	10N	12E	5345'	<5		<.2
4	10021	Trail Creek Cirque (78-05)	62° 37' 04.857" N	143° 13' 32.991" W	Nab. C5	30	10N	12E	5400'	17		0.9
5	10019	Trail Creek Western Tributary	62° 37' 07.654" N	143° 16' 16.327" W	Nab. C5	25	10N	11E	4565'	<5		<.2
6	10006	Caribou Creek Prospect, Adit 1 (78-03)	62° 37' 28.137" N	143° 26' 59.860" W	Nab. C5	35	10N	10E	4860'	<5		<.2
6	10007	Caribou Creek Prospect, Adit 1 (78-03)	62° 37' 26.324" N	143° 27' 09.111" W	Nab. C5	35	10N	10E	4860'	<5		0.3
6	10008	Caribou Creek Prospect, Adit 1 (78-03)	62° 37' 26.995" N	143° 27' 02.084" W	Nab. C5	35	10N	10E	4860'	<5		<.2
7	10009	Trail Creek	62° 36' 29.282" N	143° 14' 07.689" W	Nab. C5	31	10N	12E	5850'	33		0.2
8	10029	Trail Creek main drainage, Placer (78-52)	62° 36' 31.269" N	143° 15' 53.990" W	Nab. C5	25	10N	11E	4185'	4321		<.2
9	10014	Caribou Creek, Mid. Fork, Placer (78-132)	62° 37' 03.139" N	143° 27' 27.293" W	Nab. C5	25	10N	10E	4205'	2951		0.6
9	10015	Caribou Creek, Mid. Fork, Placer (78-132)	62° 37' 01.375" N	143° 27' 33.123" W	Nab. C5	25	10N	10E	4155'	5227		0.4
10	10004	Eastern tributary of Caribou Creek	*62° 37' 16"N*	*143° 31' 25"W*	Nab. C6	27	10N	10E	4220'	<5		<.2
10	10005	Eastern tributary of Caribou Creek	62° 37' 14.832" N	143° 31' 17.614" W	Nab. C6	27	10N	10E	4080'	.11		<.2
11	10003	Caribou Creek West Trib.	62° 36' 44.890" N	143° 28' 37.536" W	Nab. C5	35	10N	10E	4565'	<5		<.2
12	10002	West Fork Caribou Creek	62° 36' 29.393" N	143° 27' 52.504" W	Nab. C5	36	10N	10E	4645'	<5		<.2
13	10016	Rock Creek Moly - Adit (78-51)	62° 35' 54.617" N	143° 21' 20.739" W	Nab. C5	33	10N	11E	5140'	<5		<.2
13	10017	Rock Creek Moly - Tailings (78-51)	62° 35' 54.617" N	143° 21' 20.739" W	Nab. C5	33	10N	11E	5140'	13		<.2
13	10018	Rock Creek Moly - Tailings (78-51)	62° 35' 54.617" N	143° 21' 20.739" W	Nab. C5	33	10N	11E	5140'	<5		<.2
14	10001	Caribou Creek East Trib.	62° 36' 10.820" N	143° 26' 20.712" W	Nab. C5	36	10N	10E	4535'	<5		<.2
15	10025	Alder Creek, East	62° 26' 37.053" N	142° 14' 23.272" W	Nab. B3	27	8N	17E	5880'	<5		<.2
16	10022	Alder Creek, Mid	62° 26' 40.629" N	142° 16' 27.287" W	Nab. B3	28	8N	17E	4550'	<5		<.2
16	10023	Alder Creek, Mid	62° 26' 42.164" N	142° 16' 31.926" W	Nab. B3	28	8N	17E	4605'	<5		0.4
16	10024	Alder Creek, Mid	62° 26' 43.968" N	142° 16' 34.856" W	Nab. B3	28	8N	17E	4610'	<5		0.2
17	10026	Alder Creek, West	62° 26' 43.534" N	142° 17' 21.071" W	Nab. B3	29	8N	17E	5920'	<5		<.2
18	10027	Rambler (78-36)	62° 23' 03.079" N	143° 00' 30.411" W	Nab. B5	16	7N	13E	3685'	>10000	8.68	103.3
19	10028	Camp Creek (78-11)	62° 20' 47.037" N	142° 43' 50.910" W	Nab. B4	36	7N	14E	5820'	<5		0.3
20	10033	Chichokna River	61° 55' 51.885" N	144° 30' 18.515" W	Val. D2	28	2N	5E	4700'	<5		0.2
21	10032	Chichokna River	61° 55' 03.733" N	144° 30' 44.850" W	Val. D2	33	2N	5E	4155'	<5		<.2
22	10052	Hidden Treasure (87-45)	61° 48' 00.115" N	143° 53' 04.397" W	Mc. D8	12	1S	8E	5620'	12		3
23	10037	Fall Creek - New Home (87-15)	61° 47' 29.965" N	143° 55' 50.555" W	Mc. D8	10	1S	8E	4440'	8		7.4
23	10038	Fall Creek - Homestead (87-15)	61° 47' 31.899" N	143° 56' 03.964" W	Mc. D8	10	1S	8E	4480'	6		8.5
24	10034	Silver Star (87-49)	61° 44' 18.003" N	143° 54' 13.259" W	Mc. C8	35	1S	8E	4955'	20		618.4
24	10035	Silver Star (87-49)	61° 44' 18.825" N	143° 54' 06.899" W	Mc. C8	35	1S	8E	4915'	177		1677.1
24	10036	Silver Star (87-49)	61° 44' 17.936" N	143° 54' 09.497" W	Mc. C8	35	1S	8E	4875'	<5		31.2
25	10048	Amy Creek Tunnel 6 (87-58)	61° 42' 25.017" N	143° 50' 50.725" W	Mc. C8	7	2S	8E	3810'	<5		<.2

All location measurements differentially corrected except for those in italics.

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST.ELIAS

Map	Sample	Cu	CuOL	Pb	Zn	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W	La	Al	Mg	Ca
no.	AAWSE	ppm	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	pct	pct
1	*10030*	*68*		<.2	93	2	43	17	0.3	<5	10	<5	4.49	795	<10	112	45	106	<20	<20	18	2.02	1.89	1.46
2	*10010*	*123*		<2	33	2	9	18	<.2	<5	8	<5	5.64	1177	<10	37	12	82	<20	<20	23	2.14	1.81	5.41
2	*10011*	*40*		6	46	<1	8	15	<.2	<5	11	<5	5.53	1453	<10	45	21	47	<20	<20	6	1.95	1.54	4.68
2	*10012*	*21*		2	20	<1	13	3	1.2	<5	394	<5	4.97	3457	<10	183	8	3	<20	<20	<1	0.2	3.23	>10
2	*10013*	*135*		<2	102	<1	55	32	<.2	<5	14	<5	6.56	1186	<10	367	82	159	<20	<20	10	4.39	2.54	0.85
3	*10031*	*73*		29	108	3	41	21	0.4	<5	25	<5	5.58	848	<10	99	55	129	<20	<20	19	1.85	1.59	2.66
4	*10020*	*42*		3	45	1	14	5	0.2	<5	<5	<5	2.19	151	<10	93	67	16	<20	<20	7	1.39	1.03	0.07
4	*10021*	*1037*		5	26	7	23	71	<.2	<5	<5	<5	>10	388	13	9	53	34	<20	<20	6	0.74	0.47	0.19
5	*10019*	*32*		5	58	1	13	14	<.2	<5	<5	<5	4.49	1079	<10	246	47	85	<20	<20	18	2.07	1.8	4.62
6	*10006*	*2*		9	90	<1	3	2	1.4	<5	<5	<5	0.64	641	<10	378	61	4	<20	<20	17	0.63	0.03	1.56
6	*10007*	*3.16*		<2	60	1	9	29	<.2	<5	<5	<5	7.84	681	<10	28	44	116	<20	<20	<1	3.08	1.24	1.18
6	*10008*	*137*		<2	37	<1	9	18	<.2	<5	<5	<5	4.87	352	<10	75	62	86	<20	<20	<1	3.22	1.22	1.31
7	*10009*	*332*		<2	33	3	31	22	0.4	<5	9	<5	4.49	1395	<10	14	39	50	<20	<20	<1	1.76	5.07	>10
8	*10029*	*69*		7	103	2	38	17	0.2	<5	22	<5	4.84	748	<10	139	57	126	<20	<20	18	1.73	1.74	2.7
9	*10014*	*31*		7	67	5	48	17	<.2	<5	<5	<5	6.91	525	11	49	97	299	<20	<20	12	0.98	1.09	0.54
9	*10015*	*33*		21	84	3	54	20	<.2	<5	<5	<5	8.72	561	15	41	128	411	<20	<20	16	0.89	1.09	0.49
10	*10004*	*44*		<2	30	<1	13	12	<.2	<5	<5	<5	3.34	217	<10	97	61	69	<20	<20	2	3.92	0.74	2.5
10	*10005*	*3*		5	14	<1	13	11	<.2	<5	<5	<5	3.32	224	<10	64	62	55	<20	<20	13	1.22	0.61	0.9
11	*10003*	*28*		11	33	<1	5	14	<.2	<5	8	<5	5.57	562	<10	48	40	84	<20	<20	3	1.78	0.89	0.58
12	*10002*	*37*		42	89	<1	5	12	<.2	<5	<5	<5	5.57	963	<10	31	30	58	<20	<20	2	1.75	1.39	0.2
13	*10016*	*27*		<2	30	3	61	23	<.2	<5	<5	<5	4.17	675	<10	25	124	118	<20	<20	<1	2.75	1.99	3.49
13	*10017*	*81*		<2	85	4	20	22	<.2	<5	6	<5	6.03	1180	<10	61	74	133	<20	<20	24	2.92	2.18	3.42
13	*10018*	*13*		3	26	3	3	5	<.2	<5	<5	<5	2.14	485	<10	45	52	23	<20	<20	33	0.53	0.25	0.64
14	*10001*	*58*		3	58	<1	9	18	<.2	<5	15	<5	5.89	1054	<10	47	27	98	<20	<20	<1	3.49	1.88	1.27
15	*10025*	*149*		<2	34	<1	7	15	<.2	<5	<5	<5	2.87	470	<10	33	37	75	<20	<20	11	1.03	0.49	1.41
16	*10022*	*133*		<2	41	6	24	19	<.2	<5	<5	<5	3.6	348	<10	106	63	95	<20	<20	7	1.49	0.87	1.57
16	*10023*	*883*		3	34	1	18	19	<.2	<5	<5	<5	4.59	178	<10	45	58	51	<20	<20	7	1.01	0.45	1.05
16	*10024*	*360*		<2	51	<1	5	43	<.2	<5	<5	<5	9.87	650	<10	60	29	410	<20	<20	<1	3.03	2.75	3.22
17	*10026*	*50*		<2	48	<1	23	26	<.2	<5	<5	<5	5.71	638	<10	50	91	193	<20	<20	2	2.84	2.23	3.08
18	*10027*	*3301*		1960	3956	<1	5	63	33.1	1238	93	<5	>10	100	<10	<1	22	3	<20	<20	<1	0.05	0.08	0.09
19	*10028*	*107*		<2	201	<1	35	40	<.2	<5	<5	<5	7.74	1209	<10	5	31	255	<20	<20	2	1.79	1.19	9.26
20	*10033*	*95*		2	36	2	7	7	<.2	<5	<5	<5	2.36	354	<10	150	63	90	<20	<20	8	1.27	0.83	0.82
21	*10032*	*25*		<2	37	1	3	5	<.2	<5	11	8	3.22	587	<10	43	39	99	<20	<20	12	0.92	0.51	1.36
22	*10052*	*>10000*	*3.3*	<2	73	2	46	23	9.3	<5	<5	<5	4.85	731	<10	21	101	115	<20	<20	2	2.56	2.17	2.74
23	*10037*	*5354*		<2	58	2	46	17	0.6	<5	8	21	4.66	547	<10	354	127	139	<20	<20	3	3.26	1.58	4.65
23	*10038*	*>10000*	*2.9*	<2	71	2	62	22	<.2	<5	33	<5	5.82	748	<10	477	141	194	<20	<20	3	5.03	1.75	7.46
24	*10034*	*5811*		404	989	5	6	10	44.7	<5	467	>2000	1.08	804	<10	130	106	9	<20	<20	2	0.22	0.04	7.83
24	*10035*	*>10000*	*2.6*	158	3060	2	6	35	149.1	29	1829	>2000	1.23	933	<10	86	54	16	<20	<20	2	0.37	0.09	>10
24	*10036*	*513*		39	91	15	4	3	3.6	<5	30	158	0.81	329	<10	682	75	5	<20	<20	<1	0.08	<.01	3.11
25	*10048*	*183*		<2	56	2	36	10	<.2	<5	8	<5	5.76	526	<10	139	115	129	<20	<20	4	2.41	1.84	1.32

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST.ELIAS

Map	Sample	Na	K	Sr	Y	Ga	Li	Nb	Sc	Ta	Ti	Zr
no.	AAWSE	pct	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	ppm
1	*10030*	0.06	0.12	89	9	5	29	<1	7	<10	0.13	10
2	*10010*	0.04	0.37	147	11	5	22	4	<5	<10	<.01	6
2	*10011*	0.05	0.41	236	7	4	25	3	<5	<10	<.01	7
2	*10012*	0.01	0.08	396	8	<2	1	6	<5	<10	<.01	6
2	*10013*	0.18	1.39	55	12	6	30	4	17	<10	0.16	4
3	*10031*	0.03	0.11	117	10	3	18	<1	8	<10	0.15	10
4	*10020*	0.04	0.13	17	3	2	14	<1	<5	<10	<.01	2
4	*10021*	0.02	0.07	6	4	2	3	2	<5	<10	<.1	7
5	*10019*	0.05	0.12	311	7	7	33	3	6	<10	<.01	5
6	*10006*	0.06	0.32	31	8	<2	<1	<1	<5	<10	<.01	22
6	*10007*	0.26	0.08	82	8	<2	5	4	8	<10	0.19	3
6	*10008*	0.39	0.18	87	4	<2	2	3	5	<10	0.16	1
7	*10009*	0.01	0.07	202	9	<2	21	6	10	<10	<.01	1
8	*10029*	0.03	0.1	104	9	3	18	<1	7	<10	0.14	9
9	*10014*	0.03	0.03	42	4	<2	4	<1	<5	<10	0.26	6
9	*10015*	0.03	0.02	40	4	<2	3	<1	<5	<10	0.33	6
10	*10004*	0.59	0.46	134	8	<2	6	4	7	<10	0.16	9
10	*10005*	0.09	0.14	139	8	<2	4	3	<5	<10	0.16	11
11	*10003*	0.07	0.09	65	6	<2	5	3	9	<10	0.13	6
12	*10002*	0.09	0.11	23	3	<2	2	2	<5	<10	0.08	5
13	*10016*	0.6	0.29	48	7	<2	3	4	16	<10	0.1	9
13	*10017*	0.34	0.55	105	9	<2	13	4	14	<10	0.19	5
13	*10018*	0.09	0.28	31	9	<2	3	2	<5	<10	0.08	8
14	*10001*	0.24	0.16	72	7	<2	6	3	8	<10	0.13	5
15	*10025*	0.17	0.16	124	8	<2	6	2	<5	<10	0.13	8
16	*10022*	0.23	0.22	76	9	<2	9	3	6	<10	0.19	7
16	*10023*	0.09	0.19	81	6	<2	7	2	<5	<10	0.16	7
16	*10024*	0.52	0.37	183	7	<2	7	7	26	<10	0.36	12
17	*10026*	0.34	0.24	254	7	<2	10	5	13	<10	0.21	9
18	*10027*	<.01	<.01	4	<1	<2	<1	<1	<5	<10	<.01	11
19	*10028*	0.03	0.03	20	20	<2	10	8	20	<10	0.73	60
20	*10033*	0.19	0.27	10	6	<2	4	2	7	<10	0.14	3
21	*10032*	0.16	0.13	71	8	<2	3	2	<5	<10	0.1	4
22	*10052*	0.01	0.13	13	8	<2	9	8	7	<10	0.4	14
23	*10037*	<.01	0.03	24	9	<2	8	6	12	<10	0.38	23
23	*10038*	<.01	<.01	28	13	4	4	11	23	<10	0.32	15
24	*10034*	<.01	0.07	335	3	<2	<1	2	<5	<10	<.01	<1
24	*10035*	<.01	0.07	47	4	<2	1	5	<5	<10	<.01	<1
24	*10036*	<.01	0.03	1321	<1	<2	<1	<1	<5	<10	<.01	<1
25	*10048*	0.07	0.05	27	9	<2	9	4	8	<10	0.51	8

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST. ELIAS

Map	Sample		Location							Au30	AuGrav	Ag
no.	AAWSE	Location Name	Latitude	Longitude	QUAD	SEC	TWP	RNG	ELEV	ppb	ppm	ppm
25	10049	Amy Creek Tunnel 7 (87-58)	61° 42' 22.775" N	143° 50' 35.386" W	Mc. C8	7	2S	8E	3875'	<5		0.3
26	10050	Amy Creek Tunnel 8 (87-58)	61° 42' 11.105" N	143° 50' 38.788" W	Mc. C8	7	2S	8E	4170'	<5		<.2
27	10051	Larson (87-56)	61° 42' 08.461" N	143° 51' 46.415" W	Mc. C8	12	2S	8E	4880'	<5		<.2
28	10046	Rock Creek	61° 41' 36.659" N	143° 56' 47.032" W	Mc. C8	15	2S	8E	3045'	<5		0.7
28	10046A	Rock Creek	61° 41' 36.659" N	143° 56' 47.032" W	Mc. C8	15	2S	8E	3045'	<5		<.2
28	10047	Rock Creek	61° 41' 36.113" N	143° 56' 47.832" W	Mc. C8	15	2S	8E	3030'	<5		<.2
29	10039	Mullen Open Cut (86-126)	*61° 40' 30" N*	*144° 03' 57" W*	Val. C1	24	2S	7E	3850'	38		40.5
29	10039A	Mullen Open Cut High Grade (86-126)	*61° 40' 30" N*	*144° 03' 57" W*	Val. C1	24	2S	7E	3850'	45		109.7
29	10040	Mullen No. 1 (86-126)	61° 40' 34.371" N	144° 03' 53.492" W	Val. C1	24	2S	7E	3755'	<5		23.6
29	10041	Ammann Prospect (87-194)	61° 40' 33.607" N	144° 04' 02.402" W	Val. C1	24	2S	7E	3880'	8		6.4
30	10043	Copper Creek Cave Prospect (87-192)	61° 40' 18.381" N	144° 04' 02.402" W	Val. C1	25	2S	7E	4135'	533		30.6
31	10042	Copper Creek Peacock Claim (87-193)	61° 40' 14.790" N	144° 03' 39.530" W	Val. C1	25	2S	7E	4140'	77		4.8
32	10044	Bluebird (86-139)	61° 39' 48.261" N	144° 01' 54.261" W	Val. C1	30	2S	8E	5050'	<5		103.6
32	10045	Bluebird adit (86-139)	61° 39' 48.261" N	144° 01' 54.261" W	Val. C1	30	2S	8E	5050'	32		10.3
33	10056	Clear Creek - Tunnel 2 (87-63)	61° 37' 50.057" N	143° 50' 50.595" W	Mc. C8	7	3S	9E	5585'	8000		66.3
33	10057	Clear Creek - Tunnel 2 (87-63)	61° 37' 50.057" N	143° 50' 50.595" W	Mc. C8	7	3S	9E	5585'	665		9.4
34	10058	Clear Creek Open Cut (87-63)	61° 37' 38.869" N	143° 50' 58.226" W	Mc. C8	7	3S	9E	5095'	162		<.2
35	10054	Clear Creek Adit 1 (87-63)	61° 37' 24.608" N	143° 50' 24.448" W	Mc. C8	7	3S	9E	5035'	285		1.6
35	10055	Clear Creek Open Cut (87-63)	61° 37' 24.518" N	143° 50' 19.761" W	Mc. C8	7	3S	9E	5125'	9828		4.6
36	10063	Elliot Creek, Copper King (86-140)	61° 38' 12.130" N	144° 02' 03.251" W	Val. C1	6	3S	8E	4705'	16		17.2
37	10053	Porcupine Creek Open Cut	61° 37' 03.542" N	143° 47' 20.245" W	Mc. C8	9	3S	9E	4600'	25		<.2
38	10061	MacDougal Creek - War Eagle (87-57)	61° 33' 32.068" N	143° 44' 36.985" W	Mc. C8	34	3S	9E	3570'	42		0.8
39	10062	MacDougal Creek - Copper Queen (87-70)	61° 33' 31.285" N	143° 45' 27.753" W	Mc. C8	34	3S	9E	3325'	542		5
40	10059	Berg Creek Tunnel No. 5 (87-73)	61° 33' 09.332" N	143° 47' 19.801" W	Mc. C8	4	4S	9E	2825'	>10000	17.75	67.8
40	10060	Berg Creek Tunnel No. 5 (87-73)	61° 33' 09.332" N	143° 47' 19.801" W	Mc. C8	4	4S	9E	2825'	>10000	48.48	316.2
41	10068	MacDougal Creek - Calcite (87-77)	61° 32' 48.777" N	143° 43' 13.397" W	Mc. C8	2	4S	9E	4930'	<5		0.4
42	10066	Gilahina Tributary	61° 28' 47.622" N	143° 36' 12.588" W	Mc. B7	33	4S	10E	4470'	<5		<.2
42	10067	Gilahina Tributary	61° 28' 47.416" N	143° 36' 11.820" W	Mc. B7	33	4S	10E	4480'	30		<.2
43	10064	Falls Creek No. 1 (86-105)	61° 21' 13.668" N	144° 15' 38.732" W	Val. B1	13	6S	6E	4695'	329		6.2
43	10065	Falls Creek Quartz Boulder (86-105)	61° 21' 16.294" N	144° 15' 32.238" W	Val. B1	13	6S	6E	4560'	22		0.5

All location measurements differentially corrected except for those in italics.

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST.ELIAS

Map	Sample	Cu	CuOL	Pb	Zn	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W	La	Al	Mg	Ca
no.	AAWSE	ppm	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	pct	pct
25	*10049*	*244*		21	96	2	58	19	0.5	<5	9	<5	4.63	357	<10	21	96	77	<20	<20	2	1.48	0.86	2.73
26	*10050*	*211*		2	74	2	46	19	0.3	<5	<5	<5	5.37	723	<10	32	80	123	<20	<20	4	2.21	1.84	3.36
27	*10051*	*188*		2	84	1	53	22	<.2	<5	<5	<5	5.03	792	<10	9	122	144	<20	<20	3	2.6	2.38	3.18
28	*10046*	*1468*		9	53	<1	7	6	<.2	13	674	<5	1.05	117	<10	50	33	13	<20	<20	<1	0.98	0.03	3.87
28	*10046A*	*259*		7	27	<1	3	1	<.2	6	231	<5	0.51	7	<10	44	42	9	<20	<20	<1	1.08	0.02	0.1
28	*10047*	*213*		8	39	<1	3	<1	<.2	21	936	<5	0.32	7	<10	39	55	7	<20	<20	<1	1.04	0.02	0.11
29	*10039*	*>10000*	*34.46*	13	45	93	<1	3	168.1	<5	1635	40	>10	48	<10	10	8	7	<20	132	<1	0.07	0.69	2.43
29	*10039A*	*>10000*	*36.64*	19	25	18	<1	<1	40.5	19	143	<5	>10	3	60	2	4	37	24	73	40	0.08	0.02	0.84
29	*10040*	*>10000*	*12.2*	5	27	16	<1	2	286.1	<5	429	11	1.83	175	<10	15	10	6	<20	<20	<1	0.07	6.03	>10
29	*10041*	*>10000*	*1.2*	4	13	1	2	<1	16.6	<5	47	<5	0.27	184	<10	21	8	6	<20	<20	1	0.12	0.34	>10
30	*10043*	*>10000*	*16.95*	22	41	2	27	12	1.1	<5	<5	<5	9.07	391	<10	8	61	158	<20	27	3	1.82	1.87	3.3
31	*10042*	*>10000*	*3.1*	2	59	2	50	18	2.8	<5	11	<5	5.98	519	<10	11	35	124	<20	<20	3	3.39	1.66	3.38
32	*10044*	*>10000*	*50.15*	37	47	11	8	8	6.8	<5	17	<5	7.46	195	59	4	9	70	<20	106	14	0.4	0.17	0.86
32	*10045*	*>10000*	*6.4*	7	43	2	23	6	4.9	<5	8	<5	9.23	166	<10	10	80	129	<20	<20	2	2.64	0.41	4.62
33	*10056*	*>10000*	*8.8*	30	1208	5	347	262	6.7	16	15	<5	>10.0	115	<10	<1	38	12	<20	21	<1	0.25	0.19	0.35
33	*10057*	*>10000*	*2.9*	5	<1	1	61	37	1.3	<5	<5	<5	8.82	1329	<10	<1	103	113	<20	<20	3	3.05	2.65	4.54
34	*10058*	*210*		4	952	1	14	40	<.2	<5	5	<5	>10.0	232	<10	23	53	146	<20	<20	2	2.41	1.81	0.91
35	*10054*	*155*		19	46	107	37	45	<.2	<5	<5	<5	5.54	861	<10	7	113	56	<20	<20	3	1.5	0.98	4.93
35	*10055*	*4978*		25	47	9	28	45	<.2	35	87	<5	>10.0	110	17	7	141	65	<20	<20	<1	0.92	0.59	0.15
36	*10063*	*>10000*	*13.4*	11	30	1	29	29	0.7	<5	<5	<5	4.62	1105	<10	6	67	119	<20	22	4	2.96	1.82	4.55
37	*10053*	*1757*		3	29	4	65	55	<.2	<5	<5	<5	9.81	289	<10	8	96	170	<20	<20	3	1.83	0.71	0.97
38	*10061*	*876*		5	36	1	16	21	<.2	<5	<5	<5	>10	392	<10	1	21	173	<20	<20	<1	0.49	1.07	1.66
39	*10062*	*3891*		4	42	4	5	11	<.2	<5	<5	<5	6.5	649	<10	1	58	12	<20	<20	<1	0.48	0.22	2.9
40	*10059*	*4514*		6	26	16	6	1	0.3	<5	<5	14	2.57	166	47	6	146	23	<20	<20	1	0.57	0.33	0.6
40	*10060*	*2872*		12	16	22	7	2	<.2	11	9	<5	8.01	164	203	4	161	9	<20	<20	<1	0.22	0.1	1.49
41	*10068*	*32*		<2	16	1	5	4	<.2	<5	<5	<5	5.16	710	<10	2	38	29	<20	<20	9	2.21	1.11	4.69
42	*10066*	*161*		10	83	<1	5	4	<.2	<5	<5	<5	2.39	1144	<10	227	83	41	<20	<20	6	1.84	0.9	0.87
42	*10067*	*211*		12	142	3	4	4	<.2	<5	<5	<5	8.7	152	<10	77	23	68	<20	<20	3	1.92	0.6	0.03
43	*10064*	*>10000*	*6.2*	4	29	1	26	8	5.4	<5	<5	<5	6.5	252	<10	1	81	80	<20	<20	2	1.36	0.68	1.78
43	*10065*	*1733*		4	16	1	19	5	0.2	<5	<5	<5	1.44	209	<10	1	191	44	<20	<20	1	0.63	0.59	1.29

APPENDIX A - 1997 ANALYTICAL RESULTS
WRANGELL - ST.ELIAS

Map	Sample	Na	K	Sr	Y	Ga	Li	Nb	Sc	Ta	Ti	Zr
no.	AAWSE	pct	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	ppm
25	*10049*	0.07	<.01	12	7	<2	4	3	<5	<10	0.44	10
26	*10050*	0.05	0.1	26	11	<2	9	3	<5	<10	0.4	11
27	*10051*	0.04	0.01	49	9	<2	9	6	<5	<10	0.48	11
28	*10046*	<.01	0.26	42	6	<2	9	1	<5	<10	<.01	2
28	*10046A*	<.01	0.2	17	2	<2	9	<1	<5	<10	<.01	2
28	*10047*	<.01	0.21	13	<1	<2	9	<1	<5	<10	<.01	2
29	*10039*	<.01	<.01	22	<1	33	<1	37	<5	32	<.01	2
29	*10039A*	<.01	<.01	1	<1	10	<1	2	<5	<10	<.01	<1
29	*10040*	<.01	0.02	74	<1	<2	<1	23	<5	12	<.01	<1
29	*10041*	<.01	<.01	234	1	<2	1	4	<5	<10	<.01	<1
30	*10043*	0.02	0.02	10	14	<2	17	23	11	18	0.33	27
31	*10042*	0.04	0.03	15	11	<2	7	9	<5	<10	0.37	16
32	*10044*	0.01	<.01	3	2	2	1	3	<5	<10	0.09	6
32	*10045*	0.04	<.01	18	6	4	1	11	5	<10	0.34	20
33	*10056*	<.01	<.01	9	<1	<2	<1	4	<5	12	0.05	5
33	*10057*	<.01	0.02	123	6	3	4	8	9	<10	0.17	8
34	*10058*	0.19	0.75	400	5	<2	14	<1	10	<10	0.21	8
35	*10054*	<.01	0.17	90	6	<2	6	4	6	<10	0.12	7
35	*10055*	0.04	0.11	9	2	<2	5	<1	6	<10	0.09	5
36	*10063*	0.01	0.15	16	16	<2	12	25	15	17	0.48	24
37	*10053*	0.08	0.1	36	9	<2	5	<1	9	<10	0.45	9
38	*10061*	0.02	0.07	25	<1	<2	3	<1	<5	<10	0.01	6
39	*10062*	<.01	<.01	7	2	<2	<1	<1	<5	<10	0.04	7
40	*10059*	<.01	0.09	10	1	<2	2	<1	<5	<10	<.01	2
40	*10060*	<.01	0.06	8	<1	<2	<1	<1	<5	<10	<.01	3
41	*10068*	<.01	<.01	287	4	7	2	4	<5	<10	0.07	7
42	*10066*	0.06	0.12	90	4	<2	11	2	<5	<10	0.1	7
42	*10067*	0.01	0.12	5	3	2	6	<1	10	<10	<.01	5
43	*10064*	0.04	<.01	101	5	<2	2	10	<5	<10	0.51	15
43	*10065*	0.04	<.01	6	3	<2	2	<1	5	<10	0.13	1

APPENDIX B - PROPERTY SUMMARY SHEETS WRANGELL-ST. ELIAS

ALASKA COPPER MINES

MAS no: 0020860128 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Sport Nos. 2-3
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Unknown

Location: At approximately the 2,150 ft. elevation on the west side of the mouth of Pass Creek, a southern tributary of the Kotsina River.

Township: 002 S. ***Range:*** 008 E. ***Section:*** 07
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology

History and production:
1958 - Two claims staked by Scott Simenstad (KX 86-153).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 86-153

AMMANN PROSPECT

MAS no: 0020860194 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper, silver
Deposit type: Basaltic Cu

Location: Located between the 3,860 ft. and the 3,940 ft. elevation, west of the Mullen Prospect, between Copper Creek and a western tributary. Copper Creek is a southern tributary of the Kotsina River.

Township: 002 S. *Range:* 007 E. *Section:* 25
Quadrangle: Valdez C-1 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:

Claims staked by Adolph Ammann (Date unknown).
Underground work done after 1914 (Van Alstine and Black, 1946).

Operating data:

Upper Adit - driven S. 5° E. for 25 ft. (Van Alstine and Black, 1946).
Lower Adit (Main Adit) - driven S. 32° W. for 473 ft. then S. 17° E. for 11 ft. (Van Alstine and Black, 1946).

Geologic setting:

Ammann Prospect Upper - Bedrock consists of Chitistone limestone. No copper mineralization was noted in the adit. The adit appears to be driven to undercut a discontinuous mineralized zone outcropping 25 ft. above the portal. A mineralized breccia zone 2 to 6 in. thick striking east and dipping 45° W. contains quartz, pyrite, bornite, chalcopyrite, chalcocite, covellite, malachite, and azurite (Van Alstine and Black, 1946).

Ammann Prospect Lower (Main Adit) - Bedrock consists of Chitistone limestone on the nose of a small anticline. The limestone strikes N. 75° E. and dips 75° N. at the portal but at the face strikes N. 28° E. and dips 65° W. Limestone cut by discontinuous irregular, less than ¼ in. thick, veinlets of malachite, azurite, and calcite (Van Alstine and Black, 1946).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located two adits (one caved) and sampled open adit location during 1997.

Ammann Prospect Upper

Adit was open and driven S. 52° E. for 19 ft. The limestone face contained up to 2 in. wide calcite veins. No visible mineralization was noted in the adit. Latitude N 61° 40' 32"; Longitude W 144° 04' 05"; Elevation 3,940 ft. No sample collected, no visible mineralization was noted in the waste dump.

Ammann Prospect Lower (Main Adit)

Adit was caved at the portal, but appeared to be driven N. 88° E. The surrounding bedrock was not exposed due to the local vegetation. Limestone float containing up to 3/4 in. calcite veins with malachite, azurite, chalcopyrite, and pyrite mineralization was noted in the waste dump.

Latitude N 61° 40' 34"; Longitude W 144° 04' 03"; Elevation 3,860 ft.

A sample (AAWSE 10041) of the mineralization collected from the waste dump contained 1.2% Cu, 6.4 ppm Au, and 8 ppb Ag.

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Van Alstine, R.E., and Black, R.F., 1946, Copper deposits of the Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 947-G, p. 125-126.

AMY CREEK

MAS no: 0020870058 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Ames [sic] Creek
Company name(s):
Great Northern Development Co.
Mineral survey(s):

Commodity: Copper
Deposit type: Carbonate-hosted Fe skarn

Location: Three adits located on Amy Creek. Tunnel 6 is located at the 3,810 ft. elevation on the west side of the creek. Tunnel 7 is located at the 3,875 ft. elevation on the east side of the creek across from Tunnel 6. Tunnel 8 is located at the 4,170 ft. elevation on the east side of Amy Creek ¼ mile south of Tunnel 7. Amy Creek is a southern tributary of the Kotsina River between Rock Creek and Roaring Creek.

Township: 002 S. ***Range:*** 009 E. ***Section:*** 07
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:

1906 - Claims staked (KX 87-042).
- Prospecting started (Moffit and Mertie, 1923).

1907 - Prospecting work done (Moffit and Maddren, 1908).
Tunnel 6 - driven 50 ft. southwest.
Tunnel 7 - driven 70 ft. N. 30° E.
Tunnel 8 - driven 30 ft.

1908 - Development work on the tunnels continued (Moffit, 1909).

Operating data:

1907 - Three tunnels (Moffit and Maddren, 1908).
Tunnel 6 - 50 ft.
Tunnel 7 - 70 ft.
Tunnel 8 - 30 ft.

1977 - Two caved adits located (USBM field notes).

Geologic setting:

Most of the valley made up of tuff, basalt, shale, and chert of the Strelna Formation. Rocks have been folded and faulted and locally mineralized with pyrite and its oxidation products. Along shear zones, that have identical bedding and flow planes as the country rock, the rocks have become schistose in character (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

USBM
- Site visit in 1977. Located two caved adits, no mineralization noted (USBM field notes).

BLM

- Located three adits (two caved) and collected samples during 1997.

Tunnel 6

Adit caved at the portal, appeared to be driven N. 70° E. Bedrock made up of basalt highly sheared and iron-stained. Mineralization consisted of disseminated pyrite and minor chalcopyrite.

Latitude N 61° 42' 25"; Longitude W 143° 50' 51"; Elevation 3,810 ft.

A sample (AAWSE 10048) of the mineralization collected from the waste dump contained 183 ppm Cu and less than 0.2 ppm Ag.

Tunnel 7

Adit caved at the portal, appeared to be driven N. 88° E. Bedrock made up of basalt highly sheared and iron-stained. Mineralization consisted of disseminated and veinlets pyrite and minor chalcopyrite associated with quartz.

Latitude N 61° 42' 22"; Longitude W 143° 50' 35"; Elevation 3,875 ft.

A sample (AAWSE 10049) of the mineralization collected from the waste dump contained 244 ppm Cu and 0.3 ppm Ag.

Tunnel 8

Adit open, but sloughed at portal and filled with water. Adit driven S. 35° E. an unknown length, but driven at least 50 ft. where it has collapsed. Bedrock made up of basalt highly sheared and iron-stained. Mineralization consisted of disseminated and veinlets of pyrite and chalcopyrite.

Latitude N 61° 42' 11"; Longitude W 143° 50' 39"; Elevation 4,170 ft.

A sample (AAWSE 10050) of the mineralization collected from the waste dump contained 211 ppm Cu and less than 0.2 ppm Ag.

References:

Bibliography:

ALASKA KARDEX 87-042

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BEE JAY

MAS no: 0020780078 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Bee Jay 1-8
Company name(s):
Mineral survey(s):

Commodity: Copper, silver, gold, lead
Deposit type: Unknown

Location: At approximately the 3,450 ft. elevation on the east side of the mouth of Soda Creek, a tributary of Platinum Creek.

Township: 009 N. ***Range:*** 013 E. ***Section:*** 34
Quadrangle: Nabesna C-4 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Raw prospect

Development and Geology

History and production:
1964 - Eight claims staked by Bernard Locke and John Joslen (KX 78-066).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for during 1997.

References:

Bibliography:
ALASKA KARDEX 78-066

BERG CREEK MINE

MAS no: 0020870073 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Camp Bird Lode
Century Lode
Dupont Lode
Engineer Syndicate
Golconda
Gold Eagle
Hercules Lode
May Day Lode
Midas Burdick
Midas Gold Mine
Minnehaha Lode
Morning Lode
North Midas Mine
North Midas 1-4
Ole Berg Property
Sunrise No. 1-3 Lode
North Midas Millsite
Triple M Millsite

Company name(s):
Kelley Development Co.
North Midas Copper Co.

Commodity: Gold, silver, copper
Deposit type: Carbonate-hosted Fe skarn

Mineral survey(s):
M.S. 1558 A&B

Patent number(s):

Location: Located between the 2,850 and 3,000 ft. elevations on the west side of Berg Creek, a southern tributary of the Kuskulana River. The mill site is located at the 2,835 ft. elevation near the junction of Berg and MacDougall Creeks.

Township: 004 S. ***Range:*** 009 E. ***Section:*** 04
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer

Development and Geology:

History and production:

1907 - Ole Berg discovered the mineralization (Moffit and Mertie, 1923). Eighteen lode and 4 placer claims along with 1 power claim.
1913 - Development work done (Brooks, 1914).
1914 - Only assessment work done (Moffit, 1915).
1915 - Development work done (Brooks, 1916).
1916 - Development work done on Tunnel No. 4 driven 80 ft. (Moffit, 1918).
1918 - Mill and cyanide plant completed and put into operation (Martin, 1919a).
- A carload of ore produced and shipped. Tunnel No. 5 developed (Martin, 1919a).

1919 - Tram line (3.5 cu. ft. bucket capacity) started, development and mining done (Brooks, 1921).
- Mill was run for a short period of time due to high water on Berg Creek (Moffit and Mertie, 1923).

1920 - Underground work done, but the mill was not operated (Brooks, 1922).

1921 - Claims staked by Gordon Burdick, W.D. Rich, and J.F. Crane (KX 87-014).

1922 - Development work done (Brooks and Capps, 1924).
- Cyanide plant replaced by a flotation plant with gold and silver-bearing pyrite concentrated to a shipping product. Concentrates hauled by tractor 12 miles to Strelna and shipped on the Copper River & Northwestern Railway (Brooks and Capps, 1924).
- Semi diesel installed as source of auxiliary power (Brooks and Capps, 1924).

1923 - Productive mining accomplished (Brooks, 1925).

1925 - Two men doing assessment work of surface stripping (Shepard, 1926).

1943 - Adits No. 1, 2, 3 were caved at the portals, No. 4 was ice blocked at 60 ft., No. 5 was ice blocked at 150 ft. (Van Alstine and Black, 1946).

1965 - Claims staked by Robert C. and Vera Moore (KX 87-133).

Production:

1918 - A carload of ore produced and shipped during the winter (Martin, 1919b).

1919 - A few ounces of gold and silver produced (Moffit and Mertie, 1923).

Operating data:

1916 - Four crosscuts driven to intersect ore (Smith, 1917b).
- Four tunnels, three started prior to 1916, with a combined length of 1,150 ft., Tunnel No. 4 was 80 ft. long (Moffit, 1918).

1918 - Tunnel No. 5 (highest tunnel) known as the "working tunnel" was driven 570 ft. (Martin, 1919b).
- Ore was originally mined from Tunnel No. 4. Tunnel No. 5, the "working tunnel", cuts the vein 570 ft. from the portal and 120 ft. vertically below No. 4 (Martin, 1919b).
- Mill and cyanide plant (Martin, 1919b).
The 25 ton per day mill included Blake and Wheeling crushers, a Denver ball mill, a Dorr thickener, mechanical agitators, and an Oliver filter. The cyanide plant used an all-slime process with precipitation by zinc shavings (Martin, 1919b).
- Power plant with a 14 to 8 in. pipeline 2,200 ft. long, with 200 ft. head and an 60 hp. Castle wheel (Moffit, 1921).
- A Roebling tram, 4,600 ft. long, with a 1,000 ft. drop, 500 pound automatic loading and discharge buckets, and a capacity of 5 tons per hour (Moffit, 1921).

1919 - Over 1,600 ft. of levels and adits driven. Two levels 100 ft. apart and a short intermediate level driven from the upper level. Ore drawn off from the lower level (Brooks, 1921).

Tunnel No. 1

Located at the 3,000 ft. elevation 1,200 ft. from Berg Creek. Driven 480 ft. S. 5° E. Mineralization includes magnetite, pyrite, and chalcopyrite (Moffit and Mertie, 1923).

Tunnel No. 2

Located 500 ft. southwest of Tunnel No. 1 at the 3,250 ft. elevation. Driven 140 ft. in

a southerly direction with a short crosscut 100 ft. from the portal. A shallow winze was sunk in the eastern crosscut (Moffit and Mertie, 1923). Mineralization includes pyrite and chalcopyrite.

Tunnel No. 3

Located 1,000 ft. southwest of Tunnel No. 2 at the 3,175 to 3,200 ft. elevation. Driven nearly 500 ft. to the south-southeast. Mineralization includes pyrite and chalcopyrite (Moffit and Mertie, 1923).

Tunnel No. 4

Located 450 ft. south-southwest from Tunnel No. 5 at the 2,900 ft. elevation. Driven following the vein which strikes N. 70° E. and dips 45° S. (Moffit and Mertie, 1923).

Tunnel No. 5

Located at the 2,800 ft. elevation. Driven following the vein which strikes N. 70° E. and dips 45° S. (Moffit and Mertie, 1923).

Geologic setting:

Bedrock consists of extremely altered and much faulted Chitistone Limestone and Nikolai Greenstone intruded by light-colored diorite porphyry. Mineralization including magnetite, pyrite, gold, and chalcopyrite was deposited along a fault plane (Moffit, 1921). Tunnel No. 4 yielded high values of gold giving the notion to mine for gold verses copper (Moffit, 1918). A vein 1½ to 6 ft. wide, averaging 2 or 3 ft. wide, made up of quartz and chalcopyrite with copper carbonate staining strikes N. 70° E. (Moffit, 1921) and dips 45 to 55° SE. (Martin, 1919b).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located the Millsite and "Working Tunnel" Tunnel No. 5 level during 1997. Vegetation at the site is very thick making location of the portal extremely difficult.

Tunnel No. 5 - "Working Tunnel" level

Upper terminus of aerial tramway. The actual portal was not located due to the density of the alder regrowth covering the workings. Mineralization collected from the ore bunker beneath the upper tramway station consisted of malachite, azurite, and chalcopyrite associated with quartz (AAWSE 10059) and iron-stained massive chalcopyrite (AAWSE 10060).
Latitude N 61° 33' 09.332"; Longitude W 143° 47' 19.801";
Elevation 2,825 ft.

Sample AAWSE 10059 contained 4,514 ppm Cu, 67.8 ppm Ag, and 17.75 ppm Au.

Sample AAWSE 10060 contained 2,872 ppm Cu, 316.2 ppm Ag, and 48.48 ppm Au.

Millsite

The mill building is mostly collapsed and still contains much of its milling equipment and engines. The mill is also the lower terminus of the aerial tramway, which has collapsed, leaving the cables strewn along its route to the upper station. There is one cabin that still has its roof, while all other buildings have either collapsed or are in the process of collapsing.
Latitude N 61° 33' 09.488"; Longitude W 143° 47' 19.200";
Elevation 2,835 ft.

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ALASKA KARDEX 87-014
ALASKA KARDEX 87-133

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Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 62-63.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

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BLACKBURN

MAS no: 0020870064 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Blackburn Group
Blackburn 1-3
Company name(s):
Alaska United Exploration Co.
Mineral survey(s):

Commodity: Copper, gold
Deposit type: Basaltic Cu

Location: At approximately the 3,650 ft. elevation on the west side of Porcupine Creek, a northern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 09
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1923 - Three tunnels driven (Moffit, 1918).

Operating data:
Blackburn group;
- Highest tunnel is 75 ft. long (Moffit and Mertie, 1923).
- Middle tunnel is caved (Moffit and Mertie, 1923).
- Lowest tunnel is 125 ft. long with two short branches (Moffit and Mertie, 1923).

Geologic setting:
Fine-grained basalt cut by dioritic dikes where both are shattered. A vertical fault strikes N. 25° E. Mineralization consists of pyrite and chalcopyrite and associated iron-staining (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

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BLUEBIRD

MAS no: 0020860139 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Bunker Hill
Forget-Me-Not
Montana Boy
Mountain Boy
Company name(s):
Mineral survey(s):

Commodity: Copper, gold
Deposit type: Basaltic Cu

Location: Located at the 5,050 ft. elevation on the east side of the Middle Fork Copper Creek, a southern tributary of the Kotsina River.

Township: 002 S. ***Range:*** 008 E. ***Section:*** 30
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1922 - Prospecting done (Moffit and Mertie, 1923).

Operating data:
Forget-Me-Not claim - one open cut (Moffit and Mertie, 1923)
Blue Bird claim - one open cut (Moffit and Mertie, 1923)
Montana/Mountain Boy claim - several open cuts and a short 10 ft. south trending tunnel (Moffit and Mertie 1923; Van Alstine and Black, 1946).
Bunker Hill group - a 15 ft. tunnel driven S. 10° E. (Moffit and Mertie, 1923; Van Alstine and Black, 1946)

Geologic setting:
Forget-Me-Not claim - Irregular fracture zone in greenstone with mineralization consisting of pyrite and minor bornite disseminated in the greenstone, with malachite coating the fractures (Van Alstine and Black, 1946).

Blue Bird claim - Greenstone cut by N. 45 to 65° W. vertical shear zones. Local malachite staining (Van Alstine and Black, 1946). Bornite and subordinate chalcopyrite deposited in small irregular veins intruded into the limestone and greenstone (Moffit and Mertie, 1923).

Montana/Mountain Boy claim - Greenstone bedrock crossed by a N. 48° W. vertical zone of fractures with copper mineralization. Bornite, the major mineral, with chalcocite found near the limestone-greenstone contact. Reported free gold panned from this claim (Moffit and Mertie, 1923; Van Alstine and Black, 1946).

Bunker Hill group - Greenstone thrust over Triassic shales. Greenstone shattered and mineralized with bornite, pyrite, and chalcopyrite. Malachite and azurite occur as secondary oxidation products (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located and sampled the Bluebird workings during 1997.

An open cut, or possible caved adit, cut into an extensively sheared and stained basalt. The sheared zone covers an area 60 by 20 ft. wide. Mineralization consists of massive chalcocite, azurite, and malachite. An ore stockpile contains at least 1 ton of "High Grade" material.

Latitude N 61° 39' 48"; Longitude W 144° 01' 54"; Elevation 5,050 ft.

Sample AAWSE 10044 collected of the "High Grade" ore from the stockpile contained 50.15% Cu and 103.6 ppm Ag.

An outcrop of basalt below the workings was a continuation of the shearing noted at the adit. Mineralization at this location consists of chalcopyrite.

Latitude N 61° 39' 48"; Longitude W 144° 01' 54"; Elevation 5,050 ft.

Sample AAWSE 10045 taken from the outcrop contained 6.4% Cu, 10.3 ppm Ag, and 32 ppb Au.

Resources:

BLM

At least 1 ton of material has been stockpiled below the workings and contains over 15% copper and 10.3 ppm silver.

References:

Bibliography:

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Cobb, E.H., and Kachadoorian, R., 1961, Index of metallic and nonmetallic mineral deposits of Alaska compiled from published reports of Federal and State agencies through 1959: U.S. Geological Survey Bulletin 1139, p. 330.

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Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 102.

BOYDEN

MAS no: 0020780101 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Kensky Disc.
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: At approximately the 4,000 ft. elevation along the north side of Skookum Creek, west of Devils Mountain Lodge.

Township: 007 N. ***Range:*** 013 E. ***Section:*** 09
Quadrangle: Nabesna B-5 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1958 - One placer claim staked by Henry Boyden (KX 78-054).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 78-054

CALCITE

MAS no: 0020870077 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Agnus MacDougall
Big Foot Creek
MacDougall Creek
Company name(s):
Chitina-Kuskulana Copper Co.
Mineral survey(s):

Commodity: Copper, iron
Deposit type: Carbonate-hosted Fe skarn

Location: Located at the 4,930 ft. elevation of the southeastern headwaters of MacDougall Creek (also named Bigfoot Creek), a southern tributary of the Kuskulana River.

Township: 004 S. ***Range:*** 009 E. ***Section:*** 02
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1900 - Staked at the same time as the War Eagle claims (KX 87-046b).
1919 - Development work done on a 600 ft. long adit (Moffit, 1921).

Operating data:
1919 - A 600 ft. long adit driven (Moffit, 1921).
- Hand steel, 6-hp. gasoline engine, blower, 600 ft. of air tubing for ventilation of the face (Moffit, 1921).

Geologic setting:
Most of MacDougall Creek is made up of granodiorite, but this mineralized area consists of Jurassic conglomerate, sandstone, and shale, Chitistone Limestone, and the overlying Triassic shales of the Kuskulana Formation (Moffit and Mertie, 1923).

Adit driven along the contact of a diorite mass on the north and silicified limestone on the south. Area disturbed by faulting, with the underlying Triassic limestone and shale being thrusted in a northerly direction over the younger Jurassic sediments. The fault strikes N. 75° W. and dips 25° N. to 30° S. and most likely played a part of the mineralization deposition (Moffit, 1921; Moffit and Mertie, 1923). White altered Chitistone Limestone in and surrounding the adit is highly fractured and sheared along the fracture planes which contain iron-stained gouge and laminated mineralization. Copper staining is abundant. Mineralization includes pyrite, copper-bearing pyrite, and chalcopyrite (Moffit, 1921).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located and sampled during 1997.

Adit open, driven S. 42° E. for 53 ft. where it has collapsed. At 29 ft. sloughing has occurred burying the tramrails and electric cables. Bedrock consists of chloritic limestone. Mineralization consists of disseminated pyrite and chalcopyrite.
Latitude N 61° 32' 48.777"; Longitude W 143° 43' 13.397"; Elevation 4,930 ft.

A sample (AAWSE 10068) of the mineralization collected from the waste dump contained 32 ppm Cu and 0.4 ppm Ag.

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Bibliography:

ALASKA KARDEX 87-046b

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Moffit, F. H., 1924, The metalliferous deposits of the Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1922: U.S. Geological Survey Bulletin 755, p. 65-66.

-----1938, Geology of the Chitina valley and adjacent area, Alaska: U.S. Geological Survey Bulletin 894, p. 117, 122-123, 126.

Van Alstine, R.E., and Black, R.F., 1946, Copper deposits of the Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 947-G, p. 139-140.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 42.

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CAMP CREEK

MAS no: 0020780011 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: Located approximately at the 6,100 ft. elevation of the headwaters of Camp Creek, a eastern tributary of the Nabesna River.

Township: 007 N. ***Range:*** 014 E. ***Section:*** 36
Quadrangle: Nabesna B-4 ***Meridian:*** Copper River
Mining District: Chisana ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:

1902 - Mineralization reported by Mr. Alfred B. Iles (Mendenhall and Schrader, 1902).
1907 - Staked by D.C. Sargent (KX 78-028).

Operating data:

None reported.

Geologic setting:

A 6 in. to 2 ft. wide vein in greenstone diabase, amygdaloidal basalt flows (MacKevett and Holloway, 1977), near its contact with the Nabesna limestone. Vein consists of chalcocite or copper glance (splendid luster), with little or no gangue (Mendenhall and Schrader, 1903).

Recent investigations:

USGS/USBM/BLM work:

USGS

- A sample of the vein was reported to yield 61% copper in 1903 (Mendenhall and Schrader, 1903).

BLM

- Looked for but not located in 1997.

  Unable to find the reported vein or any sign of workings. The valley walls were extremely steep and unstable. Mostly volcanics and cherts with disseminated pyrites. A massive pyrite boulder containing chalcopyrite found in a medial moraine on the west side of the valley was located and sampled. The boulder was heavily iron-stained and weathered. The sample (AAWSE 10028) contained 0.3 ppm Ag and 107 ppm Cu.

References:

Bibliography:

ALASKA KARDEX 78-028

Mendenhall, W.C., and Schrader, F.C., 1902, Copper deposits of the Mount Wrangell region, Alaska, *in* Emmons, S.F., and Hayes, C.W., Contributions to economic geology: U.S. Geological Survey Bulletin 213, p. 148.

-----1903, The mineral resources of the Mount Wrangell district, Alaska: U.S. Geological Survey Professional Paper 15, p. 39.

Brooks, A.H., 1906, The mining industry in 1906, *in* Brooks, A.H., and others, Report on progress of investigations of mineral resources of Alaska in 1906: U.S. Geological Survey Bulletin 314, p. 28.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 208.

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CAMP CREEK

MAS no: 0020780077 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: At approximately the 4,200 ft. elevation of Camp Creek, an eastern tributary of the Nabesna River.

Township: 007 N. ***Range:*** 014 E. ***Section:*** 25
Quadrangle: Nabesna B-4 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Raw prospect

Development and Geology:

History and production:
None reported.

Geologic setting:
Several phases of greenstone diabase are associated with the Nabesna limestone. Some appear to be favorable for copper mineralization. Only malachite staining on coarsely crystalline limestone has been observed in the moraine gravels. Other rocks in the moraine include a variegated or purple amygdaloidal diabase (Mendenhall and Schrader, 1903).

Operating data:
None reported.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.
Unable to find the reported vein or any sign of workings. The valley walls were extremely steep and unstable. Mostly volcanics and cherts with disseminated pyrites. A massive pyrite boulder containing chalcopyrite found in a medial moraine on the west side of the valley was located and sampled. The boulder was heavily iron-stained and weathered. The sample AAWSE 10028 contained 0.3 ppm Ag and 107 ppm Cu.

References:

Bibliography:
Mendenhall, W.C., and Schrader, F.C., 1903, The mineral resources of the Mount Wrangell district, Alaska: U.S. Geological Survey Professional Paper 15, p. 39.

Brooks, A.H., 1906, The mining industry in 1906, *in* Brooks, A.H., and others, Report on progress of investigations of mineral resources of Alaska in 1906: U.S. Geological Survey Bulletin 314, p. 28.

Richter, D.H., and Matson, N.A., Jr., 1969, Geochemical data from the Nabesna B-4 quadrangle, Alaska: U.S. Geological Survey Open-File Report 69-224 (366), 8 p.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 81.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected non-metalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 50.

CARIBOU CREEK MINE

MAS no: 0020780132 ***Figure no:*** 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):
Commodity: Gold
Deposit type: Placer
Patent number(s):

Location: Located at the 4,300 ft. elevation of the middle fork of Caribou Creek.

Township: 010 N. ***Range:*** 010 E. ***Section:*** 25
Quadrangle: Nabesna C-5 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer

Development and Geology:

History and production:
Unknown.

Operating data:
Hydraulic operation using a 3 in. hose and a 12 in. wide sluice ("Long Tom") of unknown length. A wing dam, with wooden gates, was built to control water flow in the stream and create a head for the hydraulic nozzle. The area worked covered approximately 1 to 1½ mile of the stream. Boulder piles have been placed on both sides of the creek in the areas worked. The workings are located between a cabin, used by hikers, upstream to an old tent site at the 4,450 ft. elevation.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located workings and collected two placer samples in 1997.
  Latitude N 62° 37' 01.375"; Longitude W 143° 27' 33.123"; Elevation 4,155 ft.
  Placer sample AAWSE 10014 collected from below eastern gully, taken of sloughed material. Float consisted of basalts, rhyolite and aplitic dikes. A 1/10 cubic yard sample was processed through a mini sluicebox. Recovered 2 small angular gold flakes (lenticular, approximately ½ mm). No quartz was noted in the stream float. Lab analysis showed the sample concentrates to contain 2,951 ppb Au, 0.6 ppm Ag, and 31 ppm Cu.
  Placer sample AAWSE 10015 taken from small gravel to boulders 16 in. in diameter. Float in the area consisted of basalts and rhyolites. A 1/10 cubic yard sample was processed through a mini sluicebox. Recovered 6 gold flakes from ½ mm to a speck. No quartz or garnets were noted in the stream float. Lab analysis showed the sample concentrates to contain 5,227 ppb Au, 0.4 ppm Ag, and 33 ppm Cu.

Resources:

Judging from the amount of area worked, it would suggest that most of the gold has already been mined out. There may be a potential to recover flood gold on a yearly basis, and a possibility of gold occurring further upstream, as well as downstream, from the existing workings. With modern equipment these areas may be minable, but more extensive sampling of the stream drainage needs to be completed.

References:

Bibliography:

None

CARIBOU CREEK PROSPECT

MAS no: 0020780003 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Unnamed occurrence
Company name(s):
Mineral survey(s):

Commodity: Copper, gold, lead, zinc
Deposit type: Granitoid-host Au

Location: Located at the 4,890 and 4,920 ft. elevations on the west side of the middle fork of Caribou Creek.

Township: 010 N. *Range:* 010 E. *Section:* 25
Quadrangle: Nabesna C-5 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:
1942 - Caved adit located (Moffit, 1954).

Operating data:
Caved adit driven N. 65° E. to crosscut the vein (Moffit, 1954).

Geologic setting:
Permian volcanic rocks. An 8 ft. thick trachyte dike striking N. 55° W., dipping 45° NE., cuts a diorite gneiss. Stringers made up of quartz, calcite, pyrite, galena, and sphalerite, from ¼ to 2 in. thick, form a 6 to 12 in. thick mineralized zone. Another trachyte dike, located across the creek, shows pyritization along the contact (Moffit, 1954).

Recent investigations:

USGS/USBM/BLM work:
USGS
- Site visit by Moffit (1954) in 1942. No analytical samples were collected.

BLM
- Located and sampled two caved adits in 1997.

No. 1 Adit

Adit caved at the portal, appeared to be driven N. 18° W. The workings appear to be following a rhyolitic dike containing disseminated pyrite and chalcopyrite mineralization. A zone of horndblendite was noted above the portal.
Latitude N 62° 37' 28.137"; Longitude W 143° 26' 59.860";
Elevation 4,920 ft.

Sample AAWSE 10006 collected of rhyolite and disseminated pyrite from the waste dump contained 2 ppm Cu.

Sample AAWSE 10007 collected from a 2 ft. wide iron-stained vein located on the upper right of the portal. Mineralization included disseminated pyrite and chalcopyrite. The sample contained 0.3 ppm Ag and 3.16 ppm Cu.

Sample AAWSE 10008 collected of apparent "High grade" chalcopyrite float above the adit contained 137 ppm Cu.

No. 2 Adit

Adit caved at the portal, located 150 ft. downstream from Adit No. 1. The adit appeared to be driven N. 48° E., with no visible mineralization or ore noted in the waste dump.
Latitude N 62° 37' 26.995"; Longitude W 143° 27' 02.084";
Elevation 4,890 ft.

No samples were collected, no visible mineralization noted.

References:

Bibliography:

Moffit, F.H., 1954, Geology of the eastern part of the Alaska range and adjacent area: U.S. Geological Survey Bulletin 989-D, p. 203.

Richter, D.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-422.

CARMALITA

MAS no: 0020870138 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: At approximately the 2,100 ft. elevation of Crystal Creek just upstream of the Lakina River, a northern tributary of the Chitina River.

Township: 006 S. ***Range:*** 010 E. ***Section:*** 13
Quadrangle: McCarthy B-7 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1975 - One claim staked by David Kesinger (KX 87-188).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for during 1997.

References:

Bibliography:
ALASKA KARDEX 87-188

CAVE PROSPECT

MAS no: 0020860192 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Company name(s):
Adolph Ammann
Mineral survey(s):

Commodity: Copper, silver
Deposit type: Basaltic Cu

Location: At approximately the 4,135 ft. elevation, southwest of the Mullen Prospect, on the west side of Copper Creek, a southern tributary of the Kotsina River.

Township: 002 S. *Range:* 007 E. *Section:* 25
Quadrangle: Valdez C-1 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:

1907 - Staked by Scott Simenstad and E.W. Hundley (KX 86-064).
1916 - Staked by Robert Jenkins (KX 86-148).
1944 - A 223 ft. long adit (Van Alstine and Black, 1946).

Operating data:

A 223 ft. long adit trending S. 88° W. (Van Alstine and Black, 1946).

Geologic setting:

Nikolai Greenstone overlain by Chitistone Limestone (strikes N. 40° W. and dips 25° SW.). A mineralized 2 to 12 in. thick shear zone contains sheared greenstone, quartz, malachite, bornite, and minor chalcopyrite. The zone strikes N. 14° W. and dips 7° W. (Van Alstine and Black, 1946).

Recent investigations:

USGS/USBM/BLM work:

BLM
- Located and sampled the adit during 1997.

Adit, driven N. 25° E., was open for 34 ft. and then partially flooded. The adit goes for another 30 to 50 ft., but was inaccessible due to the flooding. A shear zone located on the north rib of the adit, 10 ft. in from the portal, contained malachite and azurite bearing quartz.
Latitude N 61° 40' 18"; Longitude W 144° 04' 02"; Elevation 4,135 ft.
Sample AAWSE 10043 collected from the malachite and azurite bearing quartz shear zone contained 16.95% Cu, 30.6 ppm Ag, and 533 ppb Au.

References:

Bibliography:

ALASKA KARDEX 86-64 (Partial)
ALASKA KARDEX 86-148 (Partial)

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 103.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 102-103.

Van Alstine, R.E., and Black, R.F., 1946, Copper deposits of the Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 947-G, p. 129-130.

CHICHOKNA

MAS no: 0020860087 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Chichokna 1-15
Company name(s):
Alaska Yukon Minerals
Mineral survey(s):

Commodity: Gold
Deposit type: Polymetallic vein

Location: At approximately the 2,890 ft. elevation along the Chichokna River, a tributary of the Chetaslina River.

Township: 002 N. ***Range:*** 005 E. ***Section:*** 33
Quadrangle: Valdez D-2 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1968 - Fifteen claims staked by John J. Brennan (KX 78-160).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

A prominent stain-zone within a steep narrow canyon was observed along Chichokna River. The area was not looked at due to time constraints and accessibility. This maybe the actual location of the claims.

Two samples were collected from the ridge west of the river (AAWSE 10032-33).

Recommendations:
Return to the stain-zone along the river to look for signs of prospecting and collect samples for analysis.

References:

Bibliography:
ALASKA KARDEX 86-160

CHOKOSNA RIVER

MAS no: 0020870144 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Broken Leg Group
Mineral King Group
Company name(s):
Mt. Wrangell Copper Co.
Mineral survey(s):

Commodity: Copper
Deposit type: Unknown

Location: At approximately the 2,790 ft. elevation on the west side of a tributary of the Gilahina River.

Township: 005 S. *Range:* 010 E. *Section:* 09
Quadrangle: McCarthy B-8 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Exploration prospect

Development and Geology:

History and production:
1919 - Claims staked (KX 87-107).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located during 1997.

References:

Bibliography:
ALASKA KARDEX 87-107

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 64.

CLEAR CREEK MINE

MAS no: 0020870063 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Copper Mountain
Copper Mountain Group

Company name(s):
Great Northern Development Co.

Mineral survey(s):
M.S. 918

Commodity: Copper
Deposit type: Basaltic Cu

Patent number(s):
541521

Location: Located between the 4,300 and 5,585 ft. elevations on the east side of Clear Creek, a northern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 07
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer/Patented

Development and Geology:

History and production:

1906 - Fifty-eight claims staked (KX 87-040, KX 87-041)
- Prospecting started (Van Alstine and Black, 1946).

1907 - Claims staked from August 6, 1907 to March 20, 1910. Claims include the Alpha, Beta, Ophir, Berdena, Bertha, Cleo, Taft, Teddy, Ray, Borden, Madison, Cairo, Ramshorn, Chicken, Borinite[sic], Keno, Buck, Irwin, Togo, Kent, Anvil, Monroe, Clyde, Munro, Westover, Star, Lida, Alma, Ada, Nancy, Colorado, Butte, California, Idaho, Shamrock, Columbia, Ruth, May, Theo, Salem, Helena, Troy, Maud, Porcupine, Ethel, Alice, Blane, Cook-Ko, Arcansaw[sic], Venetia, Copper King, Copper Queen, Solomon, Eureka, Humboldt, Jessie, Pyrites, and Anaconda Lodes by the Great Northern Development Co.
- Claims recorded from September 16, 1907 to April 8, 1910.
- Prospecting and development work done (Moffit, 1909).

1908 - Prospecting and development work done (Moffit, 1909).

1910 - Mineral Survey 918 surveyed. Claims include those mentioned staked in 1907.

1911 - Development work done (Moffit, 1912).

1912 - Development work done, aerial tramway started. 5,000 ft. of tunneling has been completed and considerable ore blocked out (Moffit, 1913).
- Snowslide during the winter of 1912-13 destroyed much of the camp and workings including the generating plant as well as taking several lives (Moffit and Mertie, 1923).

1913 - Shipment of ore made (Brooks, 1914).

1914 - Assessment work done, development work suspended pending patent grants (Moffit, 1918).
- Three tunnels driven with a total length of 5,700 ft. and a fourth started (Moffit, 1918).

1915 - Assessment work only completed (Smith, 1917a).

1916 - Assessment work only completed (Smith, 1917b).
- Patented August 9, 35 claims (Moffit, 1918).

1922 - Development work done (Moffit, 1924).
1943 - All workings reported caved (Van Alstine and Black, 1946).

Production:
Shipment of ore made during the winter of 1912-13 (Brooks, 1914).

Operating data:
- In 1910 Mineral Survey 918 reported 2 main tunnels, with branches, crosscuts, underground work and winze, 1 tunnel, 2 open cuts, and 1 shaft.
- During 1912, 5,000 ft. of tunneling and considerable ore blocked (Moffit, 1912; Moffit, 1913).
- Aerial tramway began being built during 1912 to connect to projected railroad spur (Moffit, 1913).
- Three principle tunnels totaling 5,661 ft. and a fourth tunnel 175 ft. long (Moffit and Mertie, 1923).

Tunnel No. 1
Over 2,000 ft. of workings at the 5,000 ft. elevation. Two branches were driven, each 1,000 ft. long. Only east branch accessible in 1943 (Van Alstine and Black, 1946).

Tunnel No. 2
Located at the 5,500 ft. elevation. Tunnel driven N. 30 to 60° E. following fracture planes, a crosscut with a 2 ft. thick vein is located at 350 ft. Mineralization includes pyrite and chalcopyrite (Moffit and Mertie, 1923).

Tunnel No. 3
Driven 2,266 ft. at the 5,200 ft. elevation. Mineralization includes chalcopyrite and pyrite in a sheeted zone near the granodiorite contact trending the same as Tunnel No. 2 (Moffit and Mertie, 1923). By 1943 the tunnel was closed by ice 100 ft. beyond the portal (Van Alstine and Black, 1946).

Tunnel No. 4
Driven 174 ft. at the lowest point (4,200 ft. elevation) for use as the main working tunnel during mining (Moffit and Mertie, 1923). Completely caved by 1945 (Van Alstine and Black, 1946).

Geologic setting:
Clear Creek follows the boundary between the Chitistone Limestone and the Nikolai Greenstone, which dip steeply west-southwest (Moffit, 1918). Greenstone on the east side of the creek near the headwaters is intruded by a dark mass of mineralized porphyritic igneous rock (diorite). Ore minerals consist of chalcopyrite and cupriferous pyrite disseminated through both the intruded and intruding rocks. In places the mineralization fills minute veinlets, parallel to one another, which represent fractures in a shear zone. They also form larger veins along fracture planes, but generally, the ore is a low-grade disseminated deposit (Moffit, 1918).

Recent investigations:

USGS/USBM/BLM work:
USBM
- Site visit in 1977 (USBM field notes).

BLM

- Located and sampled in 1997

Tunnel No. 1 - Monroe Lode claim

Adit open, driven S. 85° E., total length unknown. The adit has a crosscut to the north approximately 50 ft. from the portal and two crosscuts, both driven about 50 ft, in the shape of a V at the end of the main adit. This adit contained candles strewn all over the floor the entire length of its workings. At the crosscuts there are stacks of candle boxes in both arms. At least 50 cases of candles were counted. Mineralization occurs in sheared iron-stained quartz veinlets and consists of chalcopyrite, minor bornite, and pyrite.
Latitude N 61° 37' 24.608"; Longitude W 143° 50' 24.448";
Elevation 5,035 ft.

Sample AAWSE 10054 collected of the mineralization from the waste dump contained 155 ppm Cu, 1.6 ppm Ag, and 285 ppb Au.

Opencut - Upper - Monroe Lode claim

Around the corner, to the southeast, and above Tunnel No. 1 an L-shaped open cut or sloughed-in shaft was located. Bedrock consists of highly iron-stained basalts with a 2 ft. wide shear zone trending N. 29° E. for at least 30 ft. Chalcopyrite mineralization occurs as disseminations and as veins up to 1 in. thick within the shear zone.
Latitude N 61° 37' 24.518"; Longitude W 143° 50' 19.761";
Elevation 5,125 ft.

Sample AAWSE 10055 collected of the mineralized shear from the open cut contained 4,978 ppm Cu, over 10% Fe, 4.6 ppm Ag, and 9,828 ppb Au.

Tunnel No. 2 - Copper King Lode claim

Adit caved at portal, appeared to be driven S. 87° E. into a 20 ft. wide shear zone in the basalt. Mineralization occurs as either massive chalcopyrite (AAWSE 10056) or malachite and disseminated chalcopyrite in basalt (AAWSE 10057).
Latitude N 61° 37' 50.057"; Longitude W 143° 50' 50.595";
Elevation 5,585 ft.

Sample AAWSE 10056 collected of the massive chalcopyrite collected from the waste dump contained 8.8% Cu, 66.3 ppm Ag, 8,000 ppb Ag, over 10% Fe, and 1,208 ppm Zn.

Sample AAWSE 10057 collected of the malachite and disseminated chalcopyrite in basalt contained 2.9% Cu, 9.4 ppm Ag, 665 ppb Au, and 1,329 ppm Mn.

Tunnel No. 3 - Copper Queen Lode claim

Adit was completely iced in at 20 ft., driven N. 90° E.
Latitude N 61° 37' 41.604"; Longitude W 143° 50' 57.967";
Elevation 5,140 ft.

No samples collected. No mineralization was noted in the waste dump or surrounding area.

Opencut - Lower - Copper Queen Lode or the Pyrites Lode claim

An open cut 15 x 15 x 6 ft. deep cut into the basalt exposed a 2 in. wide iron-stained shear zone containing veinlets and disseminated pyrite and chalcopyrite.
Latitude N 61° 37' 38.869"; Longitude W 143° 50' 58.226";
Elevation 5,095 ft.

Sample AAWSE 10058 collected from the shear contained 210 ppm Cu, over 10% Fe, 162 ppb Ag, 952 ppm Zn, and less than 0.2 ppm Ag.

Tunnel No. 4 - Alpha or Beta Lode claim
Adit caved at portal, appeared to be driven N. 90° E.
Latitude N 61° 36' 58.588"; Longitude W 143° 50' 22.623";
Elevation 4,300 ft.
No samples collected. No mineralization noted in the waste dump.

Camp - Copper Queen Lode claim
All buildings were collapsed due to snowslide.
Latitude N 61° 37' 32"; Longitude W 143° 50' 46"; Elevation 4,910 ft.

Generating plant
All buildings collapsed. Remnants of engine at site.
Latitude N 61° 36' 52"; Longitude W 143° 50' 34"; Elevation 4,120 ft.

References:

Bibliography:

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ALASKA KARDEX 87-041

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-----1917, The mining industry in the Territory of Alaska during the calendar year 1916: U.S. Bureau of Mines Bulletin 153, p. 30.

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-----1938, Geology of the Chitina valley and adjacent area, Alaska: U.S. Geological Survey Bulletin 894, p. 123.

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COPPER KING MINE

MAS no: 0020860140 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Mineral King
Swazie

Company name(s):
Elliott Hubbard Mining Co.
Hubbard-Elliott Copper Mines Development Co. of Alaska
Mineral King Mining Co.

Mineral survey(s):
M.S. 565 through 566
M.S. 630 through 632 (632 included in M.S. 658)
M.S. 658 through 659
M.S. 660A&B through 662A&B
M.S. 663
M.S. 664 (Not filed)
M.S. 665A&B

Commodity: Gold, copper
Deposit type: Basaltic Cu

Location: Located at the 4,705 ft. elevation near the headwaters of Elliott Creek on the south side of the creek. Elliott Creek is a tributary of the Kotsina River.

Township: 003 S. ***Range:*** 008 E. ***Section:*** 06
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer/Patented

Development and Geology:

History and production:

1899 - Fifty-six claims staked by H.C. Elliott, Charles Hubbard, Bertha Huntley, John Fay, and Helen H. Nickolson (KX 86-050).
- Eighy-four claims staked by H.C. Elliott and Charles Hubbard (KX 86-051).

1900 - Copper King, Louise, Goodyear, Henry Prather, Lizzie G, Mineral King, Rainbow, and Nancy Hanks claims located, August 26, by Charles G. Hubbard, George J. Roberts, P.J. Boardman, Ernest Brundett, Henry P. Elliott, and Antoinette Elliott.
- Claims recorded September 27.

1901 - Elizabeth Lode located, July 16, by the Hubbard-Elliott Copper Mines Development Co. of Alaska.
- Guthrie and Albert Johnston Lodes located, July 17, by the Hubbard-Elliott Copper Mines Development Co. of Alaska.
- Claims recorded October 11.

1902 - Mineral Survey 566 surveyed, June 26-July 4 for Charles G. Hubbard, George J. Roberts, P.J. Boardman, Ernest Brundett, Henry P. Elliott, and Antoinette Elliott. Claims include the Copper King and Mineral King Lodes.
- Mineral Survey 565 surveyed, July 5-19, for Charles G. Hubbard, George J. Roberts, P.J. Boardman, Ernest Brundett, Henry P. Elliott, and Antoinette Elliott. Claims include the Louise, Goodyear, Henry Prather, Lizzie G, Rainbow, and Nancy Hanks Lodes.

1904 - Mineral Survey 630 surveyed, August 3-12, for the Hubbard-Elliott Copper Mines, Development Co. of Alaska. Claims include the Guthrie and Albert Johnston Lodes.
- Mineral Survey 631 surveyed, August 5-6, for the Hubbard-Elliott Copper Mines, Development Co. of Alaska.
- Copper Queen, Fortuna, Regina, Van-Dyck, Kotsina, Katherine, Frisco, California, Gloriana, Marmot, Samolean, Flanders, Castle, Retriever, Glendive, Sweepstakes, Babe, Wrangell, Cliff, Cave, Lime-Gulch, Chance, Lawton, Leland, Ralph J., Unalita, Curtis, Red Jacket, El Capitan, Senator, Marie Antoinette, and the Ophir Lodes along with the Castle, Cliff, Lawton, and El Capitan Millsites located, August 10, for the Hubbard-Elliott Copper Mines Development Co. of Alaska.
- Claims recorded September 14.

1905 - Mineral Survey 658 surveyed, August 19-22, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Copper Queen, Fortuna, Regina, Van-Dyck, Kotsina, Katherine, Frisco, California, and Gloriana Lodes.
- Mineral Survey 659 surveyed, August 27-28, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Marmot, Samolean, and Flanders Lodes.
- Mineral Survey 660 A and B surveyed, August 28-30, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Castle, Retriever, Glendive, Sweepstakes, Babe, and Wrangell Lodes and the Castle Millsite.
- Mineral Survey 661 A and B surveyed, August 23-25, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Cliff, Cave, Lime-Gulch, and Chance Lodes and the Cliff Millsite.
- Mineral Survey 662 A and B surveyed, August 26, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Lawton and Leland Lodes and the Lawton Millsite.
- Mineral Survey 663 surveyed, August 31, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claim includes the Ralph J. Lode.
- Mineral Survey 665 A and B surveyed, September 1-4, for the Hubbard-Elliott Copper Mines Development Co. of Alaska. Claims include the Unalita, Curtis, Red Jacket, El Capitan, Senator, Marie Antoinette, and the Ophir Lodes and the El Capitan Millsite.

1923 - Two small open cuts (Moffit and Knopf, 1910).

Operating data:

1902 - Mineral Survey 565 reported 4 discovery cuts and 4 open cuts.
- Mineral Survey 566 reported a discovery cut and an open cut.

1904 - Mineral Survey 630 reported 2 discovery cuts and 2 tunnels.
- Mineral Survey 631 reported 1 discovery cut , 51 ft. wide and a 14 ft. face on the Elizabeth Lode.

1905 - Mineral Survey 658 reported 15 open cuts.
- Mineral Survey 659 reported 3 open cuts.
- Mineral Survey 660 A and B reported 11 open cuts.
- Mineral Survey 661 A and B reported 7 open cuts.
- Mineral Survey 662 A and B reported 4 open cuts.
- Mineral Survey 663 reported 2 open cuts.
- Mineral Survey 665 A and B reported 13 open cuts and 2 tunnels.

Copper Creek claim - a open cut.

Mineral King claim - several open cuts.

Geologic setting:

Stratiform carboniferous basalts intercalated with beds of breccia and brick-red tuffs, striking N. 85° E. dipping 18° N. Native copper limited to a locally amygdaloidal reddish lava and can be traced for 200 ft. (Moffit and Knopf, 1910).

Copper King claim - Mixture of bornite and chalcocite along a shear zone. Minor pyrite, malachite, and chalcanthite (blue glass) are located along the zone. The shear zone runs east-northeast parallel to the limestone bluffs and dips southward (Moffit and Mertie, 1923).

Mineral King claim - Shear zone, striking N. 35° E., dipping 30° S., showing a number of faults. Vertical joints, striking N. 60° E., and by faults that dip 30° SE., cross the greenstone. Mineralization consists of a mixture of bornite and chalcocite replacing greenstone, particularly along the joint and fracture planes. The mineralized rock ranges up to 6 ft. wide and can be traced up to 30 ft. (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located 1 adit within Ahtna, Inc selections and collected 1 sample during 1997.

Mineral King Lode

Located an adit that was snow covered and iced in at the portal. The adit appeared to be driven S. 88° E. Mineralization consisted of malachite, azurite, massive chalcocite, bornite, and chalcopyrite.

Latitude N 61° 38' 12"; Longitude W 144° 02' 03"; Elevation 4,705 ft.

Sample AAWSE 10063 of the mineralization collected from the waste dump contained 13.4% Cu, 17.2 ppm Ag, 16 ppb Au, and 1,105 ppm Mn.

Camp

All buildings, but one, are collapsed at the camp in the valley. Remnants of engine and collapsed building with an engine is located just below adit.

References:

Bibliography:

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ALASKA KARDEX 86-051

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COPPER QUEEN

MAS no: 0020870070 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Rarus Group
Company name(s):
Alaska Consolidated Copper Co.
Mt. Wrangell Copper Co.
Mineral survey(s):

Commodity: Copper, iron
Deposit type: Carbonate-hosted Fe skarn

Location: Located at the 3,325 ft. elevation west of Berg Creek and east of MacDougall Creek, tributaries of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 34
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
19?? - Claims staked by the Alaska Consolidated Copper Co. (Moffit, 1918).
1912 - Exploration work done (Moffit, 1913).
1914 - Exploration work done (Moffit, 1918).
1915 - Claims dropped by the Alaska Consolidated Copper Co. (Moffit, 1918).
1916 - Claims restaked (Moffit, 1918) by the Wrangell Copper Co. (Moffit, 1921, KX 87-044).

Operating data:
1914 - Over 400 ft. long tunnel driven (Moffit, 1915).
1916 - A 433 ft. long tunnel (Moffit, 1918) trending S. 15° E. (Moffit and Mertie, 1923).

Geologic setting:
Bedrock consists of silicified Chitistone Limestone, a dark porphyritic rock containing large crystals of hornblende, and a mineralized sandstone. Igneous rock sheared and contains a large amount of magnetite, pyrite, and chalcopyrite (Moffit, 1915).

Recent investigations:

USGS/USBM/BLM work:
USBM
- Site visit in 1977 (USBM field notes).

BLM
- Located and sampled during 1997.

Adit caved at the portal. Bedrock consists of highly iron-stained sheared basalt containing disseminated pyrite and chalcopyrite.
Latitude N 61° 33' 31.285"; Longitude W 143° 45' 27.753"; Elevation 3,325 ft.
Sample AAWSE 10062 of the mineralization collected from the waste dump contained 3,891 ppm Cu, 5.0 ppm Ag, and 542 ppb Au.

References:

Bibliography:

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CORUNDUM

MAS no: 0020780083 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Corundum # I
Company name(s):
Mineral survey(s):

Commodity: Corundum
Deposit type: Pegmatite

Location: At approximately the 5,300 to 5,500 ft. elevation on the west side of Little Jack Creek, east of Rock Creek.

Township: 010 N. *Range:* 011 E. *Section:* 33
Quadrangle: Nabesna C-5 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Exploration prospect

Development and Geology:

History and production:
1964 - First reported by Ray Gatz (Richter, 1970).
1968 - One claim staked by R.J. McGrane (KX 78-073).

Operating data:
None reported.

Geologic setting:
Crystals of gray corundum occur in alkali pegmatite dikes, less than 3 ft. wide, cutting a syenite-monzonite gneiss which is part of a meta-igneous complex consisting of diorite and diorite gneiss. The corundum has been recognized in three dikes and is associated with muscovite (Richter, 1970).

Recent investigations:

USGS/USBM/BLM work:
USGS
- Brief visit in 1967.
- Brief visit in 1968.
- Detailed examination in 1969 of the property by Donald Richter (Richter, 1970).

BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 78-073

Richter, D.H., 1970, A corundum occurrence in the eastern Alaska Range, Alaska: U.S. Geological Survey Professional Paper 700-C, p. C98-C102.

Matson, N.A., Jr., and Richter, D.H., 1971, Geochemical data from the Nabesna C-5 quadrangle, Alaska: U.S. Geological Survey Open-File Report 473 (71-204), p. 10.

CRAWFORD

MAS no: 0020860125 ***Figure no.*** 3

Ownership and Location

Alternate name(s):
Bet[ween]. Copper
Crawfords Nos. 1-3
Shale Creek
Company name(s):
Mineral survey(s):

Commodity: Uranium
Deposit type: Polymetallic vein

Location: At approximately the 5,000 ft. elevation on the north side of Sheep Mtn., east of Sheep Creek, a southern tributary of the Kotsina River.

Township: 002 S. ***Range:*** 007 E. ***Section:*** 23
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1955 - Fourteen claims staked by C.C. Cechowski (KX 86-028).
- Six claims staked by Roland Wainer (KX 86-029).
- Three claims staked by Ben Crawford (KX 86-030).
- Three claims staked by Richard Kennard (KX 86-031).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 86-028
ALASKA KARDEX 86-029
ALASKA KARDEX 86-030
ALASKA KARDEX 86-031

DOTTIE

MAS no: 0020860127 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Dottie and Danny
Hjalmer Nos. 1-2
Johnson Nos. 1-4
Left Limit Kotsina River
Right Limit Copper Creek
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: At approximately the 2,100 ft. elevation of the northern braid of the Kotsina River near the mouth of Copper Creek.

Township: 002 S. ***Range:*** 007 E. ***Section:*** 13
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology

History and production:
1955 - Two claims staked by Mark Kennard (KX 86-032).
- Two claims staked by Vern Johnson (KX 86-033).
- Two claims staked by Pauline Johnson (KX 86-034).
- Two claims staked by Roland Wainer (KX 86-035).
- Two claims staked by C.C. Cechowski (KX 86-036).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for during 1997.

References:

Bibliography:
ALASKA KARDEX 86-032
ALASKA KARDEX 86-033
ALASKA KARDEX 86-034

ALASKA KARDEX 86-035
ALASKA KARDEX 86-036

ESCAPE

MAS no: 0020870078 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Escape 1-3
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: At approximately the 1,480 ft. elevation of the Chokosna River upstream from the community of Chokosna.

Township: 005 S. ***Range:*** 009 E. ***Section:*** 10
Quadrangle: McCarthy B-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1971 - Three claims staked by Don Shepard (KX 87-158).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for during 1997.

References:

Bibliography:
ALASKA KARDEX 87-158

FALL CREEK

MAS no: 0020870015 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Flim Flam Gulch
Flimflam Gulch
Homestake
Newhome
Sunrise
Sunset
Trail Creek
Company name(s):
Mineral survey(s):

Commodity: Copper, gold, silver
Deposit type: Basaltic Cu

Location: Located between the 4,280 and 4,480 ft. elevations of Flimflam Gulch and Trail Creek on the north side of Scotty Peak. These are western tributaries of Fall Creek, a northwestern tributary of the Kluvesna River.

Township: 001 S. *Range:* 008 E. *Section:* 10
Quadrangle: McCarthy D-8 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:

1907 - Staked by Adolph Ammann and Jack Nafsted (KX 87-032).
- Prospecting and development work done (Moffit and Maddren 1908; Moffit and Maddren, 1909).

Operating data:

Homestake claim - One short tunnel (Moffit and Mertie, 1923).
Newhome claim - One short tunnel and several open cuts (Moffit and Mertie, 1923).
Sunrise claim - One short tunnel (Moffit and Mertie, 1923).
Sunset claim- One short tunnel (Moffit and Mertie, 1923).

Geologic setting:

Homestake claim - Vertical fault in Nikolai Greenstone stained with malachite. Native copper exposed 25 ft. above the tunnel mouth. Greenstones also contain chalcocite and the black carbonaceous copper-bearing substance (Moffit and Mertie, 1923).

Newhome claim - Nikolai Greenstone fractured and veined with quartz containing bornite and chalcopyrite (Moffit and Mertie, 1923).

Sunrise claim - Vertical north-south fault in amygdaloidal Nikolai Greenstone cut by small light-colored fine-grained porphyritic dikes and quartz veins containing bornite. Native copper is present in outcrop (Moffit and Mertie, 1923).

Sunset claim - Small fractured veins of quartz and calcite along a north-south fault within amygdaloidal Nikolai Greenstone. Malachite stains the surface exposures of the greenstone with azurite and malachite present in fractures. Cuprite is also present as well as a black carbonaceous

copper-bearing material between the blocks of greenstone (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located and sampled the Homestake and Newhome adits during 1997.

Homestake Adit

Adit open, driven S. 75° E., for 83 ft. Two crosscuts were located, one at 40 ft. driven west for 15 ft. and one at 55 ft. driven east for 30 ft. Bedrock consists of basaltic tuff containing native copper. Mineralization consists of malachite, native copper, bornite, and chalcopyrite. The adit was driven into a zone of mineralized basaltic tuff covering an area 50 ft. high and 100 ft. wide.
Latitude N 61° 47' 32"; Longitude W 143° 56' 04"; Elevation 4,480 ft.

Sample AAWSE 10038 of mineralization collected from the waste dump contained 2.9% Cu, 8.5 ppm Au, and 6 ppb Au.

Newhome Adit

Adit open, driven N. 70° E. for 35 ft. At 28 ft. adit cut across a 6 in. wide shear with quartz veins 1/8 in. thick. Minor quartz veins at face but no visible mineralization noted. Mineralization consisted of malachite, azurite, and bornite associated with quartz.
Latitude N 61° 47' 30"; Longitude W 143° 55' 51"; Elevation 4,440 ft.

Sample AAWSE 10037 of mineralization collected from the waste dump contained 5,354 ppm Cu, 7.4 ppm Au, and 8 ppb Au.

- Looked for but could not locate the Sunrise and Sunset workings.

Sunrise Adit

Located on the south side of Trail Creek.
Estimated location:
Latitude N 61° 47' 34"; Longitude W 143° 56' 14"; Elevation 4,310 ft.

Sunset Adit

Located on Flimflam Gulch.
Estimated location:
Latitude N 61° 47' 50"; Longitude W 143° 55' 38"; Elevation 4,280 ft.

References:

Bibliography:

ALASKA KARDEX 87-032

Mendenhall, W.C., and Schrader, F.C., 1903, The mineral resources of the Mount Wrangell district, Alaska: U.S. Geological Survey Professional Paper 15, p. 21.

Mendenhall, W.C., 1905, Geology of the central Copper River region, Alaska: U.S. Geological Survey Professional Paper 41, p. 97.

Moffit, F.H., and Maddren, A.G., 1908, The mineral resources of the Kotsina and Chitina valleys, Copper River region, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1907: U.S. Geological Survey Bulletin 345, p. 142-143.

-----1909, Mineral resources of the Kotsina-Chitina region, Alaska: U.S. Geological Survey Bulletin 374, p. 60-61.

Moffit, F.H., and Knopf, A., 1910, Mineral resources of the Nabesna-White River district, Alaska, with a section on the Quaternary, by S.R. Capps: U.S. Geological Survey Bulletin 417, 64 p.

Moffit, F.H., 1915, Mineral deposits of the Kotsina-Kuskulana district, with notes on mining in Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1914: U.S. Geological Survey Bulletin 622, p. 109.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 113-114.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 67.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

FALLS CREEK

MAS no: 0020860105 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Canyon Creek
Divide Creek
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: Located at the 4,695 ft. elevation on the south side of Falls Creek cirque. Falls Creek is a northern tributary of Canyon Creek.

Township: 006 S. ***Range:*** 006 E. ***Section:*** 11
Quadrangle: Valdez B-1 ***Meridian:*** Copper River
Mining district: Nizina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1911 - One open-cut and two tunnels driven on south side of Falls Creek (Moffit, 1914).

Operating data:
Two tunnels, 105 ft. and 150 ft. long, one open cut (Moffit, 1914).

Geologic setting:
Fractured Skolai Greenstone associated with altered sedimentary beds which include slate, schist, and highly siliceous thin-bedded limestone. Ore mineralization includes disseminated bornite, covellite, and chalcopyrite in the greenstone (Moffit, 1914).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located two adits and sampled one during 1997. Also noted a third adit but did not have the opportunity to obtain a GPS reading or sample the workings.

No. 1 Adit

Adit 149 ft. long, driven S. 80° E. for 29 ft. then S. 32° E. for 120 ft. A crosscut driven 15 ft. north is located 65 ft. from the portal. A shear zone at the portal extends at least 100 ft. at a 45° angle to the left.
Latitude N 61° 21' 14"; Longitude W 144° 15' 39"; Elevation 4,695 ft.
Sample AAWSE 10064 collected from the waste dump consisted of malachite, azurite, chalcopyrite, and bornite. The sample contained 6.2% Cu, 6.2 ppm Ag, and 329 ppb Au.

No. 2 Adit

Length unknown.
Estimated location:

Latitude N 61° 21' 20"; Longitude W 144° 16' 06"; Elevation 4,580 ft.
This adit was not located on the ground or sampled.

No. 3 Adit

Adit driven N. 20° E. for 10 ft., was located on north side of drainage. The adit was driven into limestone and greenschist.
Latitude N 61° 21' 30"; Longitude W 144° 15' 40"; Elevation 4,710 ft.
No samples were collected, no mineralization noted in the waste dump or surrounding area.

Mineralized boulders

A mineralized boulder located northeast from Adit No. 1 was deposited in the cirque. This boulder along with at least four others were derived from a shear zone located upvalley from the No. 1 Adit.
Latitude N 61° 21' 16"; Longitude W 144° 15' 32"; Elevation 4,560 ft.
Sample AAWSE 10065 was collected of malachite, azurite, and iron-stained quartz containing disseminated pyrite and chalcopyrite. The sample contained 1,733 ppm Cu, 0.5 ppm Ag, and 22 ppb Au.

Camp

All the camp buildings in the lower part of the cirque are collapsed.

References:

Bibliography:

ALASKA KARDEX 86-135
ALASKA KARDEX 86-137

Moffit, F.H., 1912, The Taral and Bremner River districts, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1911: U.S. Geological Survey Bulletin 520, p. 102-103.

-----1914, Geology of the Hanagita-Bremner region, Alaska: U.S. Geological Survey Bulletin 576, p. 52.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 62-63.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 103.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected non-metalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 81.

Cobb, E.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Valdez quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-438, no. 60.

Winkler, G.R., Miller, R.J., MacKevett, E.M., Jr., and Holloway, C.D., 1981, Map and summary table describing mineral deposits in the Valdez quadrangle, southern Alaska: U.S. Geological Survey Open-File Report 80-892-B, no. 50.

FENNIMORE & RASMUSSEN

MAS no: 0020780111 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Skyline
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Patent number(s):

Location: At approximately the 4,200 ft. elevation on the east side of Rock Creek.

Township: 009 N. ***Range:*** 011 E. ***Section:*** 04
Quadrangle: Nabesna C-5 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Raw prospect

Development and Geology:

History and production:
1968 - One claim staked by Fennimore and Rasmussen (KX 78-071).

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 78-071

Matson, N.A., Jr., and Richter, D.H., 1971, Geochemical data from the Nabesna C-5 quadrangle, Alaska: U.S. Geological Survey Open-File Report 473 (71-204), p. 10.

GOOD ENOUGH

MAS no: 0020870046 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Good Enough Group
Company name(s):
Kotsina Mining Co.
Mineral survey(s):

Commodity: Copper, silver
Deposit type: Basaltic Cu

Location: At approximately the 4,000 ft. elevation on the southeast side of Scotty Peak, along an unnamed tributary of the Kluvesna River.

Township: 001 S. ***Range:*** 008 E. ***Section:*** 22
Quadrangle: McCarthy D-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1907 - Staked by Adolph Ammann and Jack Nafsted (KX 87-032).

Operating data:
Two tunnels;
- The older and longer tunnel, located on the northeast side of a deep gulch, driven 70 ft. in a northwesterly direction trough fractured greenstones. Includes one crosscut. Workings caved (Moffit and Mertie, 1923).
- The newer and shorter tunnel, started on the south side of the gulch (Moffit and Mertie, 1923).

Geologic setting:
Boundary of the Nikolai Greenstone and underlying Strelna Formation. Bedrock made up of faulted and fractured fine-grained basalt and tuff with native copper and chalcocite associated with quartz and calcite veins. Cuprite, malachite, and azurite are also present in small quantities. Minerals form amygdules and replace greenstone (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

Bibliography:
ALASKA KARDEX 87-032

Moffit, F.H., and Maddren, A.G., 1908, The mineral resources of the Kotsina and Chitina valleys, Copper River region, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1907: U.S. Geological Survey Bulletin 345, p. 143.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 112-113.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 68.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected nonmetalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 36.

HIDDEN TREASURE

MAS no: 0020870045 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Fall Creek
Company name(s):
Mineral survey(s):

Commodity: Copper, gold, silver
Deposit type: Basaltic Cu

Location: At approximately the 5,300 ft. elevation on the east side of Fall Creek, a northern tributary of Kluvesna Creek.

Township: 001 S. *Range:* 008 E. *Section:* 12
Quadrangle: McCarthy D-8 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:
1907 - Staked by Adolph Ammann and Jack Nafsted (KX 87-032).

Operating data:
Several open cuts and a tunnel (Moffit and Mertie, 1923).

Geologic setting:
Small fracture veins of quartz and calcite along a north-south fault within amygdaloidal Nikolai Greenstone. Bornite and chalcocite occur at the south end of the claim, chalcocite and native copper occur at the north end of the claim, and between are chalcocite and native copper in quartz. The tunnel sits on the south end (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for during 1997. The adit was not located but two open cuts in the cirque were located and one sampled.
- Several cairns were noted on the ridge line southwest of the 6,050 ft. arete.

Lower opencut

Opencut 5 ft. wide, 20 ft. long, and 5 ft. deep. Bedrock consists of a vesicular basalt. Mineralization consisted of malachite and bornite.
Latitude N 61° 48' 00"; Longitude W 143° 53' 04"; Elevation 5,620 ft.
Sample AAWSE 10052 of the mineralization taken from the waste dump contained 3.3% Cu, 3.0 ppm Ag, and 12 ppb Au.

Upper open cut

Opencut 5 ft. wide, 10 ft. long, and 2 ft. deep.
No sample collected, no visible mineralization noted.

References:

Bibliography:
ALASKA KARDEX 87-032

Mendenhall, W.C., and Schrader, F.C., 1903, The mineral resources of the Mount Wrangell district, Alaska: U.S. Geological Survey Professional Paper 15, p. 21.

Mendenhall, W.C., 1905, Geology of the central Copper River region, Alaska: U.S. Geological Survey Professional Paper 41, p. 97.

Moffit, F.H., and Maddren, A.G., 1908, The mineral resources of the Kotsina and Chitina valleys, Copper River region, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1907: U.S. Geological Survey Bulletin 345, p. 142-144.

-----1909, Mineral resources of the Kotsina-Chitina region, Alaska: U.S. Geological Survey Bulletin 374, p. 60-61.

Moffit, F.H., and Knopf, A., 1910, Mineral resources of the Nabesna-White River district, Alaska, with a section on the Quaternary, by S.R. Capps: U.S. Geological Survey Bulletin 417, 64 p.

Moffit, F.H., 1915, Mineral deposits of the Kotsina-Kuskulana district, with notes on mining in Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1914: U.S. Geological Survey Bulletin 622, p. 109.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 113-114.

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MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected nonmetalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 36.

KINNEY-GOLDEN

MAS no: 0020870074 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Golden Creek
Kinney Golden 1-7
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Carbonate-hosted Fe skarn?

Location: At approximately the 4,200 ft. elevation between two tributaries of the Chokosna River, south of Kuskulana Pass.

Township: 004 S. ***Range:*** 010 E. ***Section:*** 20
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1900 - Seven claims staked (KX 87-053).
1916 - Development work done (Moffit, 1918).

Operating data:
1916 - A 200 ft. long tunnel at the 4,200 ft. elevation and several open cuts (Moffit, 1918).

Geologic setting:
Contact of interbedded Triassic shale and limestone with Carbonaceous (?) lava flows. Two parallel faults striking east and dipping south, 500 ft. apart, brought the shale into contact with the Nikolai Greenstone and Chitistone Limestone. Mineralization includes chalcopyrite along the greenstone-limestone contact (Moffit, 1918).
No ore body was discovered at this location (Berg and Cobb, 1967).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located during 1997.

References:

Bibliography:
ALASKA KARDEX 87-053

Moffit, F.H., 1918, Mining in the lower Copper River basin, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1916: U.S. Geological Survey Bulletin 662, p. 160-161.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 46.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 70.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected nonmetalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 33.

KOTSINA RIVER

MAS no: 0020870054 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Hartman
T. Larson
Company name(s):
Great Northern Development Co.
Captain Hartman and Associates
Mineral survey(s):

Commodity: Copper
Deposit type: Unknown

Location: At approximately the 2,700 ft. elevation on the south side of the Kotsina River between Rock Creek and Roaring Creek. Approximately ½ mile west of the Great Northern Development Co. office located on Roaring Creek.

Township: 002 S. ***Range:*** 009 E. ***Section:*** 06
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:

1907 - Claims staked by the Great Northern Development Co. and by Captain Hartman and Associates (KX 87- 034, KX 87-35).
- Prospecting and development work done, five short tunnels started (Moffit and Maddren, 1908).

1908 - Prospecting and development work done, tunnels extended (Moffit, 1909).
1909 - Prospecting and development work done (Moffit, 1910).
1914 - Development work and assessment work completed (Moffit, 1915).
1922 - Great Northern Development Co. have given up the claims (Moffit and Mertie, 1923).

Operating data:

Five short tunnels, none driven more than 20 ft. by 1907 (Moffit and Maddren, 1908).

Geologic setting:

Bedrock consists of Nikolai Greenstone. At the first adit a 10 ft. thick porphyritic dike cuts the fine-grained greenstones. The dike strikes N. 30° W., dips 80° W., and bounded by fault planes. Mineralization consists of copper-bearing pyrite. The second adit contains a 4 to 6 in. thick quartz vein containing a little copper pyrite. This vein strikes N. 50° W. and cuts the greenstone. The other three adits contain pyrite in the greenstone with a oxidized brown stain (Moffit and Maddren, 1908).

Recent investigations:

USGS/USBM/BLM work:

BLM
- Looked for but not located in 1997.

Estimated location:
Latitude N 61° 43' 02"; Longitude W 143° 51' 29"; Elevation 2,700 ft.

References:

Bibliography:

ALASKA KARDEX 87-034
ALASKA KARDEX 87-035

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LARSON

MAS no: 0020870056 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Larson Claim
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: The Larson property consists of two adits. The Larson East adit is located at the 4,880 ft. elevation on the east side of the cirque west of Amy Creek. The Larson West adit is located at the 4,800 ft. elevation on the west side of the same cirque. Amy Creek is a southern tributary of the Kotsina River between Rock Creek and Roaring Creek.

Township: 002 S. ***Range:*** 008 E. ***Section:*** 12
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1900 - Claims staked by Thomas Larson (KX 87-039).
1922 - Development work done (Moffit and Mertie, 1923).

Operating data:
Two tunnels (Moffit and Mertie, 1923).

Geologic setting:
Amygdaloidal Nikolai Greenstone filled with quartz amygdules cut by veins and lenses of the same material. A fracture zone and the surrounding rock is stained with malachite. The zone has been traced for several hundred feet (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located two adits but only able to sample one during 1997.

Larson East

Adit located on the east side of the cirque. Driven N. 5° W. for 35 ft. and then eastward for another 55 ft. A wheelbarrow containing 1 case and 1 stick of dynamite is located in the middle of the adit at 55 ft. from the portal. Bedrock consists of basalt, slightly iron-stained, containing disseminated pyrite.
Latitude N 61° 42' 08"; Longitude W 143° 51' 46"; Elevation 4,880 ft.
Sample AAWSE 10051 of the mineralization collected from the waste dump contained 188 ppm Cu and less than 0.2 ppm Ag.

Larson West

Caved adit located on the west side of the cirque. The adit was not visited

during 1997.
Estimated location:
Latitude N 61° 42' 08"; Longitude W 143° 52' 38"; Elevation 4,800 ft.

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LIME CREEK

MAS no: 0020870080 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Bird Larsen
G & B
United Verde
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: At approximately the 3,500 ft. elevation on the north side of Lime Creek, a tributary of Rock Creek and the Kotsina River.

Township: 002 S. *Range:* 008 E. *Section:* 15
Quadrangle: McCarthy C-8 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:
1900 - Two claims staked by Dick Gilleneau, Joe Bell, and A.L. Barrett (KX 87-033).
1902 - Development work done (Mendenhall and Schrader, 1903).
1907 - Development work done (Moffit and Maddren, 1908).
1914 - Development work done (Moffit, 1915).
1971 - Claims staked by Joseph Taylor (KX 87-156).

Operating data:
Two tunnels and two open cuts (Moffit and Maddren, 1908).
- Lower tunnel.
- Upper tunnel, 20 ft. long.

Geologic setting:
Small faults cut the Nikolai Greenstone near the contact with the Chitistone Limestone. The faults contain bornite and chalcopyrite accompanied by quartz and epidote (Moffit, 1915). The bornite occurs as lenses and irregular 1 in. lumps in the greenstone as well as fracture fillings and small lenticular veins (Moffit and Maddren, 1908).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located during 1997.
Estimated location:
Latitude N 61° 41' 28"; Longitude W 143° 55' 52"; Elevation 3,500 ft.

References:

Bibliography:

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LONDON AND CAPE

MAS no: 0020870090 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Trail Creek
Company name(s):
Mineral survey(s):

Commodity: Copper, molybdenum, silver
Deposit type: Porphyry Cu-Mo

Location: Located at the 4,500 ft. elevation along the ridge on the west side of Trail Creek, a southern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 35
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:

1909 - Reportedly 14 claims patented by the London and Cape Co. (Moffit and Mertie, 1923).
1912 - Work had ceased on the property (Moffit and Mertie, 1923).
1919 - Supposedly staked by Theovak Wagenen - 14 claims (KX 87-48). May be confused with the War Eagle claims.

Operating data:

A 245 ft. long adit driven (Moffit and Mertie, 1923).

Geologic setting:

Most of MacDougall Creek area is made up of granodiorite but the mineralized area consists of Jurassic conglomerate, sandstone, shale, Chitistone Limestone, and the overlying Triassic shales (Kuskulana Formation) (Moffit and Mertie, 1923).

The area of the adit is composed of granodiorite which has been fractured and weathered into angular fragments. The fracturing created an environment favorable for circulation of mineralized solutions, that deposited iron and copper sulfides. Minerals include pyrite and copper staining. The workings were driven to intersect an ore body beneath the ridge, but was not driven far enough. No copper mineralization was encountered (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located but not sampled during 1997.
  Adit caved at portal, located from the air, but could not get to due to weather conditions.
  Estimated location:
  Latitude N 61° 34' 07"; Longitude W 143° 43' 04"; Elevation 4,500 ft.
- These claims and those of the War Eagle have been confused as to which were patented and part of Mineral Survey 874. Those patented claims and Mineral Survey 874 are part of the War Eagle group.

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MINERAL CREEK

MAS no: 0020870048 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Granite Mountain
Valdez Claim
Valdez Group Nos. 1-6
Valdez No. 1
Company name(s):
Mineral survey(s):

Commodity: Copper, gold, silver
Deposit type: Basaltic Cu

Location: Approximately between the 3,600 ft. and 7,100 ft. elevation of Mineral Creek on the west side of Granite Peak. Mineral Creek is a southeastern tributary of the Kluvesna River.

Township: 001 S. ***Range:*** 008 E. ***Section:*** 26
Quadrangle: McCarthy D-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1923 - Six claims were staked by A.L. Barrett, Ed Young, and Jake Nafsted (B745, KX 87-036).
1971 - Fifty-five claims were staked in the area by Joseph Taylor (KX 87-156).

Operating data:
Half a dozen tunnels started with the most recent on the Valdez Group claims (Moffit and Mertie, 1923).

- Principle Tunnel
  Driven S. 25° W. for 50 ft. and then two branches. One branch heads south for an unknown length and the other branch is driven S. 70° W. for 50 ft. The main adit follows a bedding or flow plane containing pyrite and chalcopyrite in crushed quartz and country rock (Moffit and Mertie, 1923).
- Valdez No. 1 Tunnel
  Located 350 ft. higher than the Principal Tunnel. Unknown length. Contains pyrite in calcite and quartz (Moffit and Mertie, 1923).
- Short Tunnel
  Located 200 ft. higher on the northeast side of the creek. Contains a mineralized quartz vein (Moffit and Mertie, 1923).
- Two short tunnels
  Located opposite the Valdez Group claims and are 75 ft. apart vertically. Unknown mineralization (Moffit and Mertie, 1923).
- Short Tunnel
  Located 4,600 ft. above the Kluvesna River. Contains a 18 in. vein in a fault within the Nikolai Greenstone. Assay reported $60.00 per ton Au (Moffit and Mertie, 1923).

Geologic setting:
Strelna Formation cherts and tuffs interbedded with lava flows striking almost north and dipping

45° E. The Strelna Formation is intruded by diorite, and more basic, dark-colored fine-grained dioritic rocks, containing disseminated pyrite. The bedrock is cut by numerous faults containing quartz veins and associated pyrite, chalcopyrite, and minor chalcocite (Moffit and Mertie, 1923).

Assays of a 4 ft. thick vein in the Principal Tunnel contained $9.75 in Au and 3 oz. Ag per ton. One 18 in. thick quartz vein in the highest adit assayed $60 per ton Au in 1923 (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Looked for but not located in 1997.

References:

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MULLEN MINE

MAS no: 0020860126 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Angle Lode
Copper Creek
Hoffman Prospect
Mullen Group
Mullen Lode
Sport Lode
Copper Mountain Millsite

Company name(s):
Alaska Copper Mining Co. Inc.
Alaska Hurlock Syndicate
Alaska Pioneer Copper Co.
Copper Creek Copper Mining Co.
Copper River Exploration
Coronada Copper and Zinc Co.
Galena Bay Mining Co.
Golden Bay Mining Co.

Commodity: Copper, gold, silver
Deposit type: Basaltic Cu

Mineral survey(s):
M.S. 904

Patent number(s):
806021

Location: The Mullen No. 1 Adit is located at the 3,755 ft. elevation on the west side of Copper Creek, a southern tributary of the Kotsina River.

Township: 002 S. ***Range:*** 007 E. ***Section:*** 24
Quadrangle: Valdez C-1 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer/Patented

Development and Geology:

History and production:

1900 - A 15 ft. long open cut with a shallow shaft at its end (Schrader and Spencer, 1901).
- A ton of material mined and two select samples contained 30% Cu with one sample having over 2 oz. Au and one having 1/10 oz. Ag (Schrader and Spencer, 1901).
- Hoffman Prospect staked (KX 86-141).

1907 - Fifteen claims staked by Scott Simenstad and E.W. Hundley (KX 86-064).

1911 - Mineral Survey 904 surveyed, October 11-12, for the Galena Bay Mining Co. Claims include the Angle, Mullen, and Sport Lodes.
- Mineral Survey 906 surveyed, October 22, for the Galena Bay Mining Co. Claim includes the Minneapolis Lode.
- Mineral Survey 908 surveyed, October 16-17, for the Galena Bay Mining Co. Claims include the Franklin Lode and the Franklin Nos. 2-3 Lodes.

1916 - Six claims staked by Robert Jenkins (KX 86-148).

1917 - Three open cuts, northern cut 20 ft. long, 10 ft. deep, middle cut, southern cut (Moffit and Maddren, 1908).

1921 - Patented May 12, 56.057 acres.
1926 - Development work done (Smith, 1927).
- Eight claims staked by A.K. Crawford and Adolph Ammann (KX 86-140).
1927 - Development work completed by several men hired by George H. Hurlock (Smith, 1930a).
1928 - Some work done (Smith, 1930b).
1929 - Inactive (Smith, 1930c).
1930 - Inactive (Smith, 1931).
1936 - Mining done (Smith, 1938).
1944 - Workings include an open cut, two adits with drifts, crosscuts, and inclined shafts.
- 800 ft. of underground workings, unknown length of the inclined shafts, and possible flooding. No. 2 adit is caved (Van Alstine and Black, 1946).
1969 - Thirty-nine claims staked by John Hewitt and Scott Simenstad (KX 86-165).
1971 - Sixty-two claims staked by Joseph F. Taylor and Warren T. Taylor (KX 86-172).

Production:

One ton of material mined (Schrader and Spencer, 1901).

Operating data:

By 1911 the Angle, Mullen, and Sport Lodes Mineral Survey 904 reports 7 open cuts, 3 tunnels, and 1 shaft.

Workings include 4 open cuts, a shallow shaft, 2 adits with 800 ft. of workings which include drifts, crosscuts, and an inclined shaft.

As of 1944 the Lower Camp included; sawmill, engine house, stable, blacksmith shop, garage, bunkhouse, bath house, warehouse, office, mess hall, assay office, and 3 store houses.

Upper Camp includes 3 bunk houses, mess hall, and bath house.

Mullen No. 1 adit has a compressor house and a tool shop (Van Alstine and Black, 1946).

Van Alstine with the USGS published a map of the underground workings of the No. 1 Adit and the No. 2 Adit in 1946 (Van Alstine and Black, 1946).

Geologic setting:

Three poorly defined north-south mineralized zones, 1 to 3 ft. thick, made up of altered limestone. Ore minerals include chalcopyrite and bornite with malachite and iron-oxide staining (Schrader and Spencer, 1901).

In the underground workings the Chitistone Limestone is exposed through most of them with the Nikolai Greenstone exposed near the end of several crosscuts. Small bodies of diorite are located along the contacts as well as intruding into them. The diorite is a lighter colored highly altered medium-grained granitoid rock. Faults are abundant and conspicuous near the diorite bodies. A ½ to 4 in. wide calcite and copper vein follows a N. 10° W. slickenslide fault zone in the No. 1 adit (Van Alstine and Black, 1946).

Recent investigations:

USGS/USBM/BLM work:

USGS

- Two select samples contained 30% Cu with one sample having over 2 oz. Au and the other having 1/10 oz. Ag (Schrader and Spencer, 1901).

BLM

- Located and sampled several adits and one open cut during 1997.

Mullen No. 1 Adit

Adit open, driven S. 72° E. along a shear zone containing quartz and chalcopyrite. The first crosscut contains dynamite, also remnant of incline shaft visible at the right side of the portal. Two collapsed buildings were located outside the portal.

Latitude N 61° 40' 35"; Longitude W 144° 03' 53"; Elevation 3,755 ft.

Sample AAWSE 10040 taken from the quartz shear zone at the portal contained 12.2% Cu, 23.6 ppm Ag, and 286.1 ppm Cd.

Mullen No. 2 Adit

Adit caved at the portal. This adit appeared to be the haulage tunnel as there were rails connecting this adit with Adit No. 1. Driven 100 to 150 ft. below the open cut, most likely driven to undercut this mineralized zone.

Latitude N 61° 40' 33"; Longitude W 144° 03' 52"; Elevation 3,580 ft.

No samples collected, no mineralization noted.

Mullen No. 3 Adit

Adit open, driven N. 68° E. for 10 ft. just below and north of the No. 1 Adit. Most likely driven to undercut the shear zone in Adit No. 1. Thirty feet above this adit was a wooden platform, possibly to assist in starting another adit. Malachite stained rocks were noted above this location.

Latitude N 61° 40' 35"; Longitude W 144° 03' 53"; Elevation 3,670 ft.

No samples collected, no mineralization noted.

Mullen No. 4 Adit

Adit open, driven N. 68° E. for 27 ft. where it intersects a 12 in. wide shear zone containing ½ in. quartz veins. No visible mineralization was noted in the shear. This adit had the remains of a wooden door frame and the door lying close by. Was this adit used as a root cellar?

Latitude N 61° 40' 36"; Longitude W 144° 03' 53"; Elevation 3,690 ft.

No samples collected, no mineralization noted.

Mullen Open Cut

Open cut driven westward into the face of the limestone outcrop 100 to 150 ft. above Mullen No. 2 Adit. The open cut is 15 ft. wide x 20 ft. tall x 20 ft deep. Mineralization consists of malachite, azurite, and massive chalcopyrite in a iron-stained shear zone.

Latitude N 61° 40' 30"; Longitude W 144° 03' 57"; Elevation 3,850 ft.

Sample AAWSE 10039 collected along the face contained 34.46% Cu, 40.5 ppm Ag, and 38 ppb Au. Sample AAWSE 10039-A collected of "High Grade" contained 36.64% Cu, 109.7 ppm Ag, and 45 ppb Au.

Resources:

USGS

- 1946 (Van Alstine and Black, 1946)

Vein no. 1 - 1,263 tons indicated ore with 1.55% Cu.

Vein no. 2 - 59 tons indicated ore with 5.82% Cu, trace Au, and 0.28 oz. per ton Ag.

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NABESNA MINE

MAS no: 0020780010 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Carl Whitham Mine
Alidade #1
Bear Vein
Moon Shine Lode
No. 49 Vein
Nugget Vein
Sunshine Lode
White Mountain Lode Nos. 10-11, and 13-15
White Mountain Nos. 1-6,
White Mountain Quartz Nos. 7-9
Nabesna Mill
"El-Se-Ba" (Native for "The White Mountain")

Commodity: Gold, silver, copper, lead, zinc
Deposit Type: Carbonate-hosted Fe skarn

Company name(s):
Nabesna Mining Corp.
Ptarmigan Mining Co.
Royal Development Co.

Owner:
Kirk Stanley
P.O. Box 200956
Anchorage, AK 99520

Mineral survey(s):
M.S. 1591

Patent number(s):
1079922

Location: Located between the 4,200 and 4,850 ft. elevations on the north side of Camp Creek, on the east side of White Mountain, northwest of the Nabesna Mill site. Located northeast of the Royal Development Co. site.

Township: 007 N. ***Range:*** 013 E. ***Section:*** 21
Quadrangle: Nabesna B-5 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Past producer/Patented

Development and Geology:

History and production:

1903 - Twenty-eight claims were staked by Yvonne Alford, A.J. Field, Paul Paulson, Carl Whitham, and Wayne Dolt (KX 78-026).
Pre 1924 - Work in the area was done on the Royal Development Co. occurrence.
1924 - Royal Development Co. claims relocated by Carl F. Whitham (Wayland, 1943).
1925 - The Bear Vein was discovered 1,000 ft. northeast of the Golden Eagle (Wayland, 1943).
1926-28 - Development work included 50 ft. cut, 30 ft. shaft, exposed the 100 ft. portal vein (Wayland, 1943).
1929 - Nabesna Mining Corp. formed; Mr. Carl F. Whitham, President and General Manager (Wayland, 1943).

- Tram built to the mill site at the base of the cliff (Wayland, 1943).

1930 - 2,000 ft. tram line built, 150 ft. tunnel driven on the Bear Vein (AK Miner 1/3/39).

1931 - Small mill in operation and permanent camp under construction (Wayland, 1943).
- Work began on the 250 ft. level (Wayland, 1943).

1932 - Mineral Survey 1591 surveyed, July 20 - August 8. Claims include White Mountain Nos. 1-6, White Mountain Quartz Nos. 7-9, White Mountain Lode Nos. 10-11, 13-15, Moon Shine Lode, and Sunshine Lode.

1933 - Work began on the 650 ft. level (Smith, 1942), the Tower Knob level, was driven 900 ft. (Moffit, 1936).

1934 - 2,900 ft. of underground development work completed, larger crusher installed, new tram constructed to the 650 ft. level, 35 men employed (Smith, 1936).
- Mill capacity increased from 30 to 60 tons per day (Roehm, 1936).
- 9,955 tons of ore was mined, trammed, and milled (Roehm, 1936).
- Average ore value during the third quarter was $33.69 per ton (Moffit, 1936).

1935 - Mill treating 60 tons per day of ore and operating season year-round basis (Wayland, 1943).
- Recovery increased 50 to 90%, costs reduced to make $15.00 ore profitable (Wayland, 1943).
- Six new flotation cells were put into operation and a cyanide plant built (Smith, 1937).
- Present mill has a capacity of 120 tons per day (Moffit, 1937).
- 16,443 tons of ore mined, trammed, and milled (Roehm, 1936).
- Patent issued on December 9.

1936 - All stoping done between the 250 ft. and 450 ft. levels (Wayland, 1943).
- Underground workings include 3,203 ft. of drifts and stopes raises and the extraction of 11,653 tons of ore (Smith, 1938).
- Leaching system in the cyanide plant was replaced into a continuous-process agitation unit (Smith, 1938).

1937 - No. 49 vein discovered (Wayland, 1943).
- Reported production included mining 8,800 tons of ore and treating an additional 7,300 tons of tailings. 2,000 ft. of underground openings were driven (Smith, 1939a).

1938 - 2,589 ft. of underground workings driven, 12,225 tons of ore and 5,801 tons of tailings were treated, with an average value of $42.65 for the ore and $14.69 for the tails.
- Mill recovery was 91.57%, with 595 tons of concentrates with 517 tons shipped to the smelter (Smith, 1939b).

1939 - Most of the known veins worked out (Wayland, 1943).
- 5,000 tons of ore mined and milled, 1,630 ft. of underground workings driven (Smith, 1941).

1940 - Mining and milling continued at a reduced rate. Operations were discontinued by September 11 (Smith, 1942).
- Gross production was $1,869,396 which includes some silver and copper recovered at the Tacoma smelter (Wayland, 1943).
- Thirty-four placer claims were staked by the Nabesna Mining Co. (KX 78-027).

1946 - First shipment of ore since closed for war, 4 tons valued at $1,000 per ton, September 15. Fourteen to 16 men working since June 1 (AK Miner 10/11/46).
- Closed October 15, treated 540 tons of Golden Eagle ore.

1960 - One claim staked by Lenhart Grothe (KX 78-059).

19?? - Property purchased by Kirk Stanley.

Production:

1931 - Concentrate production valued at $460,759.00 (AK. Miner 1/3/39).

1934 - 9,955 tons of ore milled with average value of $32.86 per ton (Roehm, 1936).
- A total of 329.982 tons of concentrates were produced and shipped (Roehm, 1936).

1935 - 16,443 tons of ore milled with average value of $19.52 per ton (Roehm, 1936).
- A total of 415 tons of concentrates were produced and shipped (Roehm, 1936).
- Gross production value of bullion and concentrates was $257,492.95 (Roehm, 1936).

1936 - 4th quarter report (Roehm, 1936).
- 2,393 tons of ore milled with average value of $22.10.
- 1,670.23 tons of tailings treated with average value of $1.35.
- A total of 49.71 tons of mill concentrates were produced and shipped.
- A total of 673.06 tons of cyanide concentrates were produced and shipped.
- Gross value of mill concentrates and bullion was $36,975.57.
- Gross production value of cyanide concentrates and Au precipitate was $20,825.14.
- Total gross production value was $57,800.71.

1937 - 3rd and 4th quarter reports (Roehm, 1936).
- 3,961 tons of ore milled with average value of $19.46.
- 5,232 tons of tailings treated with average value of $16.02.
- A total of 250.84 tons of mill concentrates were produced and shipped.
- A total of 3,922.96 tons of cyanide concentrates were produced and shipped.
- Gross production value of mill concentrates was $88,857.98.
- Gross production value of tailings was $83,816.64.
- Gross production value of cyanide concentrates and bullion was $69,671.99.
- Total gross production value was $242,346.61.

1938 - 1st, 3rd, and 4th quarter reports (Roehm, 1936).
- 9,161 tons of ore milled with average value of $43.42.
- 5,801.1 tons of tailings treated with average value of $14.69.
- A total of 283.29 tons of mill concentrate were produced and shipped.
- A total of 1,460.15 tons of cyanide concentrates were produced and shipped.
- Gross production value of mill concentrates was $322,531.68.
- Gross production value of tailings was $48,227.34.
- Gross production value of cyanide concentrates and bullion was $20,843.84.
- Total gross production value was $391,602.86.
- Total gross value of production to October 1, 1938 is $1,568,723.00 (AK Miner 1/3/39)

1939 - 1st and 2nd quarter reports (Roehm, 1936).
- 5,029 tons of ore milled with average value of $18.28.
- 729.6 tons of tailings treated with average value of $12.59.
- A total of 135.74 tons of mill concentrates were produced and shipped.
- A total of 21.78 tons tailings concentrates produced and shipped.
- Gross production value of mill concentrates was $81,888.93.
- Gross production value of tailings concentrates was $5,515.58.
- Total gross production value was $87,404.51.

1940 - 2nd and 3rd quarter reports (Roehm, 1936).
- 1,994.7 tons of ore milled with average value of $15.48.
- 2,102.4 tons of tailings treated with average value of $6.33.
- A total of 53.97 tons of mill concentrates were produced and shipped.
- A total of 33.41 tons of tailings concentrates produced and shipped.
- Gross production value of mill concentrates was $26,837.62.

- Gross production value of tailings concentrates was $13,310.73.
- Total gross production value was $40,148.35.

1946 - Mine reopened for 3 months (AK Miner ?/1946).
- Treated 540 tons Golden Eagle ore valued at $15.42 per ton.
- Produced 9.19 tons concentrates.
- 172.478 oz. Au and 126.475 oz. Ag valued at $6,151.08.
- Reported production included mining 8,800 tons of ore and treating an additional 7,300 tons of tailings (Smith, 1939a).
- Gross production was $1,869,396.00 which includes some silver and copper recovered at the Tacoma smelter (Wayland, 1943).

Operating data:

1932 - Mineral Survey 1591 surveyed in 2 common improvement tunnels, 1 open cut, and 1 glory hole. Total value estimated at $34,800.00.

1934 - Improvements include: a mill addition, a mine office building, 3 staff quarters buildings, a concentrate storage shed, a garage and heating plant building, a warm-storage building for perishable supplies, a Marcy grinding unit, a Dorr classifier, an air compressor at the 650 ft. level portal, a pump for winter pumping, and a heating-plant boiler with a radiation capacity of 5,000 ft. (Moffit, 1936), 120 hp. diesel engine, two trams, one to the 250 ft. level and one to the 650 ft. level (Moffit, 1937).

Workings: (Roehm, 1936)

650 ft. Level - Lower Tunnel
1,500 ft. of drifts, 349 ft. 58° incline connected to the 250 ft. Level, 251 ft. crosscut, and a 20 ton ore bunker.

550 ft. Level
Over 50 ft. of drifts.
No. 49 Stope raised to the 450 ft. Level.
No. 53 Stope raised to the 450 ft. Level.

450 ft. Level
Over 510 ft. of drifts and over 160 ft. stope raise.

350 ft. Level
700 ft. of drifts and a 124 ft. stope raise.

250 ft. Level
Over 243 ft. of drifts and 1,596 ft. of stope raises
Nugget Crosscut - 639 ft. open to surface

100 ft. Level - Old Level
At the 4,200 ft. elevation.

650 ft. Level North
500 ft. of drifts.

Nugget Vein Tunnel
Over 143 ft. of drifts.

Mill
An 80 ton ore bunker.

Geologic setting:

Up to 1,000 ft. of bluish-gray Late Triassic Nabesna Limestone exposed on east side of White Mountain. The limestone is overlain by over 500 ft. of thin-bedded impure limestone overlain by

Cenezoic of lava flows (Moffit, 1933). Limestone is faulted and intruded by large irregular masses of locally altered diorite.

The ore body was formed along a contact surface between the diorite and massive limestone which trends northeastward and a near vertical westward dip (Moffit, 1933). The ore deposits occur as three types: 1) bodies of magnetite with pyrite, calcite, and some gold; 2) veins and bodies of pyrrhotite with minor pyrite and gold; and 3) the greatest producing type, gold-bearing pyrite veins in tacite or along intrusive contacts (Koschmann and Bergendahl, 1968).

Metallic minerals recovered from the mill tables include gold, lead sulphate, pyrite, small amounts of chalcopyrite, and magnetite (Moffit, 1933).

Recent investigations:

USGS/USBM/BLM work:

BLM

- A tour of the mill and assay buildings, the Nabesna townsite, and an overview of the mineralization of the mine was given by Kirk and Jack Stanley. John Devenport, an Ahtna, Inc. representative, was also present for the tour.
- No samples were collected as per Mr. Stanley's request.

Resources:

No resource estimate was prepared for this property as it is privately owned.

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ALASKA KARDEX 78-027
ALASKA KARDEX 78-059

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O'HARA

MAS no: 0020870079 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Bloom Creek 1-10
Francis No. 1
Golden Boy No. 1
Hufico Group
Hunt 1-13
Nelson Mtn.
O'Hara-Farmun Prospect
Patricia No. 1
Queenie No. 1-2
Company name(s):
Mineral survey(s):

Commodity: Lead, zinc, iron
Deposit type: Polymetallic vein

Location: At approximately the 3,800 ft. elevation on the north side of Nelson Mtn. on a southern tributary of the Chitina River.

Township: 006 S. ***Range:*** 009 E. ***Section:*** 20
Quadrangle: McCarthy B-8 ***Meridian:*** Copper River
Mining district: Nizina ***Mineral status:*** Development prospect

Development and Geology:

History and production:

1924 - Six tons of supplies sledded up to the prospect in the winter (Shepard, 1925).
- Two cabins built (Shepard, 1925).

1925 - Claims staked by Farmun and O'Hara (KX 87-016).

1985 - Ten claims staked by Howard Hunt and William Fike (KX 87-146).

Operating data:

1924 - A 20 ft. long open cut (Shepard, 1925).

1940 - Three adits have been driven (Berg and Cobb, 1967).

Geologic setting:

Permian (MacKevett and Holloway, 1977) marble containing sparse veins up to 8 in. thick galena, sphalerite, pyrite, marcasite, and pyrrhotite. The marble also contains thin layers of mica schist and minor disseminated tourmaline, pyrite, pyrrhotite, and sphalerite (Berg and Cobb, 1967).

Ore body is 12 ft. wide, striking N. 80° E. and dipping 35° W., containing 10 to 15% lead, some zinc, and a little iron. The lead occurs in bands of solid mineral and is disseminated throughout the limestone gangue. The ore body shows a distinct hanging wall and a gradual lessening of impregnation in the foot wall. A small greenstone (andesite) dike intersects the ore body near the surface, dipping flatly to the east (Shepard, 1925).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Looked for but not accessible due to weather in 1997.

References:

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PEACOCK CLAIM

MAS no: 0020860193 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Company name(s):
Adolph Ammann
Mineral survey(s):

Commodity: Copper, silver
Deposit type: Basaltic Cu

Location: Located at the 4,140 ft. elevation, southeast of the Mullen Prospect, on the east side of Copper Creek, a southern tributary of the Kotsina River.

Township: 002 S. *Range:* 007 E. *Section:* 25
Quadrangle: Valdez C-1 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:
Claim staked by Adolph Ammann (Date unknown).

Operating data:
None reported.

Geologic setting:
Nikolai Greenstone overlain by Chitistone Limestone (strikes N. 40° W. and dips 25° SW). Mineralized veinlets up to 1 in. thick consisting of pyrite, bornite, and minor chalcopyrite and surface malachite and azurite staining (Van Alstine and Black, 1967).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located and sampled during 1997.

Adit was driven N. 2° E. and caved-in at 34 ft. were it pancakes out and extends for another 30 to 50 ft. Rocks from the adit were used to build walls outside the adit. Latitude N 61° 40' 15"; Longitude W 144° 03' 40"; Elevation 4,140 ft.

No visible mineralization was noted in the adit or on the waste dump. Sample AAWSE 10042 was collect of chalcopyrite that had been integrated, or placed, into the rock wall. The sample contained 3.1% Cu, 4.8 ppm Ag, and 77 ppb Au.

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PLATINUM CREEK

MAS no: 0020780129 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Platinum Group Metals
Deposit type: Placer

Location: Approximately 2 miles from the mouth of Platinum Creek, north of Gillam Lake.

Township: 008 N. *Range:* 014 E. *Section:* 27
Quadrangle: Nabesna B-4 *Meridian:* Copper River
Mining district: Chisana *Mineral status:* Raw prospect

Development and Location:

History and production:
None reported.

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for in 1997.

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PORCUPINE CREEK HEAD

MAS no: 0020870041 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper, gold
Deposit type: Basaltic Cu

Location: At approximately the 3,940 ft. elevation at the headwaters along the west side of Porcupine Creek, a northern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 09
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1916 - Four claims staked by A.L. Barrett, Ed Young, and Jake Nafsted (KX 87-037).
1923 - Two tunnels driven, one just recently started (Moffit and Mertie, 1923).

Operating data:
Two short tunnels (Moffit and Mertie, 1923).

Geologic setting:
Nikolai Greenstone sheared with minute veinlets of malachite and minor chalcopyrite (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located during 1997.

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PORCUPINE CREEK MOUTH

MAS no: 0020870050 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper, gold
Deposit type: Basaltic Cu

Location: At approximately the 3,780 ft. elevation near the mouth along the west side of Porcupine Creek, a northern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 09
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1923 - Two tunnels driven (Moffit and Mertie, 1923).

Operating data:
Two tunnels (Moffit and Mertie, 1923)
- One caved.
- One driven 125 ft. with two short branches.

Geologic setting:
Shattered Nikolai Greenstone stained with iron-oxide and cut by dikes of diorite. Outcrop shows stringers of cavernous quartz containing pyrite and stained with iron-oxide and malachite, possibly derived from the chalcopyrite associated with the pyrite (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

References:

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RAMBLER MINE

MAS no: 0020780036 ***Figure no.*** 2

Ownership and Location:

Alternate Name(s):
Golden Eagle Group
Cliff Vein
Company Name(s):
Nabesna Mining Corp.
Kirk Stanley
Mineral Survey(s):

Commodity: Gold, copper, silver
Deposit Type: Carbonate-hosted Fe Skarn

Patent Number(s):

Location: Located at the 3,400 and 3,640 ft. elevations on the west-northwest side of White Mountain, approximately ½ mile north of the Nabesna Mine.

Township: 007 N. ***Range:*** 013 E. ***Section:*** 16
Quadrangle: Nabesna B-5 ***Meridian:*** Copper River
Mining District: Chisana ***Mineral Status:*** Past producer

Development and Geology:

History and Production:
19?? - Cliff vein located by Carl Whitham, development work done.
1953 - 111 claims staked by Kirk Stanley, Howard Grey, Kenneth Hallback, and Howard McWilliams (KX 78-003).

Operating Data:
Average value of ore by Mr. Whitham was $32 Au per ton. The highest assay was $85 per ton (Wayland, 1943).

Geologic Setting:
Outcrop 52 ft. long, 19 ft. wide, 34 ft. high and trends northeastward. Coarsely crystalline pyrrhotite up to 2 in. in diameter, along with pyrite, chalcopyrite, and marcasite. Wall rock is crystalline limestone with associated andesitic dikes with a few iron-stained vugular quartz crystals.
Possible sphalerite crystals noted in the dike rock found in the waste dump.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located two adits and collected one sample in 1997.
Workings included 4 buildings (assay, office, bunkhouse, storage shed), an ore bunker, a metal-lined ore shoot with cabled ore car between the levels, generator, and numerous drill steel.

No. 1 Adit
Adit iced-in 20 ft. from portal.
Latitude N 62° 23' 03.577"; Longitude W 143° 00' 29.438"; Elevation 3,640 ft.

No samples collected from the adit.

A chip sample AAWSE 10027 taken from vein, above the adit at the 3,750 ft. elevation, was composed of pyrrhotite and chalcopyrite. Sample collected to get an idea of the mineral values at this location. The sample contained 3,301 ppm Cu, 103.3 ppm Ag, and 8.68 ppb Au.

No. 2 Adit

Adit open, unknown length. Appears to be iced-in.

Latitude N 62° 23' 07.028"; Longitude W 143° 00' 19.522"; Elevation 3,400 ft.

No samples collected, no visible mineralization noted.

Resources:

No resource estimate was completed for this property due to a validity examination being conducted by the NPS.

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ROCK CREEK MOLY

MAS no: 0020780004 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Todd Claims
Discovery Group
Rock Creek Moly 1-7
Bessie M Disc
Bessie M 1-6 E Disc
Bessie 1 West

Commodity: Molybdenum
Deposit type: Polymetallic vein

Company name(s):
Mineral survey(s):
Patent number(s):

Location: At the 5,170 ft. elevation in the ravine on the west side of Rock Creek at its headwaters.

Township: 010 N. *Range:* 011 E. *Section:* 33
Quadrangle: Nabesna C-5 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:

1936 - Seven claims staked by L. Dewitt, David Vietti, Vern Horn, George Todd, and Carol Aldredge (KX 78-011).
- Six claims staked by George Todd, William Frame, Lawrence DeWitt, and Ben Horn (Smith, 1939a).

1937 - Development work included a camp, trail, and 2 opencuts (Smith, 1939a).
- Contract let in September to Kennecott Copper Corp. To drive a 150 ft. Tunnel (Smith, 1939a). Tunnel started in winter of 1937 (Moffit, 1941).

1938 - Tunnel driven and testing done. Results were disappointing and the work was discontinued (Smith, 1939b). Tunnel completed in summer (Moffit, 1941).

Operating data:

Two open cuts and a 160 ft. adit driven N. 13° W.

Geologic setting:

Alkali pegmatite dike, up to 2 ft. wide, containing molybdenite up to 1.5 inches in diameter. Dike strikes N. 20° W. And dips 60° SW and is traceable for 70 ft. Bedrock consists of gniess rocks of the Jurassic - Triassic diorite complex. Molybdenite occurs as plates, lumps, and tiny veinlets and is irregularly distributed in the pegmatite (Moffit, 1954).

Recent investigations:

USGS/USBM/BLM work:

BLM
- Located and sampled in 1997.

Adit open, partially sloughed, driven N. 48° E. for approximately 150 ft. Latitude N 62 35' 54.617"; Longitude W 143° 21' 20.739"; Elevation 5,170 ft.

Sample AAWSE 10016 of iron-stained basalt taken from the floor of the adit. The sample contained visible molybdenum and pyrite and chloritic (green) weathering. The sample contained 3 ppm Mo and 27 ppm Cu.

Sample AAWSE 10017 was taken of a biotite schist with chlorite and pyrite from the waste dump, visible chloritic weathering. The sample contained 4 ppm Mo, 13 ppb Au, and 81 ppm Cu.

Sample AAWSE 10018 was taken of a rhyolitic gneiss containing visible biotite, chalcopyrite, and pyrite from the waste dump. The sample contained 13 ppm Cu and 3 ppm Mo.

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ROYAL DEVELOPMENT CO.

MAS no: 0020780009 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Glacier
Jacksina Creek
Monte Cristo
Ramshorn Group
Stonehead Group

Company name(s):
Nabesna Mining Corp.
Ptarmigan Co.
Royal Development Co.
Webb Co.

Owner:
Kirk Stanley
P.O. Box 200956
Anchorage, AK 99520

Commodity: Gold, copper
Deposit type: Carbonate-hosted Fe skarn

Mineral survey(s):
M.S. 1591

Patent number(s):
1079922

Location: Located at the 3,910 ft. elevation on the north side of Camp Creek on the south side of White Mountain, southwest of the Nabesna Mine.

Township: 007 N. ***Range:*** 013 E. ***Section:*** 20
Quadrangle: Nabesna B-5 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Past producer/Patented

Development and Geology:

History and production:

1989 - Prospectors panned colors of gold from the White Mountain cliffs (Wayland, 1943).
1903-05 - A.J. Field and Paul Paulson located 28 claims (Wayland, 1943).
1906 - Royal Development Co. formed (Wayland, 1943).
1906 - Managers James Casey and J.L. Hanson brought in a 3-stamp mill (Wayland, 1943).
1907 - Mill operated, 60 tons ore crushed, $30.00 per ton Au (Capps, 1915).
- Recovered $12.00 per ton free Au (Capps, 1915).
1907-14 - Royal Development Co. continued assessment work (Wayland, 1943).
- Drove two tunnels totaling 130 ft. (Wayland, 1943).
1915 - Claims lapsed.
1924 - Claims relocated by Carl F. Whitham (Wayland, 1943).
1925 - Development and mining was concentrated at the Bear Vein (Nabesna Mine).
1935 - Patented as part of the Nabesna Mine on December 9.
1940 - Prospecting by the Nabesna Mining Corp. was reported to be promising (Smith, 1942).
1941 - A 450 ft. tunnel was driven but stopped 150 ft. short of the ore zone (Moffit, 1944).

Operating data:

1906 - 3-stamp mill (Wayland, 1943).
1941 - 450 ft. tunnel (Moffit, 1944).

Geologic setting:

A gossan derived from the oxidation of a pyritized sheared diorite and the oxidation of the adjoining pyritized contact-metamorphosed Nabesna Limestone. Deposit trends N. 45° E. ranging from 4 to 15 ft. wide. Ore consists of iron-stained cellular quartz carrying free gold (Moffit, 1909).

Recent investigations:

USGS/USBM/BLM work:

BLM

- A tour of the mill and assay buildings, the Nabesna townsite, and an overview of the mineralization of the mine was given by Kirk and Jack Stanley. John Devenport, an Ahtna, Inc. representative, was also present for the tour.
- No samples were collected as per Mr. Stanley's request.

Resources:

No resource estimate was prepared for this property as it is privately owned.

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SILVER STAR MINE

MAS no: 0020870049 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Granite Mountain
Granite Mountain 1-69
Granite Peak
Louise Lode
Pandora Nos. 1-3
Rock Creek 2-¼ mile
Silver Star Group
Silver Star Nos. 1-7, and 9-13
Vesna
Pandora Millsite
Silver Star Millsite

Company name(s):
Barry Brothers
Granite Mountain Mining Co.
Silver Star Mining Co.

Mineral survey(s):

Commodity: Silver, copper, bismuth, antimony, lead, zinc
Deposit type: Basaltic Cu

Location: Two adits located at the 4,875 ft. and the 4,915 ft. elevations, west of Granite Peak, on the west side of Finnesand Creek, a northern tributary of the Kotsina River.

Township: 001 S. ***Range:*** 008 E. ***Section:*** 35
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Past producer

Development and Geology:

History and production:

1916 - Neil and Thomas Fennesand claim owners (Moffit and Mertie, 1923).
1963 - Claims staked by Neil Fennesand, Joseph Barry, R. Benson, and Douglas D. Kirk (KX 87-038).
1971 - Sixty-nine claims staked by Neil Fennesand, Warren Taylor, and Joseph Taylor (KX 87-132).
1982 - No production completed (Eakins, etal, 1983).
1983 - Silver Star Mining Co. produced 24 tons of high-grade silver-gold ore (Bundtzen, etal, 1984).
1985 - Production completed (Bundtzen, etal, 1985).
1986 - Failed to obtain approval from the NPS to operate (Bundtzen, etal, 1987).
1988 - Mine in a standby status pending resolution of lawsuit with NPS (Green, etal, 1989).

Production:

Silver Star Mining produced 24 tons of high-grade silver-gold ore (Bundtzen, etal, 1984).
Since 1979, 50 to 100 tons of hand-picked silver (tetrahedrite) ore mined (Bundtzen, etal, 1982).
Reportedly produced 30,000 oz. silver during past mining seasons (Bundtzen, etal, 1985).

Operating data:

A lower 260 ft. long tunnel with two crosscuts. The tunnel was driven N. 20° W. for 170 ft. then branching out into one crosscut going N. 80° W. for 30 ft. and the other going 60 ft. in the general direction of the main entry. Tetrahedrite is the principle mineral (Moffit and Mertie, 1923).

The upper tunnel driven 20 ft. starting in an open cut. Tunnel driven along a 30 in. wide fault zone containing silver-bearing tetrahedrite, malachite, azurite, and galena (Moffit and Mertie, 1923).

An open cut between the two tunnels following a vertical fault trending N. 10 to 20° W. (Moffit and Mertie, 1923).

Numerous open cuts along the north trending vein system (Moffit and Mertie, 1923).

Geologic setting:

Claims near the boundary of the Nikolai Greenstone and the tuffs and fine-grained basalts of the Strelna formation to the east. The diorite mass that makes up Granite Mountain lies eastward (Moffit and Mertie, 1923). Mineralization associated with quartz occurs along joints and fissures in a shear zone which have been extensively faulted and crushed (Moffit, 1915).

Mineralization includes silver-bearing tetrahedrite, chalcopyrite, galena, and minor bismuthinite(?). Azurite and malachite are secondary minerals with the gangue consisting of quartz and barite. Assays of the tetrahedrite ore contains 0.08 to 2.4% Ag (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

USGS

- Assays taken of the ore around 1916 reported values ranging from 25 to 700 oz. per ton Ag and 1 to 32% Cu (Moffit and Mertie, 1923).

BLM

- Two adits and a small ore stockpile located and samples collected during 1997. This area has had extensive stripping done by the Barry Brothers.

Lower Adit

Adit caved at the portal but appeared that with a little work could be reopened. This adit is located 150 to 200 yards west of the upper adit. Mineralization consisted of bornite and chalcopyrite in a quartz and calcite matrix.

Latitude N 61° 44' 18"; Longitude W 143° 54' 09"; Elevation 4,875 ft.

Sample AAWSE 10036 was collected outside the portal and contained 513 ppm Cu and 31.2 ppm Ag.

Upper Adit

Adit open, driven N. 15° W. for 50 ft. through sheared iron-stained basalts. Adit driven along a 6 in. wide shear zone which does not extend to the end of the adit. Mineralization consists of malachite, azurite, bornite, chalcopyrite, and arsenopyrite.

Latitude N 61° 44' 19"; Longitude W 143° 54' 07"; Elevation 4,915 ft.

Sample AAWSE 10035 was collected from the waste dump contained 2.6% Cu, 1,677.1 ppm Ag, over 2,000 ppm Sb, 3,060 ppm Zn, 158 ppm Pb, and 177 ppb Au.

Ore Stockpile

Located an ore stockpile above the lower adit on an open cut along the road. Material consisted of quartz and calcite containing veinlets and blebs of bornite, chalcopyrite, arsenopyrite, and galena.
Latitude N 61° 44' 18"; Longitude W 143° 54' 13"; Elevation 4,955 ft.
Sample AAWSE 10034 contained 5,811 ppm Cu, 618.4 ppm Ag, over 2,000 ppm Sb, 989 ppm Zn, 404 ppm Pb, and 20 ppb Au.

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STRELNA CREEK

MAS no: 0020870062 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: At approximately the 3,650 ft. elevation of Strelna Creek, a northern tributary of the Kuskulana River. Located on the southeast side of the Elliott Creek pass.

Township: 003 S. ***Range:*** 008 E. ***Section:*** 09
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1901 - Claims staked (KX 87-030).

Operating data:
Prospecting pit on an altered fault zone in the Nikolai Basalt (U.S. Bureau of Mines, 1978).

Geologic setting:
Faulted massive Chitistone Limestone and Nikolai Greenstone with a 40 ft. wide mineralized zone associated along the contact. Mineralization includes bornite, chalcopyrite, and native copper (Schrader and Spencer, 1901). A 6 to 8 ft. wide fault in the greenstone contained pyrite and shows malachite staining (Moffit and Maddren, 1908).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.
  Estimated location:
  Latitude N 61° 37' 14"; Longitude W 143° 58' 54"; Elevation 3,650 ft.

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MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

SURPRISE CREEK

MAS no: 0020860191 *Figure no.* 3

Ownership and Location:

Alternate name(s):
Nerelna Creek
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu

Location: At approximately the 3,390 ft. elevation on the east side of Surprise Creek, a southern tributary of Nerelna Creek.

Township: 005 S. ***Range:*** 006 E. ***Section:*** 36
Quadrangle: Valdez B-1 ***Meridian:*** Copper River
Mining district: Nizina ***Mineral status:*** Development prospect

Development and Geology:

History and production:
1911 - A short tunnel has been driven (Moffit, 1914).

Operating data:
One short tunnel (Moffit, 1912).

Geologic setting:
Shattered zone of Skolai greenstone associated with schist and highly altered siliceous thin-bedded limestone. The fractures in the zone are veined with intergrowths of quartz and epidote. Ore mineralization includes chalcopyrite, pyrite, chrysocolla, chalcocite, and bornite disseminated through the greenstone (Moffit, 1912).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located during 1997.

References:

Bibliography:
ALASKA KARDEX 86-136

Moffit, F.H., 1912, The Taral and Bremner River districts, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1911: U.S. Geological Survey Bulletin 520, p. 102-103.

-----1914, Geology of the Hanagita-Bremner region, Alaska: U.S. Geological Survey Bulletin 576, p. 52.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 62-63.

Cobb, E.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Valdez quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-438, no. 58.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected nonmetalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 81.

U.S. Bureau of Mines, 1978, Mineral appraisal of the Wrangell-St. Elias region: A summary report: U.S. Bureau of Mines Open-File Report 64-78, p. 31.

Winkler, G.R., Miller, R.J., MacKevett, E.M., Jr., and Holloway, C.D., 1981, Map and summary table describing mineral deposits in the Valdez quadrangle, southern Alaska: U.S. Geological Survey Open-File Report 80-892-B, no. 49.

TRAIL CREEK

MAS no: 0020780052 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: Located at the 4,750 ft. elevation of the northeastern tributary of Trail Creek headwaters, southwestern Noyes Mountain.

Township: 010 N. *Range:* 012 E. *Section:* 30
Quadrangle: Nabesna C-5 *Meridian:* Copper River
Mining district: Tok *Mineral status:* Raw prospect

Development and Geology:

History and production:

1931 - Located and staked by N.P. Nelson and E.G. LaBell.
- Prospecting carried out during the winter (Moffit, 1941).

Operating data:

None reported.

Geologic setting:

Headwaters within Mesozoic shale, sandstone, and conglomerate intruded by dikes and sills. The majority of the stream gravels are derived from these sedimentary rocks. The source of the gold has not been located (Moffit, 1941).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Located and sampled in 1997.

No placer workings were identified on the ground during the 1997 field season. The entire creek was over flown to look for any signs of a placer operation. There may have been prospecting in the past but no evidence of placer mining exists in the stream drainage. Three samples were collected in the drainage with very minor gold recovery in the samples.

Samples AAWSE 10029 and AAWSE 10030 were collected in the main drainage above and below the northeast tributary and sample AAWSE 10031 was collected in the northeast tributary below the Trail Creek shear.

Sample AAWSE 10029. 1/10 cubic yard of material processed. Float contained basalt diabase, greenstones, and limestones. 4 to 5 fine gold specks noted, ½ -1 mm in size. Sample contained 4,321 ppb Au and 69 ppm Cu.
Latitude N 62° 36' 31.269"; Longitude W 143° 15' 53.990"; Elevation 4,185 ft.

Sample AAWSE 10030. 1/10 cubic yard of material processed. Float consisted of basalt diabase with no limestone present. Recovered 2 small gold specks. The sample contained

1,144 ppb Au and 68 ppm Cu.
Latitude N 62° 37' 52.411"; Longitude W 143° 16' 17.473"; Elevation 4,535 ft.
Sample AAWSE 10031 taken from Trail Creek. 1/10 cubic yard of material processed. A fair amount of clay was encountered. Very little black sands and no garnets present. Recovered 2 gold specks. Sample contained 3,122 ppb Au, 0.3 ppm Ag, and 73 ppm Cu.
Latitude N 62° 37' 18.058"; Longitude W 143° 14' 45.160"; Elevation 4,470 ft.

Recommendations:

It is apparent that due to no identified workings located in the stream drainage and from the low gold values recovered from the three placer samples collected, that the possibility of historical placer mining in Trail Creek is highly unlikely and the potential for future placer gold mining is very low to non-existent.

References:

Bibliography:

Moffit, F.H., 1941, Geology of the upper Tetling River district, Alaska: U.S. Geological Survey Bulletin 917-B, p. 154-155.

Matson, N.A., Jr., and Richter, D.H., 1971, Geochemical data from the Nabesna C-5 quadrangle, Alaska: U.S. Geological Survey Open-File Report 473 (71-204), p.10.

Richter, D.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-422.

TRAIL CREEK CIRQUE

MAS no: 0020780005 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Unnamed occurrence
Company name(s):
Mineral survey(s):

Commodity: Copper, lead, silver
Deposit type: Polymetallic vein

Location: At approximately the 6,000 ft. elevation on the south side of a cirque along the east side of Trail Creek.

Township: 010 N. ***Range:*** 012 E. ***Section:*** 30
Quadrangle: Nabesna C-5 ***Meridian:*** Copper River
Mining district: Tok ***Mineral status:*** Raw prospect

Development and Geology:

History and production:
None reported.

Operating data:
None reported.

Geologic setting:
See report.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Looked for but not located in 1997.

A massive boulder, 12 in. in diameter, of chalcopyrite was located on the south side of the cirque along a medial moraine. The source of the boulder was not located but appears to have come from the south side of the mountain above its resting place. The area was too steep and dangerous to climb to find the source.
Sample location:
Latitude N 62° 37' 04.857"; Longitude W 143° 13' 32.991"; Elevation 5,400 ft.
Sample AAWSE 10021 collected from the boulder contained 17 ppb Au, 0.9 ppm Ag, and 3,301 ppm Cu.
A 30 ft. thick shear zone west of the boulder is made up of a 10 to 12 ft. thick bed of shale overlain by a 30 ft. thick bed of horndblendite at the 5,360 ft. elevation.
Sample AAWSE 10020 collected from the shale contained 42 ppm Cu.

References:

Bibliography:

Richter, D.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-422.

TRAIL CREEK SHEAR

MAS no: 0020780133 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Basaltic Cu
Patent number(s):

Location: Located at the 4,620 ft. elevation along the north side of the northeastern most tributary of Trail Creek.

Township: 010 N. *Range:* 012 E. *Section:* 30
Quadrangle: Nabesna C-5 *Meridian:* Copper River
Mining district: Tok *Mineral status:* Raw prospect

Development and Geology:

History and production:
None reported.

Operating data:
None reported.

Geologic setting:
Headwaters within Mesozoic shale, sandstone, and conglomerate intruded by dikes and sills (Moffit, 1941).

Recent investigations:

USGS/USBM/BLM work:
BLM
- Located and sampled in 1997.

Bedrock consisted of highly sheared and weathered argillite intruded by mineralized basaltic dikes. This zone is cut by the stream and extends for approximately ¼ mile. Latitude N 62° 37' 22.885"; Longitude W 143° 14' 20.517"; Elevation 4,670 ft.

Samples AAWSE 10010 and 10011 collected from the two dikes, up to 12 in. wide, contained pyrite and chalcopyrite mineralization. Sample AAWSE 10010 contained 123 ppm Cu and sample AAWSE 10011 contained 40 ppm Cu.

Sample AAWSE 10012 collected from a 1 to 2 in. wide shear zone contained 80 ppb Au, 0.5 ppm Ag, and 21 ppm Cu.

Sample AAWSE 10013 taken of the argillite, between samples AAWSE 10011 and AAWSE 10012, to obtain general background levels contained 14 ppb Au and 135 ppm Cu.

References:

Bibliography:

Moffit, F.H., 1941, Geology of the upper Tetling River district, Alaska: U.S. Geological Survey Bulletin 917-B, p. 154-155.

UNNAMED OCCURRENCE

MAS no: 0020780008 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Copper
Deposit type: Unknown

Location: At approximately the 3,200 ft. elevation along a tributary of Jack Creek, on the south side of Devils Mountain.

Township: 007 N. ***Range:*** 013 E. ***Section:*** 02
Quadrangle: Nabesna B-4 ***Meridian:*** Copper River
Mining district: Chisana ***Mineral status:*** Raw prospect

Development and Geology:

History and production:
None reported.

Operating data:
None reported.

Geologic setting:
Boulders, up to 3 x 5 x 3 ft., of massive pyrrhotite and chalcopyrite in a matrix of actinolite and garnet located in local glacial deposits (Richter and Matson, 1969).

Recent investigations:

USGS/USBM/BLM work:
USGS
- Stream geochemical survey had four samples containing 70 ppm copper (Richter and Matson, 1969).

BLM
- Not looked for in 1997.

References:

Bibliography:
Richter, D.H., and Matson, N.A., Jr., 1969, Geochemical data from the Nabesna B-4 quadrangle, Alaska: U.S. Geological Survey Open-File Report 69-224 (366), 8 p.

-----1972, Metallic mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-422.

UNNAMED OCCURRENCE

MAS no: 0020780081 *Figure no.* 2

Ownership and Location:

Alternate name(s):
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Granitoid-host Au

Location: At approximately the 3,400 ft. elevation of an eastern tributary of Notat Creek.

Township: 010 N. *Range:* 010 E. *Section:* 26
Quadrangle: Nabesna C-6 *Meridian:* Copper River
Mining district: Chistochina *Mineral status:* Development prospect

Development and Geology:

History and production:

1938 - One claim staked (KX 78-024).
1942 - Caved adit located (Moffit, 1954).

Operating data:

1942 - Adit driven N. 65° E. for unknown length, caved (Moffit, 1954).

Geologic setting:

Area mapped as Permian volcanic rocks. A trachyte dike 8 ft. thick, striking N. 55° W. and dipping 45° NE., cuts diorite gneiss. Stringers of quartz, calcite, pyrite, galena, and sphalerite, ¼ to 2 in. thick, form a 6 to 12 in. wide vein zone (Moffit, 1954). Gold content of veins unknown (Moffit, 1954).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Looked for but no evidence of workings or mineralization located in 1997. This property reference may be the property located in the middle fork of Caribou Creek (78-03).

References:

Bibliography:

ALASKA KARDEX 78-024

Moffit, F.H., 1941, Geology of the upper Tetling River district, Alaska: U.S. Geological Survey Bulletin 917-B, p. 155.

-----1954, Geology of the eastern part of the Alaska range and adjacent area: U.S. Geological Survey Bulletin 989-D, p. 203.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 47.

Richter, D.H., and Matson, N.A., Jr., 1972, Metallic mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-422.

VICKI

MAS no: 0020780080 ***Figure no.*** 2

Ownership and Location:

Alternate name(s):
Vicki # I
Vince # I-II
Company name(s):
Mineral survey(s):

Commodity: Gold
Deposit type: Placer

Location: Near the mouth of Rock Creek, a tributary of Caribou Creek.

Township: 009 N. ***Range:*** 010 E. ***Section:*** 11
Quadrangle: Nabesna C-5 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Exploration prospect

Development and Geology:

History and production:
1971 - Three claims staked by Vincent Coan (KX 78-092).

Operating data:
None reported.

Geologic setting:
None reported.

Recent investigations:

USGS/USBM/BLM work:
BLM
- Not looked for in 1997.

References:

Bibliography:
ALASKA KARDEX 87-092

WAR EAGLE

MAS no: 0020870057 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Agnus MacDougall
Apex Lode
Boden Lode
Byron Lode
Climax Lode
Crystalight Lode
Dalton Lode
Globe Lode
Gopher Lode
Highball Lode
Hilltop Lode
Humboldt Lode
Phoenix Lode
Tiptop Lode
Transport Lode
Big Foot Creek
MacDougall Creek

Company name(s):
Chitina-Kuskulana Copper Co.
Theo. F. Van Wagen

Mineral survey(s):
M.S. 873 A&B

Commodity: Copper, iron
Deposit type: Carbonate-hosted Fe skarn

Patent Number(s):
300956

Location: Located at the 3,570 ft. elevation on the west side of MacDougall Creek (also named Bigfoot Creek), a southern tributary of the Kuskulana River.

Township: 003 S. ***Range:*** 009 E. ***Section:*** 34
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect/Patented

Development and Geology:

History and production:
1909 - Twenty-one claims (5 mill sites and 16 lode claims) staked by Agnus MacDougall (KX 87-046).
1912 - Patented November 19, 289.0905 acres.
1919 - Development work done, tunnel driven 104 ft. (Van Alstine and Black, 1946).

Operating data:
A 104 ft. long tunnel driven in a south-southeasterly direction (Van Alstine and Black, 1946).

Geologic setting:
Most of MacDougall Creek is made up of granodiorite but the mineralized area consists of

Jurassic conglomerate, sandstone, shale, Chitistone Limestone, and the overlying Triassic shales (Kuskulana Formation) (Van Alstine and Black, 1946).

Tunnel driven south-southwesterly in a white silicified limestone broken by numerous joints and slips. An 8 to 12 in. thick mineralized dike contains pyrite and chalcopyrite and is malachite stained. The copper minerals are contact-metamorphic minerals from the intrusion of the diorite. Magnetite bodies are exposed between the tunnel and base of the conglomerate (Moffit and Mertie, 1923). Mineralization consists of pyrite, pyrrhotite, chalcopyrite, epidote, chlorite, calcite, and quartz in diopside rock (Berg and Cobb, 1967).

Recent investigations:

USGS/USBM/BLM work:

USGS

- An assay of the diopside contained 62.07% Fe (Berg and Cobb, 1967).

BLM

- Located and sampled during 1997.

Adit caved, appeared to be driven N. 48° E. Mineralization consists of chalcopyrite, minor bornite, and disseminated pyrite. All buildings of the "middle camp" located 200 ft. below the adit are collapsed.

Latitude N 61° 33' 32.068"; Longitude W 143° 44' 36.985"; Elevation 3,570 ft.

Sample AAWSE 10061 collected from the waste dump contained over 10% Fe, 876 ppm Cu, 0.8 ppm Ag, and 42 ppb Au.

Resources:

USGS

- 1967 - Less than 10,000 tons of 62.07% Fe (Berg and Cobb, 1967).

References:

Bibliography:

ALASKA KARDEX 87-046a

ALASKA KARDEX 87-048

Moffit, F.H., 1915, Mineral deposits of the Kotsina-Kuskulana district, with notes on mining in Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1914: U.S. Geological Survey Bulletin 622, p. 114.

-----1918, Mining in the lower Copper River basin, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1916: U.S. Geological Survey Bulletin 662, p. 160.

-----1921, Mining in Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1919: U.S. Geological Survey Bulletin 714, p. 192.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 137-139.

Moffit, F. H., 1924, The metalliferous deposits of the Chitina valley, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1922: U.S. Geological Survey Bulletin 755, p. 65-66.

-----1938, Geology of the Chitina valley and adjacent area, Alaska: U.S. Geological Survey Bulletin 894, p. 117, 122-123, 126.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 42.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 28.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected non-metalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 34.

WARNER

MAS no: 0020870055 ***Figure no.*** 3

Ownership and Location:

Alternate name(s):
Galena-Nikolai Holding
McClellan Lode
Warner Lode
Warner Prospect

Company name(s):
Chittyna Exploration Co.
Nikolai Mining Co.

Owner:
Daryl Reindle
P.O. Box 101048
Anchorage, AK 99510

Mineral survey(s):
M.S. 547

Commodity: Copper
Deposit type: Basaltic Cu

Location: At approximately the 2,550 ft. elevation on the west side of the lower part of Rock Creek, a southern tributary of the Kotsina River. The location of the Mineral Survey on the Master Title Plat is located in the wrong section and should not be section 16.

Township: 002 S. ***Range:*** 008 E. ***Section:*** 09
Quadrangle: McCarthy C-8 ***Meridian:*** Copper River
Mining district: Chistochina ***Mineral status:*** Development prospect/Patented

Development and Geology:

History and production:

1899 - Warner and McClellan Lodes claims located, July 9, by the Chittyna Exploration Co.
- Claims recorded September 4.

1901 - Mineral Survey 547 surveyed, August 14-18, for the Chittyna Exploration Co. Claims include the Warner and McClellan Lodes.

1904 - Two claims staked by John H. Huber (KX 87-031).

1907 - Patented (Moffit and Maddren, 1908).

1922 - Development work done (Moffit and Mertie, 1923).

Operating data:

In 1901 Mineral Survey 547 reported a discovery shaft, 4 x 6 ft., 12 ft. deep; an open cut, 20 x 50 ft., 60 ft. deep; a tunnel, 4 x 7 ft., 22 ft. long; a crosscut, 12 x 15 ft., 15 ft. deep; and another crosscut, 5 x 20 ft.

Stripping - 25 x 40 ft. area (Mendenhall and Schrader, 1903).

A 25 ft. tunnel driven S. 35° W. (Moffit and Mertie, 1923).

Geologic setting:

Bedrock is Nikolai Greenstone in contact with the overlying Chitistone Limestone. A 3 to 3.5 ft. wide crushed calcite fault zone trends S. 35° W. is stained with malachite and contains small

irregular bodies of bornite and chalcopyrite scattered along the fault. The 25 ft. adit was driven along the fault zone (Moffit and Mertie, 1923).

Recent investigations:

USGS/USBM/BLM work:

BLM

- Looked for but not located during 1997.
  Estimated location:
  Latitude N 61° 42' 15"; Longitude W 143° 57' 20"; Elevation 2,550 ft.

References:

Bibliography:

ALASKA KARDEX 87-031

Schrader, F.C., and Spencer, A.C., 1901, The geology and mineral resources of a portion of the Copper River district, Alaska; U.S. Geological Survey Special Publication 5, p. 85.

Mendenhall, W.C., and Schrader, F.C., 1903, The mineral resources of the Mount Wrangell district, Alaska: U.S. Geological Survey Professional Paper 15, p. 18, 20.

Mendenhall, W.C., 1905, Geology of the central Copper River region, Alaska: U.S. Geological Survey Professional Paper 41, p. 94-95.

Moffit, F.H., and Maddren, A.G., 1908, The mineral resources of the Kotsina and Chitina valleys, Copper River region, *in* Brooks, A.H., and others, Mineral resources of Alaska, report on progress of investigations in 1907: U.S. Geological Survey Bulletin 345, p. 138.

-----1909, Mineral resources of the Kotsina-Chitina region, Alaska: U.S. Geological Survey Bulletin 374, p. 55.

Moffit, F.H., and Mertie, J.B., Jr., 1923, The Kotsina-Kuskulana district, Alaska: U.S. Geological Survey Bulletin 745, p. 104-105.

Berg, H.C., and Cobb, E.H., 1967, Metalliferous lode deposits of Alaska: U.S. Geological Survey Bulletin 1246, p. 44.

Heiner, L.E., Wolff, E.N., and Grybeck, D., 1971, Copper mineral occurrences in the Wrangell Mt. - Prince William Sound area, Alaska: Mineral Industry Research Laboratory Report 27, p. 78.

MacKevett, E.M., Jr., and Cobb, E.H., 1972, Metallic mineral resources map of the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-395.

MacKevett, E.M., Jr., 1976, Mineral deposits and occurrences in the McCarthy quadrangle, Alaska: U.S. Geological Survey Miscellaneous Field Studies Map MF-773-B.

MacKevett, E.M., Jr., and Holloway, C.D., 1977, Table describing metalliferous and selected non-metalliferous mineral deposits in eastern southern Alaska: U.S. Geological Survey Open-File Report 77-169A, p. 35.