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MINERAL SAMPLING IN THE WESTERN PORTION OF THE SOUND STUDY AREA, CHUGACH NATIONAL FOREST, ALASKA

by:

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UNITED STATES DEPARTMENT OF THE INTERIOR

Donald P. Hodel, Secretary

BUREAU OF MINES

Robert C. Horton, Director

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

yd^3	cubic yard(s)	m.y.	million years
ft	feet	oz	ounce(s)
in.	inch(es)	pct	percent
mi	mile(s)	ppm	parts per million

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by Mark P. Meyer[1/] and Steven A. Fechner [2/]

ABSTRACT

A mineral investigation of the Chugach National Forest, Alaska was conducted jointly by the U.S. Geological Survey and the U.S. Bureau of Mines from 1979 to 1983 as part of the RARE II program. The U. S. Geological Survey remapped the geology and distribution of mineral resources. The Bureau investigated mines, prospects, and mineral occurrences.

Previously unreported mineralization in three areas, Long Bay, Wells Bay, and Miners River were discovered in the western portion of the SOUND study area. Copper, lead, zinc, gold, silver, nickel, cobalt, fluorite, and arsenic were found in north-northeast to north-northwest trending shear zones, veins, felsic dikes, and granitic intrusives in Tertiary Orca Group metasedimentary rocks.

INTRODUCTION

The Bureau of Mines (Bureau) and the U.S. Geological Survey (USGS) conducted a four-year (1979 to 1982) mineral appraisal of the Chugach National Forest (CNF), Alaska (fig. 1) as part of the Roadless Area Review and Evaluation (RARE II) study (Public Law 94-588). The USGS

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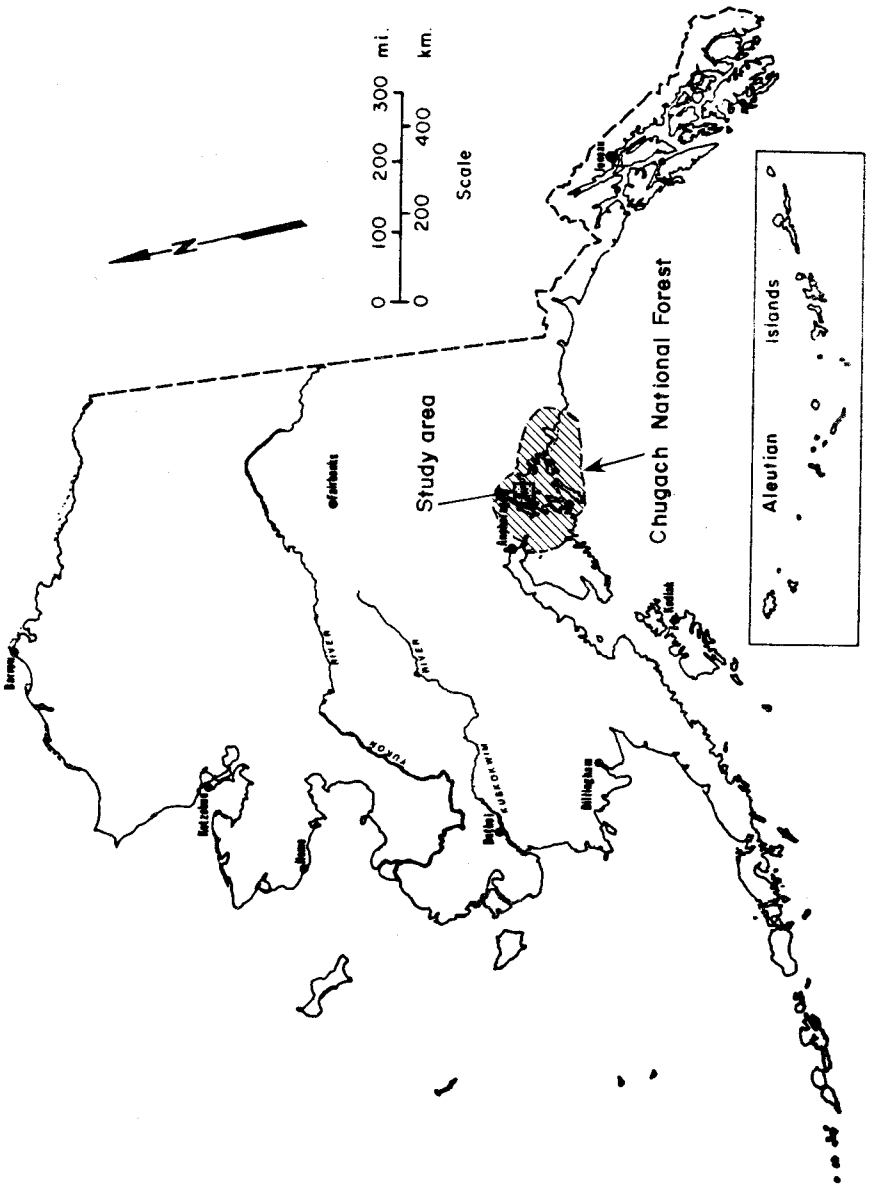

FIGURE 1. - Location map of the western portion of the SOUND study area, Chugach National Forest, Alaska

compiled and evaluated data on the regional geology, geochemistry, and geophysics. The Bureau compiled and evaluated data on mines, prospects, mineral occurrences, and areas of mineralization. More detailed and comprehensive Bureau reports (MLA 5-84) on the investigations of mines, prospects, and their geologic setting will be completed later. A joint USGS/Bureau summary report, published by the USGS as MF-1645A, describes geology, geophysics, geochemistry, and the mineral resource potential of the study area.

To facilitate the appraisal, the Bureau subdivided the CNF into three study areas: PENINSULA, ISLANDS, and SOUND [3/] (fig. 2). This report presents results of the Bureau's reconnaissance sampling and investigations in the western portion of the SOUND study area (fig. 3).

ACKNOWLEDGMENTS

The authors wish to acknowledge the cooperation of the USGS personnel, led by Steve Nelson, who worked on the RARE II project. Analytical support was provided by TSL Labs, Opportunity, WA; Skyline and Rainbow Resource Labs, Anchorage, AK; and the Bureau Research Centers at Albany, OR, and Reno, NV.

LOCATION AND ACCESS

The SOUND study area comprises approximately 2.8 million acres. The western portion of the study area, as discussed in this report, encompasses approximately 95,000 acres and includes the area from Unakwik

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3/SOUND study area is the Bureau of Mines unofficial designation for the eastern half of the Chugach National Forest.

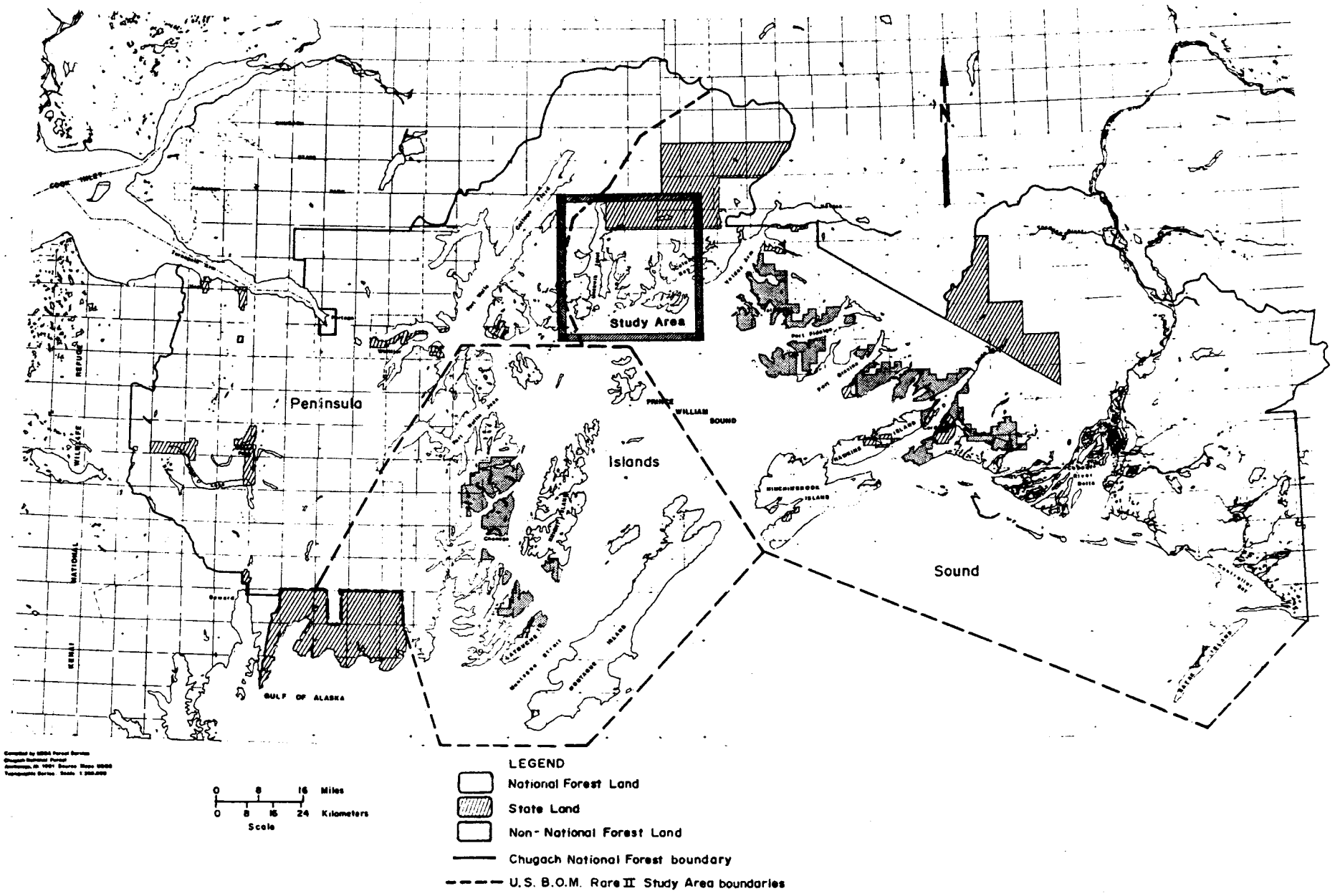


FIGURE 2. - Land status and Bureau of Mines study area map of the Chugach National Forest, Alaska.

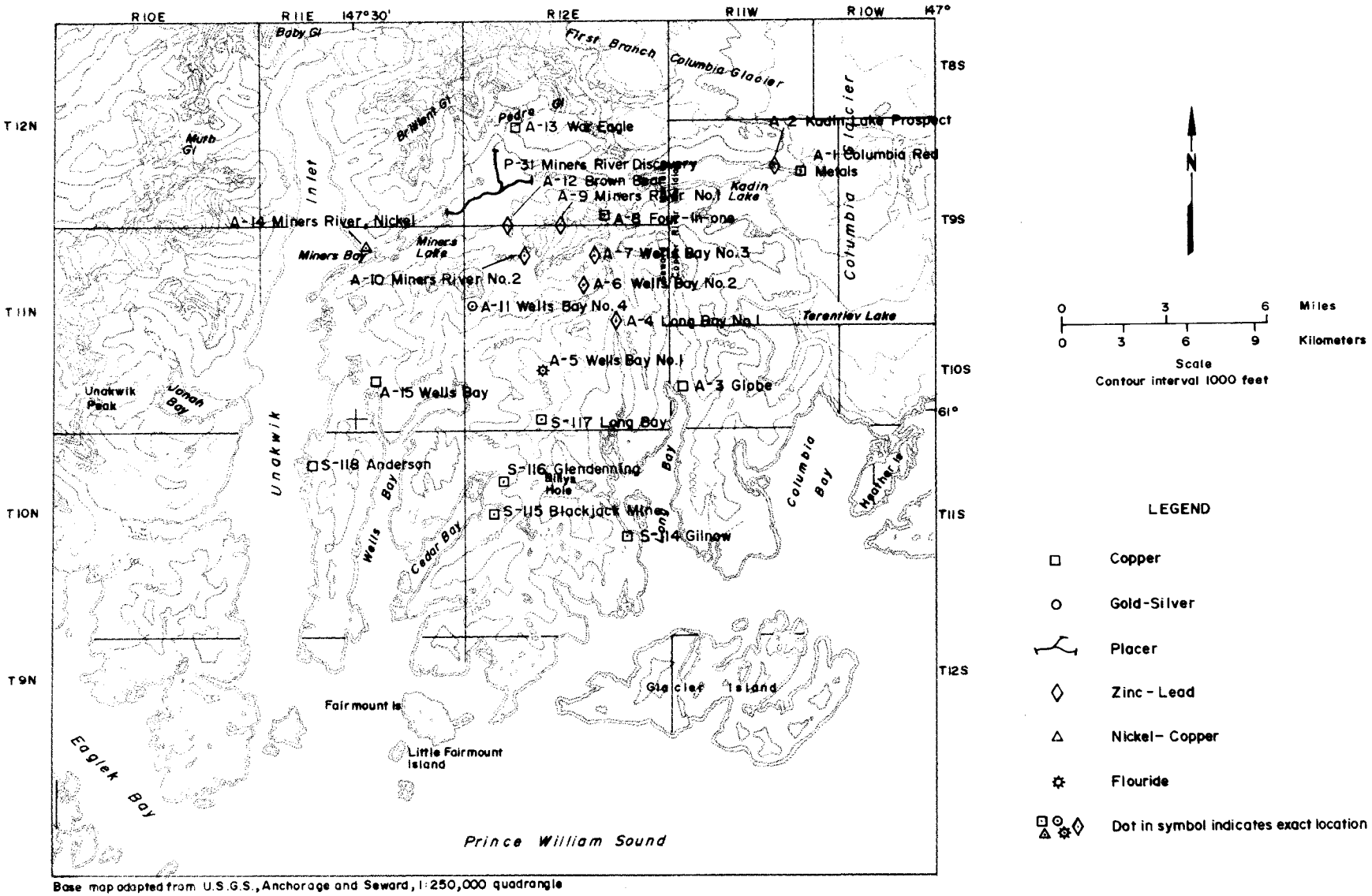


FIGURE 3. - Prospect and occurrence location map of the western portion of the SOUND study area, Chugach National Forest, Alaska.

Inlet on the west to Columbia Glacier on the east and from the mouth of Wells Bay on the south to Pedro Glacier on the north (fig. 3). Because there are no roads to the area, access is limited to boats, helicopters, and float planes.

PHYSIOGRAPHIC SETTING

The western portion of the SOUND study area is within the Kenai-Chugach Mountains section of the Pacific Border Ranges Physiographic Province (1) [4/]. The area is rugged with up to 4,200 ft of relief. Glaciers are present on the higher mountains. Long north-south trending fiords indent the southern coast. Vegetation consists of spruce forests and muskeg in the low lying areas, and tundra above the 1,500 elevation.

LAND STATUS

The western portion of the SOUND study area in the central part of the CNF consists of approximately 95,000 acres and contains federal and state lands (fig. 2). State land occurs northeast of the cities of Valdez and Cordova, and the Rude and Miners Rivers. Private land occurs around Valdez, Cordova, along much of the coast, and as isolated groups of patented mining claims. The remaining land is federally owned and managed by the U.S. Forest Service (USFS).

4/Underlined numbers in parentheses refer to items in the list of references at the end of this report.

MINING HISTORY

Prospecting in the area began in 1897, but it was not until 1904 that the first prospect was staked. Copper, lead, zinc, gold, silver, and nickel occurrences were discovered and worked sporadically from 1904 until the 1940's, but no mineral production has been recorded from the area.

As of December 1984, no active mining operations occur in the area.

PREVIOUS STUDIES

F. C. Schrader of the USGS (2) was the first to describe the geology of the western portion of the SOUND study area. Starting in 1906 the USGS has studied the geology and mineral deposits in the area and have reported on these in various reports (3-15). In 1964, Plafker and MacNeil (16), dated the Orca Group as Tertiary by the use of fossils. Plafker (17-18) also studied the tectonic effects of the 1964 Alaska earthquake in the area. Geologic maps of the Seward Quadrangle have been published by the USGS (19-27). In the 1970's the USGS studied the possible origins of the rocks of the Orca and Valdez Groups (28-32). The USGS Alaska Mineral Resource Assessment Program (AMRAP) studies have been and are being conducted in the Seward and Anchorage Quadrangles (19-21, 26-27), which cover the area.

The Territory of Alaska Department of Mines and the State of Alaska Department of Natural Resources have conducted site specific examinations in the area (33-35) which included mapping and sampling of the Four-in-One Mine and A. D. Thompson's Brown Bear property, both in the Miners River drainage.

The Bureau conducted site specific and regional investigations in the western portion of the SOUND study area during 1944 which included examinations of the Blackjack claims in Cedar Bay, and the Miners Bay nickel prospect (36-37). Recent Bureau investigations in the area are the subject of several reports (38-40). A summary of USGS and Bureau work completed in the RARE II study has been published by the USGS (42).

GEOLOGIC SETTING

The western portion of the SOUND study area is underlain by Tertiary Orca Group metasedimentary and metavolcanic rocks and Tertiary intrusive rocks.

The Orca Group metasedimentary rocks are interpreted as representing a widespread, thick, and complexly deformed accretionary sequence of flysch and tholeiitic basalt in fault contact with the southern margin of the Valdez Group (32). The thickness of the Orca Group is estimated as many thousands of feet (32). The Group has mostly been metamorphosed to the zeolite or prehnite-pumpellyite facies; however, rocks adjacent to the contact fault may be metamorphosed to the greenschist facies (32).

Intrusive rocks in the area include granitoid plutons and dikes. The granitoid plutons are near Cedar, Miners, and Columbia Bays and near Terentiev Lake. The ages of the plutons are reportedly correlative with the ages of other Tertiary plutons intruding the Orca Group which is approximately 50 m.y. (30). Dikes are present throughout the area, but no information as to the extent and nature of the dikes is available.

Structurally, the Orca Group has been complexly faulted, folded, and commonly overturned in various directions. The Contact Fault zone,which extends from Mt. St. Elias to Kodiak Island, is the major structural feature in the area. The fault zone consists of northward-dipping reverse faults, which separate the Tertiary Orca Group from the Cretaceous Valdez Group. The trace of the fault is projected through the Miners River drainage.

PRESENT INVESTIGATIONS

The Bureau's investigations in the study area were conducted from 1979 to 1982. Both literature search and field studies were included.

The literature search reviewed the following documents: 1) USGS publications, including a review of files in Menlo Park; 2) Bureau reports, published and unpublished which included Minerals Availability System (MAS) files; 3) USFS reports; and 4) Territory and State of Alaska reports and mining claim records from the MinFile (Kardex) recording system (43).

The Bureau's field investigation of the study area began in 1979, at which time stream sediment and rock samples were collected (38). Subsequent field investigations from 1980 to 1982 included: 1) reconnaissance sampling of geochemically anomalous terranes in search of previously unreported deposits; 2) mapping and sampling underground and surface prospect workings; 3) drilling at two locations using a 1-in.-core backpack diamond drill to obtain unweathered sulfide mineral samples for analysis (not for delineating the extent of mineralization); and 4) minor placer sampling. Approximately three

weeks were spent mapping and sampling the area. Six stream sediment, two placer, and one hundred sixty seven rock samples were taken (fig.4). The analytical results are listed in the appendix. Areas which contained copper, lead, zinc, nickel, cobalt, and arsenic values greater than 0.1 pct; gold values greater than 0.01 oz/ton; silver values greater than 0.5 oz/ton; fluorite; and placer gold values greater than 0.0005 oz/yd^3 were assigned occurrence names. The results of 1981 placer sampling in the area were summarized in a 1982 Bureau open-file report (39).

MINERAL PROPERTY TYPES

Twelve prospects, eight occurrences, and one placer gold property occur in the area (39). The mineral properties have been subdivided into the following types: 1) copper; 2) gold-silver; 3) placer gold; 4) zinc-lead; 5) nickel-copper; and 6) fluorite.

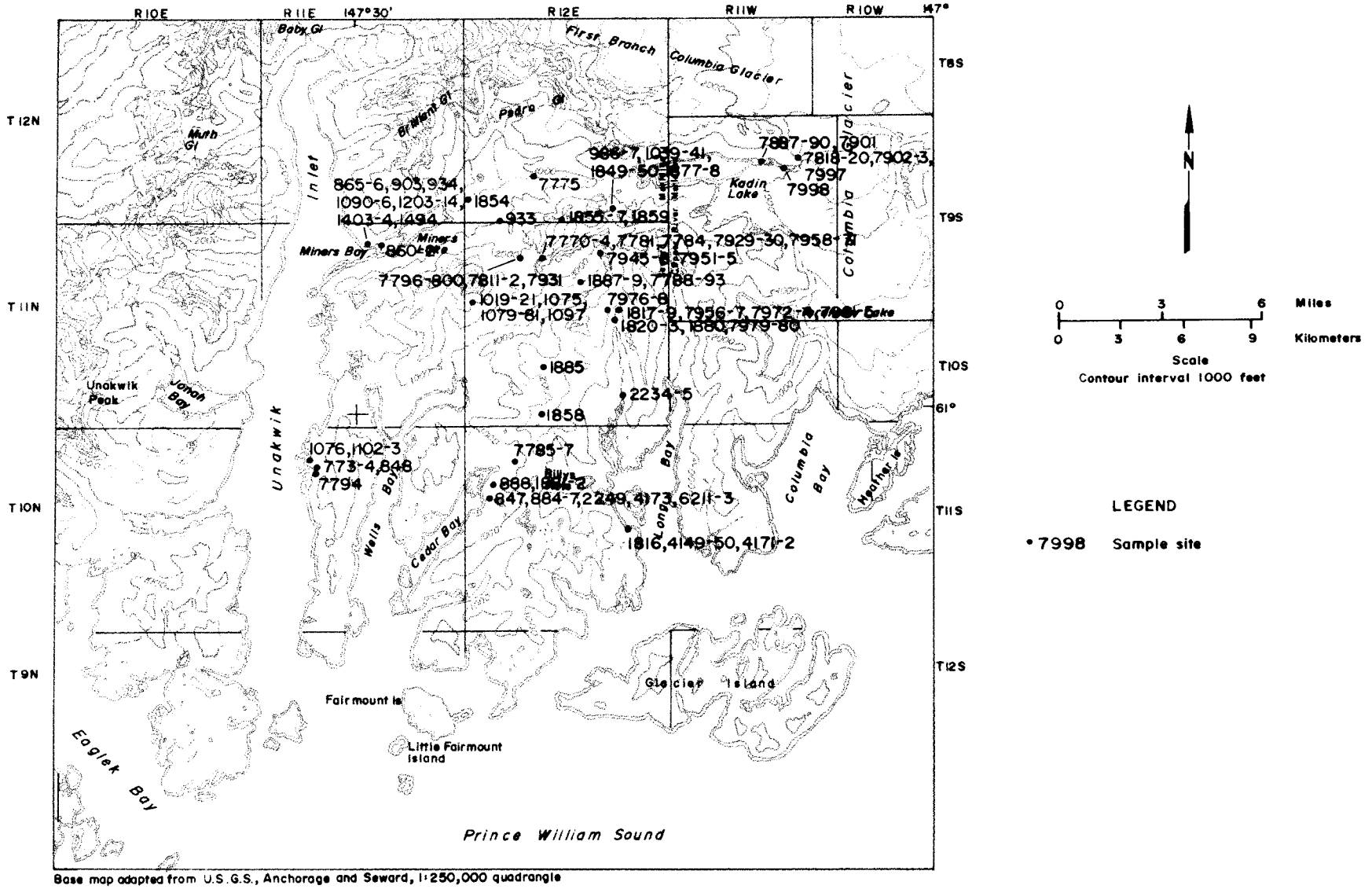
COPPER

Two types of copper properties occur in the study area; sediment-hosted and those associated with felsic intrusives.

Sediment-Hosted Properties

Seven copper prospects and one copper occurrence occur in sedimentary rocks (A-1, 3, 8, 13, 15, S-114, 117, and 118) 5/. Three pros-

5/Numbers with letter prefix in parentheses reference prospects and occurrences shown on the Prospect and Occurrence Location Map (fig. 3) and tabulated in the appendix.



Base map adapted from U.S.G.S., Anchorage and Seward, 1:250,000 quadrangle

FIGURE 4. - Sample location map of the western portion of the SOUND study area, Chugach National Forest, Alaska

pects and the occurrence were located, mapped, and sampled by the Bureau; Columbia Red Metals Group (A-1), Four-in-One (A-8), Gilnow (S-114), and Long Bay occurrence (S-117). Four prospects looked for but not located by the Bureau include; Globe (A-3), War Eagle (A-13), Wells Bay (A-15), and Anderson (S-118).

Columbia Red Metals Group Prospect

The Columbia Red Metals Group Prospect (A-1) consists of three prospect pits near Kadin Lake. Copper, silver, zinc, and lead mineralization occur in at least four shear zones. Three of the shear zones strike from N35°W to N35°E and dip from 65° to 80°N. The fourth shear zone strikes N70°E and dips 80°SE. The shear zones range from 3-in. to 18-ft in width and are traceable along strike for 800 ft. The mineralization ranges from 1-in.-wide veinlets of chalcopyrite and pyrite to 4-ft-wide zones of massive chalcopyrite. Disseminated galena, sphalerite, pyrite, and chalcopyrite also occur in a 4-ft-wide shear zone.

Seven samples were taken from the shear zones by Bureau personnel in 1982. Two 8-ft-long chip samples (7818-19) [6/] from one shear zone contained 0.12 pct and 700 ppm copper, 11.3 and 13.7 ppm silver, and 0.44 and 0.31 pct zinc. A selected grab sample (7820) from the shear zone contained 0.12 pct copper, 15.4 ppm silver, and 0.18 pct zinc. One 1-ft-long chip sample (7902) from another shear zone contained 0.11 pct copper, 12.6 ppm silver, 0.16 pct zinc, and 0.72 pct lead.

6/Numbers in parentheses reference sample results tabulated in the appendix.

Two 4-ft-long chip samples (7903, 7997) taken from a third shear zone contained 7.0 and 5.5 pct copper, 8.9 oz/ton and 75.2 ppm silver, and 0.25 and 0.67 pct zinc. One 4-ft-long chip sample (7998) from the fourth shear zone contained 0.12 pct copper, 19.7 ppm silver, 0.87 pct zinc, and 0.42 pct lead. Inferred reserve base includes: 6,600 tons at 0.095 pct copper, 12.5 ppm silver, 0.37 pct zinc, and 0.01 pct lead; 2,700 tons at 6.08 pct copper, 4.85 oz silver/ton, and 0.5 pct zinc; and 1,700 tons at 0.12 pct copper, 19.7 ppm silver, 0.87 pct zinc, and 0.42 pct lead.

Four-In-One Prospect

The Four-in-One Prospect (A-8) on the south side of Miners River consists of two mineralized shear zones: the Red and East Veins. The Red Vein strikes N25°W and dips 65°NE and is approximately 100-ft-wide. Mineralization consists of pyrite and chalcopyrite in quartz-calcite veinlets 1- to 12-in.-wide. The East Vein is located approximately 0.3 mi northeast of the Red Vein. The vein occurs along a 5- to 15-ft-wide silicified shear zone which strikes N5°E and dips 75°SE. The shear zone is traceable along strike for approximately 0.5 mi. Mineralization consists of veinlets of chalcopyrite, and pods of pyrite. The mineralization is present in zones up to 2-ft in width. Workings consist of a 60-ft crosscut (fig. 5) on the Red Vein and open pits on the East Vein.

Williams (35) sampled the prospect in 1954. An 8-ft-long chip sample taken of the Red Vein contained 0.79 pct copper, and trace amounts of gold and silver (35). A 9-ft-long chip sample on the East

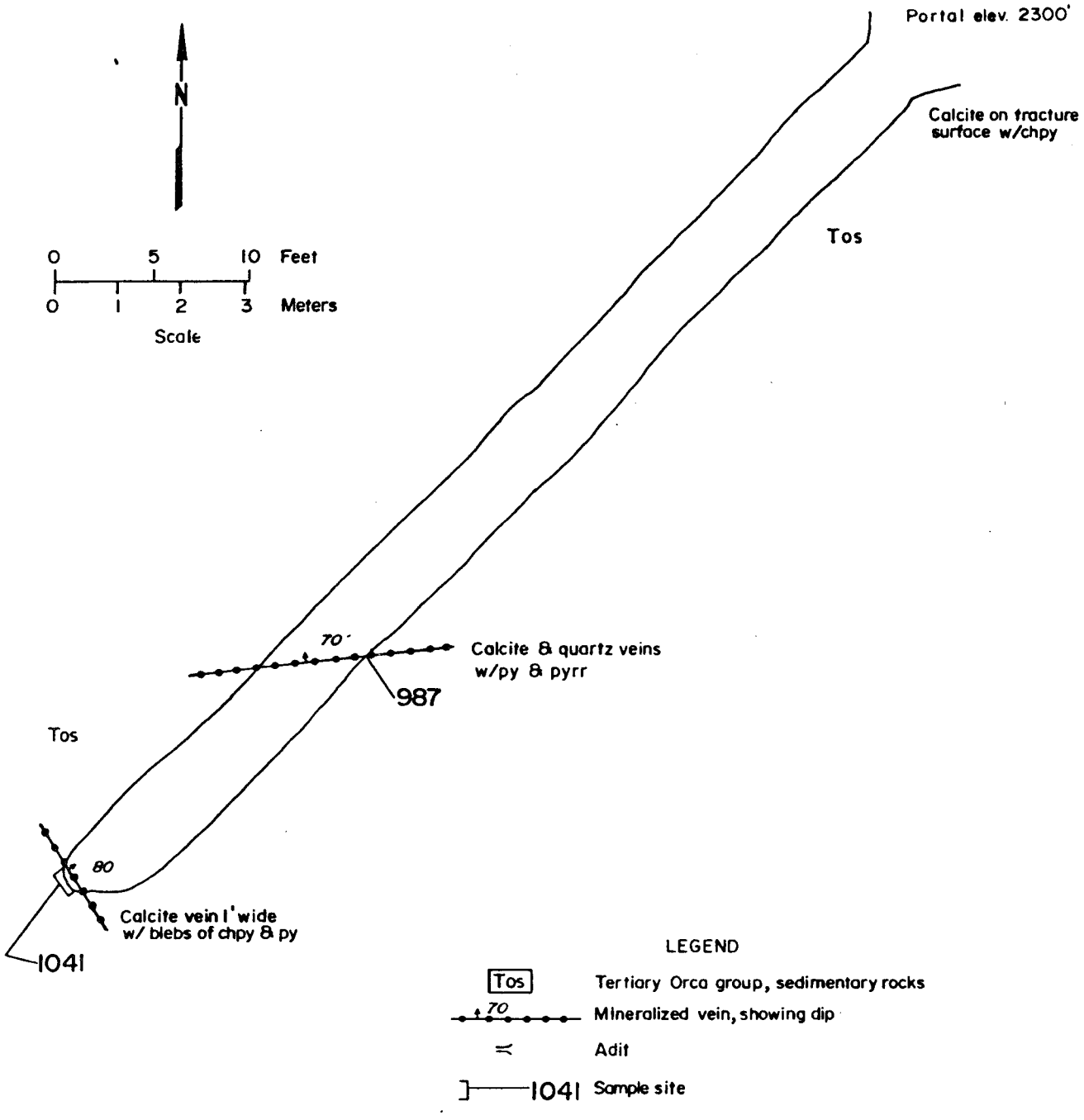


FIGURE 5. - Four-In-One Prospect, Red Vein adit sample locations.

Vein contained 0.22 pct copper, no gold, and a trace of silver (35). A high-grade grab sample contained 2.33 pct copper, 0.06 oz gold/ton, and a trace of silver (35). Bureau personnel examined the prospect in 1980 and 1981. At the Red Vein a grab sample (1039) from the west side of the shear zone contained 0.94 pct copper, 2.7 ppm silver, and 0.18 pct nickel. A 1-ft-long chip sample (1041) taken at the face of the adit contained 3.0 pct copper and 46 ppm silver. Sampling at the East Vein consisted of: 1) a 15-ft-long chip sample (1877) taken from the southern limit which contained 20 ppm copper and 2.6 ppm silver; 2) an 8-ft-long chip sample (1878) taken from the northern limit, which contained 690 ppm copper and 8.6 ppm silver; and 3) a 15-ft-long chip sample (1849) taken from the middle of the shear zone which contained 0.29 pct copper and 28.6 ppm silver. Inferred reserve base includes: Red Vein adit - 60 tons at 0.67 pct copper and 13.4 ppm silver; East Vein - 33,500 tons averaging 0.22 pct copper and 21.3 ppm silver.

Gilnow Prospect

The Gilnow Prospect (S-114) in Long Bay contains a limonite-stained shear zone which strikes N70°E and dips 90°. The shear zone is approximately 100-ft-wide. Mineralization consists of pyrrhotite disseminated in the shear zone. No workings were located on the prospect.

The Bureau examined the prospect in 1979 and 1981. A high-grade grab sample (1816) from the shear zone contained 33 ppm copper.

Long Bay Occurrence

The Long Bay occurrence (S-117) consists of a mineralized 10-ft-wide, north-south striking shear zone. Mineralization consists of 0.5-in.-wide veinlets of chalcopyrite.

Bureau personnel discovered and examined this occurrence in 1981. A grab sample (1858) taken from the shear zone contained 0.6 pct copper and 26 ppm silver.

Properties Associated With Felsic Intrusives

The Blackjack (S-115) and Glendenning (S-116) copper prospects are located on the east side of Cedar Bay, and are associated with the Cedar Bay granitic pluton. Mineralization at the two prospects appears to be associated with sheared silicified graywacke (?) roof pendants within the Cedar Bay pluton.

Blackjack Prospect

The Blackjack Prospect (S-115) consists of a mineralized silicified graywacke (?) along a 12-ft-wide shear zone within the Cedar Bay Granite. The shear zone strikes from N5°E to N5°W, dips 75°W, and is traceable for approximately 1 mi. Sulfide minerals in the shear consist of pyrite, pyrrhotite, sphalerite, and chalcopyrite. Two adits (fig. 6) are located on the prospect; one 42-ft-long and one 280-ft-long.

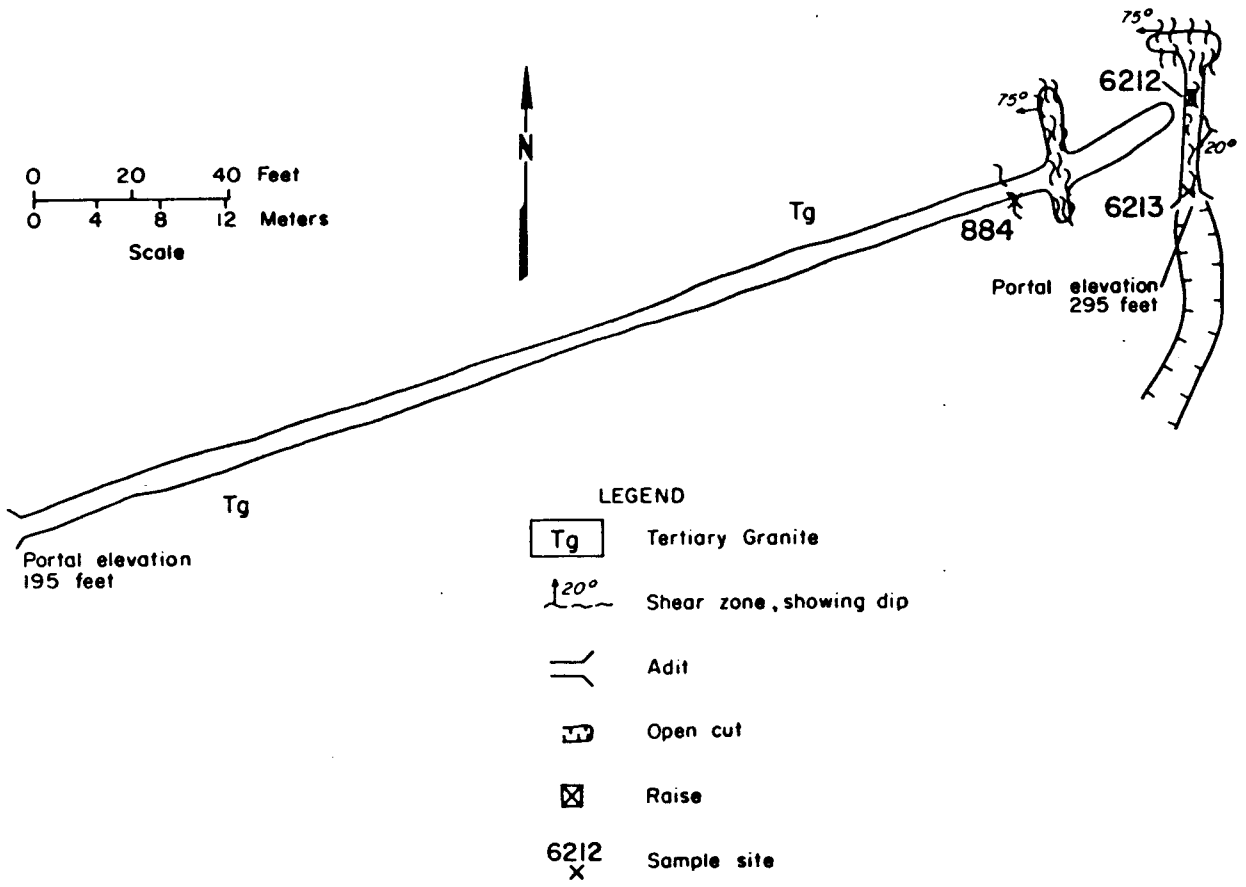


FIGURE 6. - Blackjack Prospect adit sample locations.

Bureau personnel located, mapped, and sampled the prospect in 1944, 1979, 1980, and 1981. In 1944, the prospect was sampled by Webber and Rutledge (36). Four samples were taken in the 42-ft-long adit with the highest values of 1.51 pct zinc, 0.16 pct copper, and 0.5 oz silver/ton. The average values over a 12.6-ft width were 0.7 pct zinc and 0.1 pct copper. Five samples were taken in the 280-ft-long adit. A 1.2-ft-long chip sample contained 2.08 pct zinc, 0.17 pct copper, 0.05 pct lead, and 0.3 oz silver/ton. A discontinuous chip 2.7-ft-wide contained 0.98 pct zinc, 0.07 pct copper, 0.02 pct lead, and 0.13 oz silver/ton. The other samples contained from 0 to 0.2 pct zinc and 0 to 0.02 pct copper. The prospect was reexamined in 1979 and 1980 by Bureau personnel. One grab sample (6212) taken from the 42-ft-long adit contained 40 ppm zinc and 285 ppm copper. Three grab samples were taken from the 280-ft-long adit. A grab sample (884) taken from a 1- to 6-in.-wide quartz vein contained 9 pct zinc, 0.57 pct copper, 0.29 pct lead, and 14.5 ppm silver. Two selected grab samples (847, 4173) of granite float contained 3 and 2.9 pct zinc, 0.2 and 0.18 pct copper, 0.1 and 0.15 pct lead, and 10 and 12 ppm silver. Five selected grab samples (885, 887-88, 1881-82) were taken from the shear zone north of the workings in 1980 and 1981. The samples contained from 22 to 230 ppm zinc, 6 to 250 ppm copper, 10 to 125 ppm lead, and 0.3 to 4.2 ppm silver.

Glendenning Prospect

The Glendenning Prospect (S-116) contains the only patented mining claims in the area. It is located approximately 0.5 mi northeast of

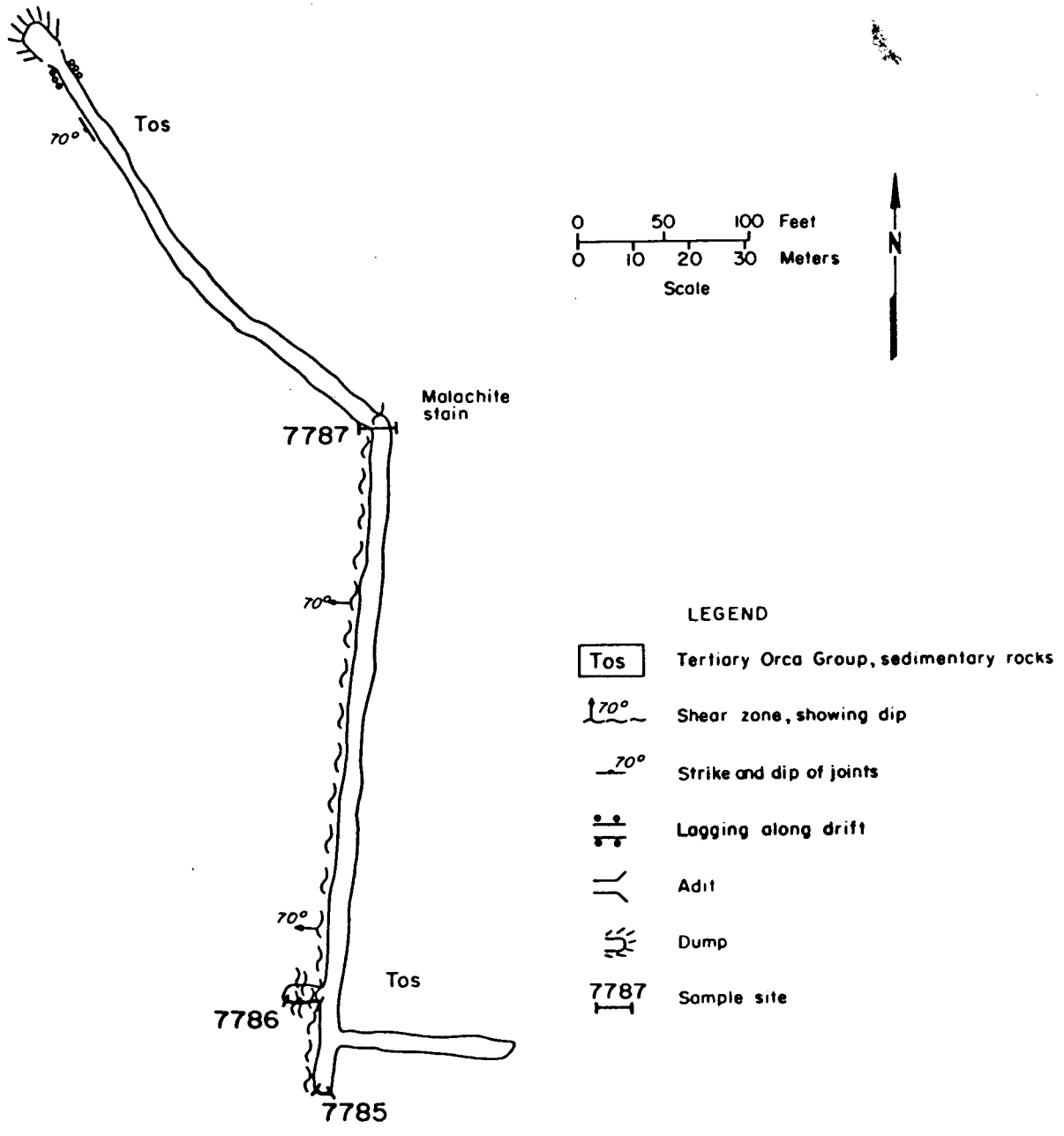


FIGURE 7. - Glendenning Prospect adit sample locations.

the Blackjack Prospect. One 700-ft-long adit (fig. 7) was driven along a 6- to 70-ft-wide shear zone, which strikes N5°E and dips 70°NW. The shear consists of silicified graywacke (?) in contact with the Cedar Bay pluton. The mineralization consists of 0.5- to 3-in.-wide veinlets of quartz, pyrite, and chalcopyrite.

Three chip samples (7785-87) were taken across the shear zone in the adit by the Bureau in 1982. The samples contained from 30 to 825 ppm copper.

GOLD-SILVER

One gold-silver bearing quartz vein with high sulfide content north of Wells Bay was labeled the Wells Bay No. 4 occurrence (A-11). The Wells Bay occurrence comprises a 30-ft-wide shear zone which strikes N20°E and dips 75° to 85° NW. The shear zone is traceable along strike for 100 ft. Mineralization includes pyrite, arsenopyrite, and quartz.

Eight selected grab samples (1019-21, 1075, 1079-81, 1097) were taken by the Bureau in 1980. The samples contained from <0.005 to 0.012 oz gold/ton, <0.2 to 0.6 oz silver/ton, and up to 0.2 pct arsenic.

PLACER GOLD

One placer gold occurrence has been identified in the report area; the Miners River Discovery (P-31). This occurrence was originally

staked in 1962, but no production was reported. Placer gold occurs within the Quaternary alluvium deposited in the river valley.

A 0.1 yd^3 placer sample (1854) taken by Bureau personnel in 1981, below the confluence with the Pedro Glacier drainage, contained 0.104 oz gold/yd^3. The gold fineness was 455. A 0.1 yd^3 placer sample (7775) taken above the confluence contained <0.03 ppm gold, 345 ppm copper, 215 ppm lead, and 300 ppm zinc, which are high values for a placer sample.

ZINC-LEAD

Two zinc-lead prospects and five occurrences occur in the study area. One prospect and the occurrences were located, mapped, and sampled by the Bureau; and included the Kadin Lake Prospect (A-2), the Long Bay No.1 (A-4), Wells Bay No.2 (A-6), Wells Bay No.3 (A-7), Miners River No.1 (A-9), and Miners River No.2 (A-10) occurrences. The Brown Bear Prospect (A-12) was not definitely located.

Kadin Lake Prospect

The Kadin Lake Prospect (A-2) consists of two mineralized and sheared felsic dikes. The 3- to 15-ft-wide felsic dikes strike from N50° to 60°E and dip 55°SE and 75°NW. Sphalerite, chalcopyrite, and galena occur in a 0.5-ft-wide zone in one dike. Arsenopyrite occurs as 1/8-in.-wide veinlets in the other dike. An 80-ft-long adit (fig. 8) and several prospect pits are located on the property.

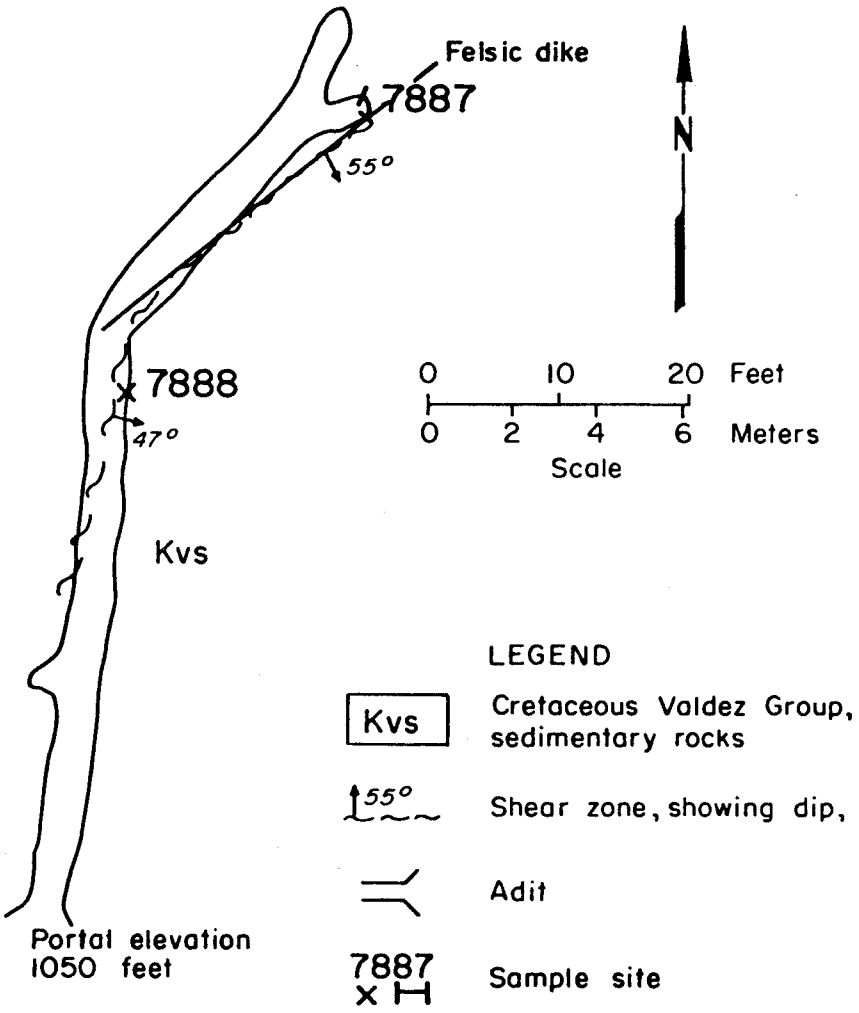


FIGURE 8. - Kadin Lake Prospect adit sample locations.

Five chip samples were taken by Bureau personnel in 1982. Two 3-ft-long chip samples (7887-88) taken in the adit contained 2.85 and 2.25 pct zinc, 0.59 and 0.16 pct copper, and 22 and 6.7 ppm silver. Three chip samples (7889-90, 7901) taken across the felsic dikes on the surface contained from 0.037 to 1.65 pct zinc, 0.020 to 0.7 pct copper, 4.4 to 12 ppm silver, 0.014 to 0.22 pct lead, and 0.012 to 1.65 pct arsenic. Inferred reserve base includes: adit - 285 tons at 2.38 pct zinc, 0.25 pct copper, and 9.92 ppm silver; surface - 50 tons at 1.65 pct zinc, 0.7 pct copper, and 12 ppm silver; felsic dike - 400 tons at 0.11 pct zinc, 0.4 pct copper, 0.22 pct lead, and 11.1 ppm silver.

Brown Bear Prospect

The Brown Bear Prospect (A-12) on the south side of Miners River consists of two veins which contain sphalerite, galena, pyrite, calcite, and quartz. The veins strike N40° to 50°E and dip 60° to 70°SE, and range in width from a few inches to 18 in. A 6-ft-long adit is reported on the property (33).

Two samples of the veins were taken by Pilgrim (34) in 1930 and contained 0.08 and 0.19 oz gold/ton, 3.6 and 28.8 oz silver/ton, 0.05 pct copper, 4.45 and 17.78 pct lead, and 12.29 and 28.88 pct zinc. One selected grab sample (933) taken in the area by Bureau personnel in 1980 of a 1- to 2-in.-wide veinlet contained 0.8 pct lead, 2.5 pct zinc, 8.5 ppm silver, and 1.5 ppm gold. The adit was not located at the time of examination. Inferred reserve base is 400 tons (33).

Long Bay No. 1 Occurrence

The Long Bay No.1 occurrence (A-4) consists of numerous 4-in. to 20-ft-wide shear zones, which cut metasedimentary rocks and greenstones. Although most of the shear zones strike from N25°W to N20°E and dip 80° to 90°S, some shear zones strike from N55° to 78°E and dip steeply. Mineralization consists of pods and veinlets of sphalerite, galena, pyrite, and arsenopyrite. Gossans occur over some of the shear zones in the metasedimentary rocks. Galena appears to be more concentrated in the metasedimentary rock, whereas sphalerite is more concentrated in the underlying (?) greenstones.

Twenty-two samples were taken by Bureau personnel in 1979, 1981, and 1982. Six chip samples (7957, 7972-74, 7978-79) contained from 0.0039 to 1.75 pct zinc, <0.0001 to 0.14 pct lead, 0.3 to 8.2 ppm silver, and 0.001 to 1.6 pct arsenic. Sixteen grab samples (1817-23, 1880, 7956, 7976-77, 7980-83, 7985) contained from 0.0036 to 3.2 pct zinc, 0.0005 to 2.6 pct lead, and <0.01 to 8 oz silver/ton.

Wells Bay No. 2 Occurrence

The Wells Bay No.2 occurrence (A-6) on the north side of a tributary to Wells Bay consists of a 10-ft-wide felsic dike and nine 1- to 20-ft-wide shear zones. The felsic dike strikes N10°W, dips 90°, and contains minor amounts of pyrite and arsenopyrite. The shear zones strike from north-south to N45°E and dip steeply. The zones have been traced for more than 250-ft along strike. Pyrite, arsenopyrite, galena, and chalcopyrite have been noted in the shears.

Five chip samples and three grab samples were taken from the shear zones and one chip sample was taken from the felsic dike by Bureau personnel in 1981 and 1982. Five chip samples (1887, 7788-91) taken from the shear zones contained from 0.0215 to 0.54 pct arsenic, <0.0001 to 1.1 pct lead, 0.0107 to 0.33 pct copper, and 0.9 to 10.6 ppm silver. Three grab samples (1889, 7792-93) contained from 0.092 to 5.1 pct arsenic, 0.031 to 0.5 pct copper, <0.03 to 1.42 ppm gold, and 2.5 to 9.0 ppm silver. The chip sample (1888) of the felsic dike contained 810 ppm arsenic and minor amounts of lead, copper, gold, and silver.

Wells Bay No. 3 Occurrence

The Wells Bay No.3 occurrence (A-7) is located at the headwaters of a tributary to Wells Bay. It consists of two 1- to 4-ft-wide shear zones. One shear zone strikes N26°W and dips 64°NE, and the other strikes N28°E. Mineralization includes sphalerite, galena, pyrite, and arsenopyrite. Gossans overlie the more mineralized portions of the shear zones.

Four diamond drill holes, two chip samples, and two grab samples were taken by Bureau personnel in 1982. Five samples (7951-55) from the four drill holes, 1- to 3-ft-long, contained from 0.0265 to 4.6 pct zinc, 0.0032 to 1.65 pct lead, 0.6 to 10.8 ppm silver, and 0.0011 to 0.18 pct arsenic. The two chip samples (7945, 7947) across the shear zones contained 0.43 pct and 93 ppm zinc, 0.37 pct and 125 ppm lead, 0.7 oz/ton and 1.9 ppm silver, and 0.12 pct and 360 ppm arsenic.

Two grab samples (7946, 7948) contained 1.5 and 3.7 pct zinc, 2 pct and 530 ppm lead, 2.5 oz/ton and 4.3 ppm silver, and 1.1 pct and 0.11 ppm arsenic.

Miners River No. 1 Occurrence

The Miners River No.1 occurrence (A-9) consists of a 450-ft-wide north-south trending brecciated shear zone. The shear zone is traceable along strike for approximately 0.5 mi. The zone consists of parallel brecciated zones containing quartz, calcite, and arsenopyrite. Float that contains galena, sphalerite, and arsenopyrite is present.

Three chip samples and one grab sample were taken by Bureau personnel in 1981. The three chip samples (1855-57) taken across the brecciated zones contained from 0.0026 to 0.18 pct arsenic, and minor amounts of zinc, lead, copper, silver, and gold. A selected grab sample (1859) of mineralized float contained 16 pct arsenic, 4.8 pct zinc, 1.7 pct lead, 0.5 pct copper, 2.2 oz silver/ton, and 0.06 oz gold/ton.

Miners River No. 2 Occurrence

The Miners River No. 2 occurrence (A-10) consists of felsic dikes and shear zones, which cut slates, graywackes, and conglomerates. The felsic dikes strike from N45°E to N85°W and dip from 60° to 80°N. The shear zones, ranging from a few inches to 150-ft-wide, primarily

strike from N25°E to N35°W and dip steeply. Some of the shears strike from N80°E to N80°W. Mineralization consists of 0.25- to 6-in.-wide veinlets of galena, sphalerite, and arsenopyrite. Pyrite occurs as disseminations and pods in the shear zones.

Three diamond drill holes, eleven chip samples, and six grab samples were taken by Bureau personnel in 1982. Fourteen samples (7958-71) taken from the three drill holes, ranging in depth from 2- to 5.75-ft, contained from 0.19 to 11.8 pct zinc, 0.0165 to 0.99 pct lead, 0.6 to 9.3 ppm silver, and <0.03 to 0.93 ppm gold. Ten chip samples (7770, 7772-73, 7781, 7784, 7800, 7812, 7929-31) taken across the shear zones contained from 0.0057 to 5.15 pct zinc, 0.0029 to 2.55 pct lead, and 0.3 to 37.5 ppm silver. Six grab samples (7771, 7774, 7796, 7798-99, 7811) contained from 0.0014 to 19 pct zinc, 0.0003 to 3.7 pct lead, 3.8 to 13.7 oz silver/ton, and 0.005 to 0.084 oz gold/ton. One chip sample (7797) taken across a felsic dike contained minor metal values. Inferred reserve base includes 1500 tons at 4.23 pct zinc, 2.24 pct lead, and 5.88 ppm silver.

NICKEL-COPPER

One nickel-copper prospect occurs in the report area. The Miners River Nickel Prospect (A-14) is located on the north shore of Miners Bay, Unakwik Inlet. It was located, mapped, and sampled by Bureau personnel in 1944, 1980, and 1982.

The prospect consists of a 10- to 25-ft-wide shear zone which cuts a Tertiary dioritic pluton. The zone strikes N20° to 40°E and dips 70° SE. Mineralization consists of disseminated pyrrhotite and chalco-

pyrite in the diorite and disseminated pyrrhotite, chalcopyrite, and pentlandite (?) in the fracture areas along the shear zone. The sulfides are more concentrated along the shear zone than in the diorite. Workings consist of an 8-ft-long adit and an 218-ft-long adit (fig. 9).

Both adits were mapped and sampled by Bureau personnel in 1944, 1980, and 1982. In 1944 Webber and Rutledge (37) took a 10-ft-long chip sample in the 8-ft-long adit. The sample contained 0.29 pct nickel. In the 218-ft-long adit a 20-ft-long chip sample contained 0.2 pct nickel and minor copper; and a 26-ft-long chip sample contained 0.2 pct nickel and minor copper. In 1980 and 1982, one chip, one grab, and one bulk sample were taken in the 8-ft-long adit. The 1-ft-long chip sample (865) taken across the shear zone contained 0.2 pct copper and 0.2 pct cobalt. The grab sample (866) contained 30 ppm nickel and 20 ppm copper. A 260 pound bulk sample (1494) from the adit consisted of ferromagnesian silicate minerals and calcic plagioclase feldspar, in about equal amounts with 10 to 15 pct pyrrhotite disseminated as medium-grained aggregates throughout the rock. The sample contained 0.25 pct nickel, 0.31 pct copper, and 0.02 pct cobalt. In the 218-ft-long adit a 20-ft-long chip sample (1090) contained 0.1 pct nickel, 0.1 pct copper, and 0.02 pct cobalt. A 30-ft-long chip sample (1214) contained 0.12 pct nickel, 0.11 pct copper, and 0.009 pct cobalt. Two grab samples (903, 934) contained 200 ppm nickel and 30 ppm and 0.1 pct copper. Twenty samples (860-62, 1091-96, 1203-13) taken from the diorite, east of the shear zone, contained from 0.008 to 0.2 pct nickel, 0.005 to 0.1 pct copper, and 0.004 to 0.02 pct cobalt. Two bulk samples (1403-04) contained 140 and 449 ppm nickel, 110 and 311 ppm copper, and 800 ppm cobalt.

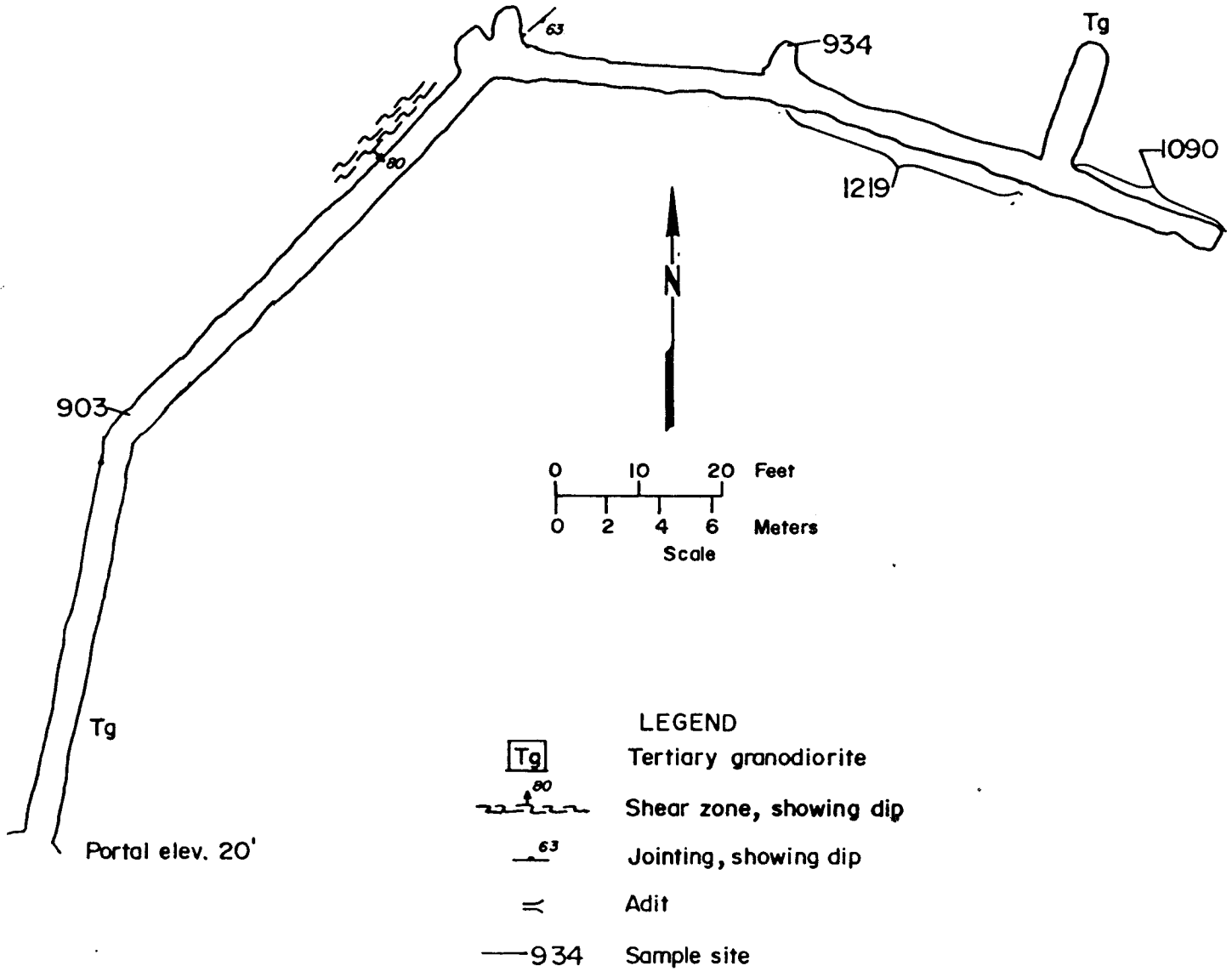


FIGURE 9. - Miners River Nickel Prospect adit sample locations.

Measured reserve base is: 4500 tons at 0.2 pct nickel (37); and indicated reserve base is 6500 tons at 0.2 pct nickel (37).

FLUORITE

One fluorite occurrence was discovered on the south side of a tributary to Wells Bay. The Wells Bay No.1 occurrence (A-5) was examined by Bureau personnel in 1981.

At the Wells Bay No.1 occurrence, fluorite occurs in a fluorite-quartz-calcite vein which strikes N10° to 25°W and dips 80°SW. The vein is from 3- to 12-ft-wide and is traceable for at least 100 ft along strike.

One 3-ft-long chip sample (1885) taken across the vein contained 17.5 pct fluorine. Inferred reserve base contains 1500 tons at 17.5 pct fluorine.

CONCLUSIONS

Eight previously reported prospects, eight previously unreported mineral occurrences, and one placer occurrence were located, mapped, and sampled in the western portion of the SOUND study area. Four previously reported prospects were looked for but not located.

North-northwest to north-northeast trending shear zones and veins that contain high copper, lead, zinc, fluorite, arsenic, nickel, cobalt, gold, and silver values are present along Long, Cedar, and Miners Bays, and along tributaries to Long Bay, Columbia Glacier, Miners River, Unakwik Inlet, and Wells Bay. Some felsic dikes contain arsenic, gold, silver, copper, and lead values.

Although brief examinations of the shear zones and veins revealed no large tonnages of mineralized material, the discovery of mineralization is significant because: 1) many of these mineralized zones had not previously been known in the area; 2) some of the samples found in the area contain the highest concentrations of fluorite and arsenic mineralization ever reported in the Orca Group; 3) close spatial and possible genetic relationship between sulfide mineralization and the felsic intrusives in the area has been further documented; 4) more detailed sampling of the mineralized areas may reveal continuations of existing shear zones and larger quantities of sulfide mineralization; and 5) further reconnaissance sampling may locate additional mineralized areas.

REFERENCES

1. Wahrhaftig, C. Physiographic Divisions of Alaska. U.S. Geol. Surv. Prof. Paper 482, 1965, [1966], 52 pp.

2. Schrader, F. C. A Reconnaissance of a Part of Prince William Sound and the Copper River District, Alaska, in 1898. 20th Ann. Rep., U.S. Geol. Surv., 1898-1899, Part VII, pp. 341-423.

3. Brooks, A. H. Geologic Features of Alaskan Metalliferous Lodes. U.S. Geol. Surv. Bull. 480-C, 1911, pp. 43-93, maps.

4. Capps, S. R., and B. L. Johnson. The Ellamar District, Alaska. U.S. Geol. Surv. Bull. 605, 1915, 125 pp.

5. Grant, U. S. Copper and Other Mineral Resources of Prince William Sound, Alaska. U.S. Geol. Surv. Bull. 284, 1906, pp. 78-87.

6. -----. Mining and Prospecting on Prince William Sound in 1909. U.S. Geol. Surv. Bull. 442-D, 1910, pp. 164-165.

7. Grant, U. S., and D. F. Higgins, Jr. Copper Mining and Prospecting on Prince William Sound. U.S. Geol. Surv. Bull. 379-C, 1909, pp. 87-86.

8. -----. Reconnaissance of the Geology and Mineral Resources of Prince William Sound, Alaska. U.S. Geol. Surv. Bull. 443, 1910, 89 pp.

9. Johnson, B. L. Mining on Prince William Sound. U.S. Geol. Surv. Bull. 592-G, 1914, pp. 237-243.

10. -----. Mining on Prince William Sound. U.S. Geol. Surv. Bull. 622-E, 1915, pp. 131-139.

11. -----. Mining on Prince William Sound. U.S. Geol. Surv. Bull. 642-D, 1916, pp. 137-145.

12. -----. Mining on Prince William Sound. U.S. Geol. Surv. Bull. 662-C, 1918, pp. 183-192.

13. -----. Mining on Prince William Sound. U.S. Geol. Surv. Bull. 692-C, 1919, pp. 143-151.

14. Moffitt, F. H. Geology of the Prince William Sound Region, Alaska. U.S. Geol. Surv. Bull. 989-E, 1954, pp. 225-310.

15. Moffitt, F. H., and R. E. Fellows. Copper Deposits of the Prince William Sound District, Alaska. U.S. Geol. Surv. Bull. 963-B, 1950, pp. 47-80.

16. Plafker, G., and F. S. MacNeil. Stratigraphic Significance of Tertiary Fossils from the Orca Group in the Prince William Sound Region, Alaska. U.S. Geol. Surv. Prof. Paper 550-B, 1966, pp. 62-68.

17. Plafker, G. Tectonics of the March 27, 1964, Alaska Earthquake. U.S. Geol. Surv. Prof. Paper 543-I, 1969, [1970], 74 pp.

18. -----. Alaskan Earthquake of 1964 and Chilean Earthquake of 1960; Implications for Arc Tectonics. J. Geophys. Res., v. 77, 1972, pp. 901-925.

19. Case, J. E., D. F. Barnes, G. Plafker, and S. L. Robbins. Gravity Surv. and Regional Geology of the Prince William Sound Epicentral Region, Alaska. U.S. Geol. Surv. Prof. Paper 543-C, 1966, pp. 1-12.

20. Case, J. E., R. Sikora, R. G. Tysdal, D. F. Barnes, and R. Morin. Geologic Interpretation of Simple Bouger Anomaly Map of the Seward and Blying Sound Quadrangles, Alaska. U.S. Geol. Surv. Misc. Field Studies Map MF-880-C, 1978.

21. Case, J. E., R. G. Tysdal, J. W. Hillhouse, and C. S. Gromme. Geologic Interpretation of Aeromagnetic Map of the Seward and Blying Sound Quadrangles, Alaska. U.S. Geol. Surv. Misc. Field Studies Map MF-880-D, 1978.

22. Cobb, E. H. Metallic Mineral Resources Map of the Anchorage Quadrangle, Alaska. U.S. Geol. Surv. Misc. Field Studies Map MF-409, 1972.

23. Cobb, E. H., and D. H. Richter. Metallic Mineral Resources Map of the Seward Quadrangle, Alaska. U.S. Geol. Surv. Misc. Field Studies Map MF-466, 1972.

24. Condon, W. H., and J. T. Cass. Map of a Part of the Prince William Sound Area, Alaska. Showing Linear Geologic Features as Shown on Aerial Photographs. U.S. Geol. Surv. Misc. Geol. Inv. Map I-273, 1958.

25. LeCompte, J. R. Interpretation of Landsat Imagery of the Seward and Blying Sound Quadrangles, Alaska. U.S. Geol. Surv. OFR 78-737, 1979.

26. Tysdal, R. G. Mines, Prospects, and Occurrences. Map of the Seward and Blying Sound Quadrangles, Alaska. U.S. Geol. Surv. Misc. Field Studies Map MF-880-A, 1978, [1979].

27. Tysdal, R. G., and J. E. Case. Geologic Map of the Seward and Blying Sound Quadrangles, Alaska. U.S. Geol. Surv., Misc. Inv. Map I-1150, 1979.

28. Helwig, J., and P. Emmet. Structure of the Early Tertiary Orca Group in Prince William Sound and Some Implications for the Plate Tectonic History of Southern Alaska. J. AK. Geol. Soc., v. 1, 1981, pp. 12-35.

29. Hudson, T., G. Plafker, and Z. E. Peterman. Paleogene Anatexis along the Gulf of Alaska Margin. Geol. v. 7, n. 12, 1979, pp. 573-577.

30. Plafker, G., and M. A. Lanphere. Radiometrically Dated Plutons Cutting the Orca Group, in U.S. Geol. Surv. AK. Program, 1974, ed. by Claire Carter. U.S. Geol. Surv. Cir. 700, 1974, pp. 53.

31. Plafker, G., D. L. Jones, and E. A. Pessagno. A Cretaceous Accretionary Flysch and Melange Terrane along the Gulf of Alaska Margin, in U.S. Geol. Surv. in AK.: Accomplishment during 1976, ed. by K. Bleon. U.S. Geol. Surv. Cir. 751-B, 1977, pp. 41-43.

32. Winkler, G. R., and G. Plafker. Geologic Map and Cross Sections of the Cordova and Middleton Island Quadrangles, Southern Alaska. U.S. Geol. Surv. OFR 81-1164, 1981.

33. Dahners, L. A. Preliminary Report on the Brown Bear Lead and Zinc Claims. Terr. of AK. Dept. of Mines PE 85-14, 1947, 6 pp.

34. Pilgrim, E. R. Prince William Sound and Valdez Districts, A. D. Thompson's Lead-Zinc Property. Terr. of AK. Dept. of Mines MR 193-2, 1930-31, pp. 19-21.

35. Williams, J. A. Four-in-One Copper Prospect, Anchorage Quadrangle. Terr. of AK. Dept. of Mines PE 85-19, 1954, 4 pp.

36. Webber, B. S., and F. A. Rutledge. Blackjack Claims. BuMines War Miner. Memorandum, 1944, unpublished. (Available at BuMines, Anchorage, AK.).

37. -----. Miners River Deposit. BuMines War Miner. Memorandum, 1944, unpublished. (Available at BuMines, Anchorage, AK.).

38. Jansons, U. 1979 Bureau of Mines Sampling Sites and Analytical Results for Samples Collected in the Chugach National Forest, Alaska. BuMines OFR 83-81, 1981, 229 pp.

39. Fechner, S. A., and M. P. Meyer. Placer Sampling and Related Bureau of Mines Activites in the SOUND Study Area of the Chugach National Forest, Alaska. BuMines OFR 62-82, 1982, 24 pp.

40. Jansons, U., R. B. Hoekzema, J. M. Kurtak, and S. A. Fechner. Mineral Occurrences in the Chugach National Forest, Southcentral Alaska. BuMines OFR 5-84, 1984, 218 pp., 4 figs.

41. Hoekzema, R. B. Strategic and Critical Mineral Development Potential of the Chugach National Forest, Southcentral Alaska. BuMines OFR 215-84, 1984, 64 pp.

42. Nelson, S. W., M. L. Miller, D. F. Barnes, J. A. Dumoulin, R. J. Goldfarb, R. A. Koski, C. G. Mull, W. J. Pickthorn, U. Jansons, R. B. Hoekzema, J. M. Kurtak, and S. A. Fechner. Mineral Resource Potential Map of the Chugach National Forest, Southcentral Alaska. U.S. Geol. Surv. MF-1645A, 1984, 24 pp., 1 map sheet.

43. State of Alaska. Minfile (Automated System for Alaska Mining Claim Information). Taken from Kardex Filing System. Div. of Geol. and Geophysical Surveys, College, Alaska.

BIBLIOGRAPHY

Berg, H. C., and E. H. Cobb. Metalliferous Lode Deposits of Alaska. U.S. Geol. Surv. Bull. 1246, 1967, pp. 63-73.

Brooks, A. H., and Others. Report on Progress of Investigations of Mineral Resources of Alaska in 1905, in Copper and other Mineral Resources of Prince William Sound, by U.S. Grant. U.S. Geol. Surv. Bull. 442-D, 1910, pp. 164-165.

Cobb, E. H. Summary of References to Mineral Occurrences (other than Mineral Fuels and Construction Materials) in the Anchorage, Quadrangle, Alaska. U.S. Geol. Surv. OFR 79-1095, 1979, 183 pp.

-----. Occurrences of Copper Minerals in Alaska. U.S. Geol. Surv. OFR 82-1029, 1982, 33 pp.

Cobb, E. H, and R. Kachadoorian. Index of Metallic and Nonmetallic Mineral Deposits of Alaska Compiled from Published Reports of Federal and State Agencies through 1959. U.S. Geol. Surv. Bull. 1139, 1961, 363 pp.

Fielder, H. Cedar Bay Zinc Property. Terr. of AK. Dept. of Mines PE 95-16, 1945.

Heiner, L. E., E. N. Wolf, and D. Grybeck. Copper Mineral Occurrences in the Wrangle Mt. - Prince William Sound area, Alaska. MIRL No. 27, 1971, 179 pp.

Jansons, U. 1980, 1981, and 1982 Bureau of Mines Sampling Sites and Analytical Results for Samples Collected in the Chugach National Forest, Alaska. U.S. BuMines, unpublished. (Available at BuMines, Anchorage, AK.)

MacKevett, E. M, Jr., and C. D. Holloway. Map Showing Metalliferous and Selected Nonmetalliferous Mineral Deposits in the Eastern Portion of Southern Alaska. U.S. Geol. Surv. OFR 77-169-A, 1977.

Nelson, S. W., and U. Jansons. Study Areas within the Chugach National Forest, Alaska. U.S. Geol. Prof. Paper 1300, 1983, pp. 29-31.

U.S. Bureau of Mines. Alaska 1:250,000 Scale Quadrangle Map Overlays Showing Mineral Deposit Locations, Principal Minerals, and Number and Type of Claims. BuMines OFR 20-73, 1980.

APPENDIX.-- SAMPLE RESULTS OF THE WESTERN PORTION OF THE SOUND STUDY AREA, CHUGACH NATIONAL FOREST, ALASKA.

Explanation

Sample Number/Year : Refers to field sample numbers and year sample was taken. Sample locations are shown on figure 4.

Material Type : Refers to type of material collected at the sampling site. The following material types were collected.

- Stream Sed - Stream sediment
- SL/SS/CG - Slate, sandstone, conglomerate
- Maf Volc - Mafic volcanic rock
- Maf Plut - Mafic plutonic rock
- Fel Plut - Felsic plutonic rock
- Fel Plut Q - Felsic plutonic rock with quartz veins
- Sed Rk/Q - Sedimentary rock with quartz veins
- Placer - Concentrates from 0.1 yd^3 of gravel run through a sluice box
- Calc - Calcite vein
- Sed/Volc - Sedimentary and volcanic rocks in area

Rock Type : Refers to rock types in the area of sampling as shown on 1:250,000 scale geologic maps. The rock types mapped as being present are:

- Qal - Unconsolidated deposits
- Meta Sed - Metasedimentary rocks, including all non-igneous rocks
- Maf Volc - Mafic volcanic rocks
- Fel Int - Felsic intrusive rocks

Rock Age : Refers to the geologic age of the underlying rock groups as shown on 1:250,000 scale geologic maps.

Quad 4 mile/1 mile : Refers to the 1:250,000 and 1:63,360 scale USGS quadrangle maps covering the area.

Sec/T/R/Mer : Refers to section, township, range, and meridian in which sample was collected.

- Sew - Seward
- CR - Copper River

Location/Property : Refers to geographic location of sampling site and name of mine or claim.

KX/MAS/File : Refers to the Kardex number, Mineral Availability System (MAS) number, and Bureau file number.

Proj. No./Sub. : Refers to the project number and subdivision the sample was taken for.

Sample Type : Refers to the type of sample taken. The following sample types were taken.

Stream sediment - A sample of silt, sand, and/or clay taken along a stream bed.
Grab - A collection of mineral and rock fragments taken at random from an outcrop or float.
Chip - A sample of ore or rock chips taken in a regular series along a continuous line or at uniformly spaced intervals.
Diamond Drill Hole - A sample taken of rock and/or minerals with a portable diamond drill which obtains a core and cuttings used for analysis.
Placer - A sample taken of surficial material which is concentrated in a sluice box.

E. Sp. : Refers to semiquantitative emission spectrographic technique analysis. Given in parts per million (ppm) unless otherwise noted.

AA/Wet (Geochem) : Refers to quantitative atomic absorption spectrophotometric technique analysis. Given in parts per million (ppm).

Assay : Refers to fire assaying technique analysis. Given in ounces per ton.

Sample Number/Year	773 / 80	774 / 80	847 / 80
Material Type	Sed Rk/Q	SS/SL/CG	Fel Plut
Rock Type	Metased	Metased	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Seward / D-2	Seward / D-2
Sec/T/R/Mer	08 / 10N/ 11E / Sew	08 / 10N/ 11E / Sew	18 / 10N/ 12E / Sew
Location/Property	Unakwik Inlet/Anderson	Unakwik Inlet/Anderson	Cedar Bay/Blk Jack
KX/MAS/File	254 / 134 / S-118	254 / 134 / S-118	260 / 51 / S-115
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum	12 pct	10 pct	3 pct
Arsenic			
Barium			
Boron	20		
Calcium	1.0 pct	4 pct	0.02 pct
Chromium	50	20	
Cobalt			
Copper	50	10	2000
Fluorine			
Gallium	20		
Germanium			
Gold			
Iron	5 pct	3 pct	5 pct
Lanthanum			
Lead			1000
Manganese	800	1000	800
Magnesium	3 pct	4 pct	0.2 pct
Molybdenum			40
Nickel	20	20	
Phosphorous			
Scandium			
Silver			10
Silicon	>20 pct	>20 pct	>20 pct
Sodium	2 pct	2 pct	
Strontium			
Tin			
Titanium	6000	5000	400
Tungsten			
Vanadium	100	70	
Yttrium			
Zinc			30000
Zirconium	40	40	

Sample Number/Year	848 / 80	860 / 80	861 / 80
Material Type	SS/SL/CG	Maf Volc	Maf Volc
Rock Type	Metased	Maf Volc	Maf Volc
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	08 / 10N / 11E / Sew	03 / 11N / 11E / Sew	03 / 11N / 11E / Sew
Location/Property	Unakwik Inlet/Anderson	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	254 / 134 / S-118	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum	15 pct	10 pct	10 pct
Arsenic			
Barium	20		
Boron			
Calcium	2 pct	7 pct	10 pct
Chromium	50	20	200
Cobalt			
Copper	50		
Fluorine			
Gallium	20	20	
Germanium			
Gold			
Iron	7 pct	1 pct	4 pct
Lanthanum			
Lead			
Manganese	800	400	600
Magnesium	4 pct	2 pct	4 pct
Molybdenum			
Nickel	20		20
Phosphorous			
Scandium			
Silver			
Silicon	20 pct	>20 pct	>20 pct
Sodium	2 pct	3 pct	2 pct
Strontium			
Tin			
Titanium	6000	1000	6000
Tungsten			
Vanadium	100	30	200
Yttrium		50	
Zinc			
Zirconium	50		

Sample Number/Year	862 / 80	865 / 80	866 / 80
Material Type	Maf Volc	Maf Plut	Maf Plut
Rock Type	Maf Volc	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage A-2
Sec/T/R/Mer	03 / 11N / 11E / Sew	04 / 11N / 11E / Sew	04 / 11N / 11E / Sew
Location/Property	Miners Bay / Miners Ni	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / 113 / A-14	220 / 113/ A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Chip 1'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum							17.0 pct		
Arsenic									
Barium									
Boron									
Calcium							7.0 pct		
Chromium							200		
Cobalt					2000				
Copper		100			2000		20		
Fluorine									
Gallium									
Germanium									
Gold		0.11			0.19				
Iron							5.0 pct		
Lanthanum									
Lead									
Manganese							400		
Magnesium							>4.0 pct		
Molybdenum									
Nickel							30		
Phosphorous									
Scandium									
Silver		0.50			2.2				
Silicon							>20.0 pct		
Sodium							2.0 pct		
Strontium									
Tin									
Titanium							3000		
Tungsten									
Vanadium							200		
Yttrium									
Zinc		30			40				
Zirconium									

Sample Number/Year	884 / 80	885 / 80	886 / 80
Material Type	Fel Plut / Q	Fel Plut / Q	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Seward / D-2	Seward / D-2
Sec/T/R/Mer	18 / 10N / 12E / Sew	18 / 10N / 12E / Sew	18 / 10N / 12E / Sew
Location/Property	Cedar Bay/Blk Jack	Cedar Bay / Blk Jack	Cedar Bay / Blk Jack
KX/MAS/File	260 / 51 / S-115	260 / 51 / S-115	260 / 51 / S-115
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			8.0 pct
Arsenic			
Barium			
Boron			20.0
Calcium			2.0 pct
Chromium			
Cobalt	9.0	15	
Copper	5700	250	
Fluorine			
Gallium			
Germanium			
Gold	0.05	0.08	
Iron			1.0 pct
Lanthanum			
Lead	2900	125	
Manganese			600.0
Magnesium			2.0 pct
Molybdenum	22	6.0	
Nickel	6.0	6.0	20.0
Phosphorous			
Scandium			
Silver	14.5	4.2	
Silicon			>20.0 pct
Sodium			2.0 pct
Strontium			
Tin	5.0	<5.0	
Titanium			5000.0
Tungsten	1280	8.0	
Vanadium			
Yttrium			
Zinc	90000	230	
Zirconium			70.0

Sample Number/Year	887 / 80	888 / 80	903 / 80
Material Type	Fel Plut / Q	Quartz	Maf Plut
Rock Type	Fel Int	Fel Int	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Seward / D-2	Anchorage / A-2
Sec/T/R/Mer	18 / 10N / 12E / Sew	17 / 10N / 12E / Sew	03 / 11N / 11E / Sew
Location/Property	Cedar Bay / Blk Jack	Cedar Bay / Blk Jack	Miners Bay / Miners Ni
KX/MAS/File	260 / 51 / S-115	260 / 51 / S-115	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum							17.0 pct		
Arsenic									
Barium									
Boron							20		
Calcium							10.0 pct		
Chromium									
Cobalt		10			15				
Copper		48			20		30		
Fluorine									
Gallium							20		
Germanium									
Gold		0.04			<0.03				
Iron							3.0 pct		
Lanthanum									
Lead		15			10				
Manganese							400		
Magnesium							0.4 pct		
Molybdenum		<2.0			<2.0				
Nickel		4.0			9.0				
Phosphorous									
Scandium									
Silver		1.7			1.0				
Silicon							>20.0 pct		
Sodium							2.0 pct		
Strontium									
Tin		<5.0			<5.0		3000		
Titanium									
Tungsten		<1.0			1.0				
Vanadium									
Yttrium							50		
Zinc		22			35.0				
Zirconium							200		

Sample Number/Year	933 / 80	934 / 80	986 / 80
Material Type	SS/SL/CG	Maf Plut	SS/SL/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-2	Anchorage / A-1
Sec/T/R/Mer	32 / 12N / 12E Sew	03 / 11N / 10E / Sew	35 / 12N / 12E / Sew
Location/Property	Miners River/Br. Bear	Miners Bay / Miners Ni	Miners River / 4 in 1
KX/MAS/File	97 / 114 / A-12	220 / 113 / A-14	114 / 115 / A-8
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum				17.0 pct					
Arsenic									
Barium									
Boron				30					
Calcium				10.0 pct					
Chromium				50					
Cobalt		18.0							
Copper		530		1000				4000	
Fluorine									
Gallium									
Germanium									
Gold		1.5						0.04	<0.005
Iron				5.0 pct					
Lanthanum									
Lead		8000							
Manganese				400					
Magnesium				4.0 pct					
Molybdenum		4.0							
Nickel		30.0		200					
Phosphorous									
Scandium									
Silver		8.5						8.8	0.4
Silicon				>20.0 pct					
Sodium				0.4 pct					
Strontium									
Tin		<5.0							
Titanium				6000					
Tungsten									
Vanadium				70					
Yttrium									
Zinc		25000						200	
Zirconium									

Sample Number/Year	:	987 / 81		:			:	
Material Type	:	SL/SS/CG		:			:	
Rock Type	:	Metased		:			:	
Rock Age	*	Tertiary		*			*	
Quad 4 mile/1 mile	*	Anchorage / A-1		*			*	
Sec/T/R/Mer	*	35 / T2N / T2E / Sew		*			*	
Location/Property	:	Miners River / 4 in 1		:			:	
KX/MAS/File	:	T14 / T15 / A-8		:			:	
Proj. no./Sub.	:	T219/SOUND		:	T219/SOUND		:	T219/SOUND
Sample Type	:	Random Chip 3'		:			:	
	*			*			*	

Element		E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
: Aluminum	:				:			:		
: Arsenic	:				:			:		
* Barium	*				*			*		
: Boron	:				:			:		
: Calcium	:				:			:		
* Chromium	*				*			*		
* Cobalt	*				*			*		
: Copper	:	2000			:			:		
: Fluorine	:				:			:		
: Gallium	:				:			:		
* Germanium	*				*			*		
* Gold	*	0.06	<0.005		*			*		
: Iron	:				:			:		
: Lanthanum	:				:			:		
* Lead	*				*			*		
* Manganese	*				*			*		
: Magnesium	:				:			:		
: Molybdenum	:				:			:		
* Nickel	*				*			*		
* Phosphorous	*				*			*		
: Scandium	:				:			:		
: Silver	:	7.5	<0.2		:			:		
* Silicon	*				*			*		
* Sodium	*				*			*		
* Strontium	*				*			*		
* Tin	*				*			*		
* Titanium	*				*			*		
* Tungsten	*				*			*		
: Vanadium	:				:			:		
: Yttrium	:				:			:		
: Zinc	:	60			:			:		
* Zirconium	*				*			*		

Sample Number/Year	1019 / 80	1020 / 80	1021 / 80
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	18 / 11N / 12E / Sew	18 / 11N / 12E / Sew	18 / 11N / 12E / Sew
Location/Property	Wells Bay / Occ #4	Wells Bay / Occ #4	Wells Bay / Occ #4
KX/MAS/File	--- / --- / A-11	--- / --- / A-11	--- / --- / A-11
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum	8 pct	17 pct	15 pct
Arsenic		0.2 pct	
Barium	0.1 pct	0.1 pct	0.1 pct
Boron		20	20
Calcium	2 pct	0.2 pct	2 pct
Chromium	20	100	80
Cobalt			
Copper	40	80	40
Fluorine			
Gallium		20	20
Germanium			
Gold		0.05 tr	<0.03 <0.005
Iron	5 pct	3 pct	3 pct
Lanthanum			
Lead			
Manganese	800	600	0.1 pct
Magnesium	4 pct	1 pct	2 pct
Molybdenum			
Nickel	40	100	100
Phosphorous			
Scandium			
Silver		0.88 <0.2	0.52 0.2
Silicon	>20 pct	>20 pct	>20 pct
Sodium	3 pct	0.4 pct	2 pct
Strontium			
Tin			
Titanium	0.3 pct	0.5 pct	0.5 pct
Tungsten			
Vanadium	50	100	50
Yttrium			
Zinc			
Zirconium		50	50

Sample Number/Year	1039 / 80	1040 / 80	1041 / 80
Material Type	SL/SS/CG	Maf Volc	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	35 / 12N / 12E / Sew	35 / 12N / 12E / Sew	35 / 12N / 12E / Sew
Location/Property	Miners River/ 4 in 1	Miners River /4 in 1	Miners River / 4 in 1
KX/MAS/File	114 / 115 / A-8	114 / 115 / A-8	114 / 115 / A-8
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Random Chip 1'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum				8 pct					
Arsenic							500		
Barium				0.2 pct					
Boron									
Calcium				2.0 pct					
Chromium									
Cobalt		270							
Copper	9400			60			30000		
Fluorine									
Gallium									
Germanium									
Gold		<0.03	<0.005				0.09		
Iron				1.5 pct					
Lanthanum									
Lead	24								
Manganese				600					
Magnesium				2.0 pct					
Molybdenum	<2								
Nickel	1800			40					
Phosphorous									
Scandium									
Silver	2.7		<0.2				46		
Silicon				>20 pct					
Sodium				0.6 pct					
Strontium									
Tin	<5								
Titanium				1000					
Tungsten	<5								
Vanadium									
Yttrium									
Zinc	49						1000		
Zirconium				200					

Sample Number/Year	1075 / 80	1076 / 80	1079 / 80
Material Type	SL/SS/CG	SL/SS/CG	Sed Rk / Q
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Seward / D-2	Anchorage / A-2
Sec/T/R/Mer	18 / 11N / 12E / Sew	05 / 10N / 11E / Sew	18 / 11N / 12E / Sew
Location/Property	Wells Bay / Occ #4	Unakwik Inlet/Anderson	Wells Bay / Occ #4
KX/MAS/File	--- / --- / A-11	254 / 134 / S-118	--- / --- / A-11
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum				10 pct					
Arsenic									
Barium				700					
Boron				20					
Calcium				2.0 pct					
Chromium				100					
Cobalt								35	
Copper		30						70	
Fluorine									
Gallium									
Germanium									
Gold		<0.03	<0.005					0.05	tr
Iron				2 pct					
Lanthanum									
Lead								30	
Manganese				400					
Magnesium				2 pct					
Molybdenum								<2	
Nickel				20				20	
Phosphorous									
Scandium									
Silver		0.5	<0.2					4.6	0.2
Silicon				>20 pct					
Sodium				2 pct					
Strontium									
Tin								20	
Titanium				3000					
Tungsten								7	
Vanadium				50					
Yttrium									
Zinc		60						450	
Zirconium									

Sample Number/Year	T080 / 80	T081 / 80	T090 / 80
Material Type	SL/SS/CG	SL/SS/CG	Fel Plut
Rock Type	Metased	Metased	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	18 / 11N / 12E / Sew	18 / 11N / 12E / Sew	03 / 11N / 11E / Sew
Location/Property	Wells Bay / Occ #4	Wells Bay / Occ #4	Miners Bay / Miners Ni
KX/MAS/File	--- / --- / A-11	--- / --- / A-11	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Random Chip 20'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum							17 pct		
Arsenic									
Barium									
Boron									
Calcium							8 pct		
Chromium							200		
Cobalt		20			30		200		
Copper		60			80		1000		
Fluorine									
Gallium									
Germanium									
Gold		0.18	0.012		<0.03	tr			
Iron							6 pct		
Lanthanum									
Lead		43			270				
Manganese							1000		
Magnesium							>4 pct		
Molybdenum		<2			<2				
Nickel		16			16		1000		
Phosphorous									
Scandium									
Silver		7.1	0.6		1.8	<0.2			
Silicon							>20 pct		
Sodium							1 pct		
Strontium									
Tin		30			30				
Titanium							3000		
Tungsten		<5			9				
Vanadium							200		
Yttrium									
Zinc		160			160				
Zirconium									

Sample Number/Year	T091 / 80	T092 / 80	T093 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 / T1N / T1E / Sew	03 / T1N / T1E / Sew	03 / T1N / T1E / Sew
Location/Property	Miners Bay /Miners Ni	Miners Bay /Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / T13 / A-14	220 / T13 / A-14	220 / T13 / A-14
Proj. no./Sub.	T219/SOUND	T219/SOUND	T219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum	17 pct	17 pct	17 pct
Arsenic			
Barium			
Boron		20	20
Calcium	8 pct	8 pct	6 pct
Chromium	200	500	100
Cobalt	100	80	
Copper	700	200	50
Fluorine			
Gallium			20
Germanium			
Gold			
Iron	4 pct	5 pct	6 pct
Lanthanum			
Lead			
Manganese	800	1000	1000
Magnesium	>4 pct	>4 pct	>4 pct
Molybdenum			
Nickel	800	400	100
Phosphorous			
Scandium			
Silver			
Silicon	>20 pct	>20 pct	>20 pct
Sodium	0.5 pct	0.6 pct	2 pct
Strontium			
Tin			
Titanium	1000	2000	7000
Tungsten			
Vanadium	100	100	80
Yttrium			
Zinc			
Zirconium		50	80

Sample Number/Year	T094 / 80	T095 / 80	T096 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 / T1N / T1E / Sew	03 / T1N / T1E / Sew	03 / T1N / T1E / Sew
Location/Property	Miners Bay / Miners Ni	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / T13 / A-14	220 / T13 / A-14	220 / T13/ A-14
Proj. no./Sub.	T219/SOUND	T219/SOUND	T219/SOUND
Sample Type	Grab	Random Chip 20'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum	17 pct			20 pct					
Arsenic									
Barium									
Boron				20					
Calcium	10 pct			8 pct					
Chromium	300			500					
Cobalt				100				50	
Copper	500			100				900	
Fluorine									
Gallium									
Germanium									
Gold								<0.03	
Iron	2 pct			5 pct					
Lanthanum									
Lead								15	
Manganese	600			1000					
Magnesium	3 pct			>4 pct					
Molybdenum								5	
Nickel	300			400				750	
Phosphorous									
Scandium									
Silver								4.0	
Silicon	>20 pct			>20 pct					
Sodium	1 pct			1 pct					
Strontium									
Tin								<5	
Titanium	500			2000					
Tungsten								<5	
Vanadium	200			200					
Yttrium									
Zinc								45	
Zirconium									

Sample Number/Year	1097 / 80	1102 / 80	1103 / 80
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Seward / D-2	Seward / D-2
Sec/T/R/Mer	18 / 11N / 12E / Sew	05 / 10N / 11E / Sew	05 / 10N / 11E / Sew
Location/Property	Wells Bay / Occ #4	Unakwik Inlet /	Unakwik Inlet /
KX/MAS/File	--- / --- / A-11	254 / 134 / S-118	254 / 134 / S-118
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum	15 pct	10 pct	8 pct
Arsenic			
Barium	0.1 pct	700	700
Boron	30	20	50
Calcium	3 pct	1.5 pct	0.5 pct
Chromium	50	70	70
Cobalt			
Copper	30		50
Fluorine			
Gallium		20	
Germanium			
Gold			
Iron	2 pct	3 pct	5 pct
Lanthanum			
Lead			
Manganese	0.1 pct	600	600
Magnesium	2 pct	2 pct	2 pct
Molybdenum			
Nickel	50	20	30
Phosphorous			
Scandium			
Silver			
Silicon	>20 pct	>20 pct	>20 pct
Sodium	3 pct	3 pct	2 pct
Strontium			
Tin			
Titanium	0.4 pct	3000	3000
Tungsten			
Vanadium	30	50	100
Yttrium			
Zinc			
Zirconium	50	100	

Sample Number/Year	1203 / 80	1204 / 80	1205 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 / 11N / 11E / Sew	01 / 11N / 11E / Sew	03 / 11N / 11E / Sew
Location/Property	Miners Bay /Miners Ni	Miners Bay /Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / 113 / A-14	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum	17 pct			17 pct			15 pct		
Arsenic									
Barium									
Boron									
Calcium	10 pct			8 pct			10 pct		
Chromium	500			100			500		
Cobalt	200	50		100	36		300	100	
Copper	400	290		400	195		1000	890	
Fluorine									
Gallium	20			20			20		
Germanium									
Gold		0.10			0.03			0.05	
Iron	8 pct			7 pct			8 pct		
Lanthanum									
Lead		47			25			35	
Manganese	600			600			600		
Magnesium	>4 pct			>4 pct			>4 pct		
Molybdenum		6			3		20	<2	
Nickel	500	220		300	150		2000	1150	
Phosphorous									
Scandium									
Silver		1.4			1.5			1.6	
Silicon	>20 pct			>20 pct			>20 pct		
Sodium	1 pct			2 pct			1 pct		
Strontium									
Tin		5			<5			<5	
Titanium	2000			7000			2000		
Tungsten		<5			<5			<5	
Vanadium	500			200			400		
Yttrium									
Zinc		50			50			40	
Zirconium	50						50		

Sample Number/Year	1206 / 80	1207 / 80	1208 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 / 11N / 11E / Sew	03 / 11N / 11E / Sew	03 / 11N / 11E / Sew
Location/Property	Miners Bay / Miners Ni	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / 113 / A-14	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Random Chip

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum	17 pct			18 pct			17 pct		
Arsenic									
Barium									
Boron							20		
Calcium	10 pct			8 pct			8 pct		
Chromium	500			500			400		
Cobalt	200	78		200	95		50	45	
Copper	400	450		1000	580		200	135	
Fluorine									
Gallium	20			20			20		
Germanium									
Gold		0.18			<0.03			<0.03	
Iron	8 pct			8 pct			5 pct		
Lanthanum									
Lead	100	170			50			30	
Manganese	800			800			800		
Magnesium	>4 pct			>4 pct			>4 pct		
Molybdenum	20	5			3			<2	
Nickel	1000	600		2000	700		400	120	
Phosphorous									
Scandium									
Silver		1.2			3.0			4.7	
Silicon	>20 pct			>20 pct			>20 pct		
Sodium	1 pct			1 pct			2 pct		
Strontium									
Tin		<5			<5			<5	
Titanium	2000			2000			2000		
Tungsten		<5			<5			<5	
Vanadium	400			200			200		
Yttrium									
Zinc		50			50			50	
Zirconium	50			80					

Sample Number/Year	1209 / 80	1210 / 80	1211 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 T1N / T1E / Sew	03 / T1N / T1E / Sew	03 / T1N / T1E / Sew
Location/Property	Miners Bay / Miners Ni	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / 113/ A-14	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum	18 pct			17 pct			18 pct		
Arsenic									
Barium									
Boron	20			20					
Calcium	6 pct			8 pct			10 pct		
Chromium	80			300			400		
Cobalt		40		100	60		50	38	
Copper	300	250		400	410		300	340	
Fluorine									
Gallium	30			20			20		
Germanium									
Gold		0.03			<0.03			<0.03	
Iron	4 pct			6 pct			7 pct		
Lanthanum									
Lead		35			16			17	
Manganese	800			800			800		
Magnesium	3 pct			>4 pct			>4 pct		
Molybdenum		<2			<2			3	
Nickel	200	75		1000	630		400	250	
Phosphorous									
Scandium									
Silver		1.4			2.3			3.6	
Silicon	>20 pct			>20 pct			>20 pct		
Sodium	4 pct			2 pct			2 pct		
Strontium									
Tin		<5			<5			<5	
Titanium	7000			1000			2000		
Tungsten		<5			<5			<5	
Vanadium	30			200			200		
Yttrium									
Zinc		50			40			40	
Zirconium	50								

Sample Number/Year	1212 / 80	1213 / 80	1214 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-2	Anchorage / A-2	Anchorage / A-2
Sec/T/R/Mer	03 / 11N / 11E / Sew	03 / 11N / 11E / Sew	03 / 11N / 11E / Sew
Location/Property	Miners Bay / Miners Ni	Miners Bay / Miners Ni	Miners Bay / Miners Ni
KX/MAS/File	220 / 113 / A-14	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Random Chip 30'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum	17 pct			18 pct			18 pct		
Arsenic									
Barium									
Boron				20			20		
Calcium	8 pct			8 pct			10 pct		
Chromium	300			400			400		
Cobalt	100	65		200	65		200	93	
Copper	100	155		500	220		2000	1100	
Fluorine	20								
Gallium				20			20		
Germanium									
Gold		<0.03			<0.03			0.07	
Iron	7 pct			8 pct			6 pct		
Lanthanum									
Lead		60			37			15	
Manganese	800			1000			800		
Magnesium	>4 pct			>4 pct			>4 pct		
Molybdenum		5			<2			<2	
Nickel	400	135		1000	450		2000	1150	
Phosphorous									
Scandium									
Silver		2.9			1.2			2.5	
Silicon	>20 pct			>20 pct			>20 pct		
Sodium	2 pct			1 pct			2 pct		
Strontium									
Tin		5			<5			<5	
Titanium	800			3000			2000		
Tungsten		<5			<5			<5	
Vanadium	100			200			200		
Yttrium									
Zinc		50			50			45	
Zirconium									

Sample Number/Year	1403 / 80	1404 / 80	1494 / 80
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-2	Anchorage/ A-2	Anchorage / A-2
Sec/T/R/Mer	03 /11 N/ 11E /Sew	03 / 11N/ 11E /Sew	03 / 11N/ 11E /Sew
Location/Property	Miners Bay/ Miner Ni	Miners Bay/Miners Ni	Miners Bay/Miners Ni
KX/MAS/File	220 / 113 / A-14	220 / 113 / A-14	220 / 113 / A-14
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum		9.6 pct	
Arsenic			
Barium		140	
Boron			
Calcium		7.57 pct	
Chromium		297	
Cobalt	800		0.02 pct
Copper	110	311	0.31 pct
Fluorine			
Gallium			
Germanium			
Gold			0.002
Iron		5.846 pct	
Lanthanum			
Lead			
Manganese		707	
Magnesium		6.85 pct	
Molybdenum			
Nickel	140	449	0.25 pct
Phosphorous		1520	
Scandium			
Silver			0.04
Silicon		23.99 pct	
Sodium			
Strontium		192	
Tin			
Titanium		2890	
Tungsten			
Vanadium			
Yttrium			
Zinc		204	
Zirconium			

Sample Number/Year	1816 / 81	1817 / 81	1818 / 81
Material Type	SL/SS/CG	SL/SS/CG	Slate
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	14 /10 N/12E /Sew	14 / 11N/ 12E /Sew	14 / 11 N/ 12E /Sew
Location/Property	Long Bay/Gilnow	Long Bay/Occ #1	Long Bay/Occ #1
KX/MAS/File	--- / --- /S-114	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		13			89			<10	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		21			17			15	
Copper		33			44			24	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			0.03	
Iron									
Lanthanum									
Lead		26			22			73	
Manganese									
Magnesium									
Molybdenum		3			<2			<2	
Nickel		30			24			22	
Phosphorous									
Scandium									
Silver		0.2			0.3	<0.01		0.2	<0.01
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			6	
Vanadium									
Yttrium									
Zinc		88			120			130	
Zirconium									

Sample Number/Year	1819 / 81	1820 / 81	1821 / 81
Material Type	SS/SL/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	14 /11 N/12E /Sew	14 / 11N/12E /Sew	14 /11 N/ 12E /Sew
Location/Property	Long Bay/Occ #1	Long Bay/Occ #1	Long Bay/Occ #1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		23			140			24	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		25			6			11	
Copper		74			320			325	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			0.04	0.009		0.03	0.034
Iron									
Lanthanum									
Lead		27			2.6 pct			0.27 pct	
Manganese									
Magnesium									
Molybdenum		<2			3			<2	
Nickel		39			5			14	
Phosphorous									
Scandium									
Silver		0.40	<0.01			8.0		7.3	0.26
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			53			9	
Vanadium									
Yttrium									
Zinc		115			0.2 pct			350	
Zirconium									

Sample Number/Year	1822 / 81	1823 / 81	1849 / 81
Material Type	Maf Volc	Gossan	Sed Rk/Q
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	14 / 11N/ 12E /Sew	14 /11 N/ 12E /Sew	35 / 12N/ 12E /Sew
Location/Property	Long Bay/Occ #1	Long Bay/Occ #1	Miners River/4 in 1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	114 / 115 / A-8
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Chip 15'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		50			77			150	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		99			57			10	
Copper		355			900			0.29 pct	
Fluorine									
Gallium									
Germanium									
Gold		0.31	0.035		0.03	<0.003		0.06	
Iron									
Lanthanum									
Lead		0.53 pct			2.45 pct			14	
Manganese									
Magnesium									
Molybdenum		<2			<2			<2	
Nickel		20			19			11	
Phosphorous									
Scandium									
Silver		7.3	0.01		34	0.78		28.6	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		3497			290			<5	
Vanadium									
Yttrium									
Zinc		1.7 pct			1.25 pct			120	
Zirconium									

Sample Number/Year	1850 / 81	1854 / 81	1855 / 81
Material Type	Sed Rk/Q	Placer	Sed Rk/Q
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-2	Anchorage / A-1
Sec/T/R/Mer	35 /12 N/ 12E /Sew	29 /12 N/12 E /Sew	33 / 12 N/12 E /Sew
Location/Property	Miners River/4 in 1	Miners R/ MR Disc.	Miners River/Occ #1
KX/MAS/File	114 / 115 / A-8	--- / --- / P-31	--- / --- / A-9
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Placer 0.1 cy	Chip

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		78			100			26	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		7			10			5	
Copper		195			50			19	
Fluorine									
Gallium									
Germanium									
Gold		<0.03				0.104		<0.03	
Iron									
Lanthanum									
Lead		9			115			94	
Manganese									
Magnesium									
Molybdenum		<2			<2			<2	
Nickel		9			50			8	
Phosphorous									
Scandium									
Silver		2.8				0.05		1.6	
Silicon									
Sodium									
Strontium									
Tin		<5			8			<5	
Titanium									
Tungsten		<5			2			21	
Vanadium									
Yttrium									
Zinc		40			125			700	
Zirconium									

Sample Number/Year	1856 / 81	1857 / 81	1858 / 81
Material Type	Sed Rk/Q	Sed Rk/Q	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Seward / D-1
Sec/T/R/Mer	33 /12 N/ 12E /Sew	33 /12 N/ 12E /Sew	33 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ #1	Miners River/Occ #1	Long Bay/ Occ.
KX/MAS/File	--- / --- / A-9	--- / --- / A-9	--- / --- / S-117
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 5'	Chip 3'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		0.18 pct			100			110	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		4			6			24	
Copper		36			270			0.6 pct	
Fluorine									
Gallium									
Germanium									
Gold		0.17	0.006		0.04	<0.003		<0.03	
Iron									
Lanthanum									
Lead		310			935			62	
Manganese									
Magnesium									
Molybdenum		<2			<2			3	
Nickel		8			11			10	
Phosphorous									
Scandium									
Silver		1.6	<0.01		4.1	0.14		26	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		13			47			<5	
Vanadium									
Yttrium									
Zinc		390			175			105	
Zirconium									

Sample Number/Year	1859 / 81	1877 / 81	1878 / 81
Material Type	Sulfides	Sed Rk/Q	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	33/ 12N/ 12E /Sew	35 /12 N/ 12E /Sew	35 / 12 N/12 E /Sew
Location/Property	Miners River/ Occ #1	Miners River/4 in 1	Miners River/4 in 1
KX/MAS/File	--- / --- / A-9	114 / 115 / A-8	114 / 115 / A-8
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Ran Chip 15'	Ran Chip 8'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		16 pct			570			105	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		13			9			14	
Copper		0.5 pct			20			690	
Fluorine									
Gallium									
Germanium									
Gold		1.7	0.06		0.18			<0.03	
Iron									
Lanthanum									
Lead		1.7 pct			18			13	
Manganese									
Magnesium									
Molybdenum		3			<2			<2	
Nickel		10			11			16	
Phosphorous									
Scandium									
Silver		55	2.2		2.6			8.6	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		968			<5			<5	
Vanadium									
Yttrium									
Zinc		4.8 pct			72			73	
Zirconium									

Sample Number/Year	1880 / 81	1881 / 81	1882 / 81
Material Type	Sulfides	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Seward / D-2	Seward / D-2
Sec/T/R/Mer	14 /11 N/ 12E /Sew	07 /10 N/ 12E /Sew	07 / 10 N/12 E /Sew
Location/Property	Long Bay/Occ #1	Cedar Bay/ Blk Jak	Cedar Bay/ Blk Jak
KX/MAS/File	--- / --- / A-4	260 / 51 / S-115	260 / 51 / S-115
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		67			60			<10	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		18			16			3	
Copper		100			14			6	
Fluorine									
Gallium									
Germanium									
Gold		0.03	<0.003		<0.03			<0.03	
Iron									
Lanthanum									
Lead		68			28			25	
Manganese									
Magnesium									
Molybdenum		2			2			2	
Nickel		17			8			5	
Phosphorous									
Scandium									
Silver		1.5	<0.01		1.3			0.3	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		683			<5			<5	
Vanadium									
Yttrium									
Zinc		3.2 pct			130			47	
Zirconium									

Sample Number/Year	1885 / 81	1887 / 81	1888 / 81
Material Type	Cal-Fluor Vein	SL/SS/CG	Graywacke/Fel Plut
Rock Type	Metased	Metased	Metased/Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	28 /11 N/12 E /Sew	10 / 11N/ 12E /Sew	10 / 11 N/12 E /Sew
Location/Property	Wells Bay/Occ #1	Wells Bay/Occ #2	Wells Bay/Occ #2
KX/MAS/File	--- / --- / A-5	--- / --- / A-6	--- / --- / A-6
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 3'	Chip 20'	Chip 15'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum							15 pct		
Arsenic					0.54 pct			810	
Barium							2000		
Boron							20		
Calcium							1 pct		
Chromium							200		
Cobalt		3			5			4	
Copper		27			130		20	23	
Fluorine		17.5 pct							
Gallium							20		
Germanium									
Gold		0.18			0.12	0.005		0.05	
Iron							4 pct		
Lanthanum									
Lead		82			46			21	
Manganese							400		
Magnesium							2 pct		
Molybdenum		6			2			<2	
Nickel		8			9		100	6	
Phosphorous									
Scandium									
Silver		4.5			1.4	<0.01		<0.03	
Silicon							>20 pct		
Sodium							2 pct		
Strontium									
Tin		<5			<5			<5	
Titanium							2000		
Tungsten		<5			<5			<5	
Vanadium							200		
Yttrium							10		
Zinc		27			39			34	
Zirconium									

Sample Number/Year	1889 / 81	2234 / 79	2235 / 79
Material Type	SL/SS/CG	Stream Sed	Stream Sed
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	10 /11 N/ 12E /Sew	35 /11 N/ 12E /Sew	35 / 11 N/ 12E /Sew
Location/Property	Wells Bay/Occ #2	Long Bay/Occ #1	Long Bay/Occ #1
KX/MAS/File	--- / --- / A-6	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Stream Sediment	Stream Sediment

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Antimony				<100			<100		
Arsenic		1.05 pct		<500			<500		
Barium				0.1 pct			0.1 pct		
Beryllium				<2			<2		
Bismuth				<10			<10		
Boron				50			50		
Calcium				0.5 pct			0.3 pct		
Cadmium				<50			<50		
Chromium				100			100		
Cobalt		20		20			20		
Copper		0.5 pct		150			150		
Fluorine									
Gallium				20			20		
Germanium				<20			<20		
Gold		1.25	0.389						
Iron				5 pct			5 pct		
Lanthanum				20			20		
Lead		126		100			100		
Manganese				0.2 pct			0.15 pct		
Magnesium				2 pct			2 pct		
Molybdenum		<2		<2			<2		
Niobium				20			20		
Nickel		13		30			20		
Phosphorous									
Scandium				20			20		
Silver		7.4	0.44	<1			<1		
Silicon									
Sodium									
Strontium				200			200		
Tin		<5		<10			<10		
Titanium				0.5 pct			0.3 pct		
Tungsten		<5		<50			<50		
Vanadium				150			100		
Yttrium				10			10		
Zinc		570		500			300		
Zirconium				100			100		

Sample Number/Year	2249 / 79	4149 / 79	4150 / 79
Material Type	Stream Sed	Stream Sed	Stream Sed
Rock Type	Fel Int	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Seward / D-1	Seward / D-1
Sec/T/R/Mer	18 /10 N/12 E /Sew	23 /10 N/ 12E /Sew	23 / 10 N/12 E /Sew
Location/Property	Cedar Bay/Blk Jak	Long Bay/Gilnow	Long Bay/Gilnow
KX/MAS/File	260 / 51 / S-115	--- / --- / S-114	--- / --- / S-114
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Stream Sediment	Stream Sediment	Stream Sediment

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Antimony	<100						<100		
Arsenic	<500						<500		
Barium	700						1000		
Beryllium	2						<2		
Bismuth	<10						<10		
Boron	<10						20		
Calcium	0.5 pct						0.2 pct		
Cadmium	<50						<50		
Chromium	<10						150		
Cobalt	<5						<5		
Copper	15			25			10	5	
Fluorine									
Gallium	10						15		
Germanium	<20						<20		
Gold									
Iron	1.5 pct						2 pct		
Lanthanum	20						20		
Lead	30			25			10	10	
Manganese	700						500		
Magnesium	1 pct						0.5 pct		
Molybdenum	<2						<2		
Niobium	<20						<20		
Nickel	<5						10		
Phosphorous									
Scandium	<10						<10		
Silver	<1						<1		
Silicon									
Sodium									
Strontium	100						200		
Tin	<10						<10		
Titanium	2000						2000		
Tungsten	<50						<50		
Vanadium	10						100		
Yttrium	<10						<10		
Zinc	<200			150			<200	20	
Zirconium	150						70		

Sample Number/Year	4171 / 79	4172 / 79	4173 / 79
Material Type	SL/SS/CG	Stream Sed	Sulfides
Rock Type	Metased	Metased	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-1	Seward / D-1	Seward / D-2
Sec/T/R/Mer	23 /10 N/ 12E /Sew	23 /10 N/ 12E /Sew	18 / 10 N/ 12E /Sew
Location/Property	Long Bay/Gilnow	Long Bay/Gilnow	Cedar Bay/Blk Jak
KX/MAS/File	--- / --- / S-114	--- / --- / S-114	260 / 51 / S-115
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Stream Sediment	Grab

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Antimony		<100	<100
Arsenic		<500	<500
Barium		1000	30
Beryllium		<2	<2
Bismuth		<10	15
Boron		30	10
Calcium		0.5 pct	<0.02 pct
Cadmium		<50	100
Chromium		50	<10
Cobalt		<5	<5
Copper	45	5	1500 1800
Fluorine			
Gallium		10	<10
Germanium		<20	<20
Gold	<0.02		<0.02
Iron		5 pct	3 pct
Lanthanum		20	<20
Lead	5	<10	500 1550
Manganese		500	100
Magnesium		3 pct	0.07 pct
Molybdenum		<2	30
Niobium		20	<20
Nickel		<5	<5
Phosphorous			
Scandium		10	<10
Silver	<0.2	<1	20 12
Silicon			
Sodium			
Strontium		200	100
Tin		<10	<10
Titanium		7000	200
Tungsten		<50	<50
Vanadium		100	10
Yttrium		<10	<10
Zinc	10	<200	>10000 2.9 pct
Zirconium		50	20

Sample Number/Year	6211 / 79	6212 / 79	6213 / 79
Material Type	Fel Plut	Fel Plut	Fel Plut
Rock Type	Fel Int	Fel Int	Fel Int
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-2	Seward / D-2	Seward / D-2
Sec/T/R/Mer	18 /10 N/ 12E /Sew	18 / 10N/ 12E /Sew	18 / 10 N/ 12E /Sew
Location/Property	Cedar Bay/Blak Jak	Cedar Bay/Blk Jak	Cedar Bay/Blk Jak
KX/MAS/File	260 / 51 / S-115	260 / 51 / S-115	260 / 51 / S-115
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab
			(No Analysis)

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Antimony	<100			<100					
Arsenic	500			<500					
Barium	50			300					
Beryllium	<2			<2					
Bismuth	20			<20					
Boron	<10			20					
Calcium	<0.02 pct			0.15 pct					
Cadmium	<50			<50					
Chromium	<10			15					
Cobalt	<5			<5					
Copper	700			300	285				
Fluorine									
Gallium	<10			20					
Germanium	<20			<20					
Gold									
Iron	5 pct			3 pct					
Lanthanum	<20			20					
Lead	100			300					
Manganese	200			100					
Magnesium	0.2 pct			0.5 pct					
Molybdenum	20			<2					
Niobium	<20			<20					
Nickel	5			<5					
Phosphorous									
Scandium	<10			<10					
Silver	30			<1					
Silicon									
Sodium									
Strontium	<100			100					
Tin	<10			<10					
Titanium	500			3000					
Tungsten	<50			<50					
Vanadium	<10			50					
Yttrium	<10			10					
Zinc	200			<200	40				
Zirconium	<20			200					

Sample Number/Year	7770 / 82	7771 / 82	7772 / 82
Material Type	SL/SS/CG	Sulfides	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage/ A-1	Anchorage /A-1
Sec/T/R/Mer	04 /11 N/ 12E /Sew	04 /11 N/12E /Sew	04 / 11 N/ 12E /Sew
Location/Property	Miners River/ Occ #2	Miners River/ Occ #2	Miners River/ Occ #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 1'	Grab	Chip 1'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		175			5000			19	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		2			7			3	
Copper		150			310			255	
Fluorine									
Gallium									
Germanium									
Gold		0.13				0.084		<0.03	
Iron									
Lanthanum									
Lead		6250			15500			24500	
Manganese									
Magnesium									
Molybdenum		3			3			<2	
Nickel		9			16			4	
Phosphorous									
Scandium									
Silver		17.2				3.8		22.9	
Silicon									
Sodium									
Strontium									
Tin		5			6			9	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		18000			81000			35000	
Zirconium									

Sample Number/Year	7773 / 82	7774 / 82	7775 / 82
Material Type	SL/SS/CG	Sulfides	Placer
Rock Type	Metased	Metased	Qal
Rock Age	Tertiary	Tertiary	Cretaceous
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	04 /11 N/ 12E /Sew	04 /11 N/ 12E /Sew	29 /12 N/ 12E /Sew
Location/Property	Miners River/Occ #2	Miners River/Occ #2	Miners River/MR Disc
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / P-31
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Ran Chip 10'	Grab	0.1 Placer

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Arsenic	420	600	17
Barium			
Boron			
Calcium			
Chromium			
Cobalt	2	7	8
Copper	1400	165	345
Fluorine			
Gallium			
Germanium			
Gold	0.07	<0.005	<0.03
Iron			
Lanthanum			
Lead	9900	24500	215
Manganese			
Magnesium			
Molybdenum	3	2	<2
Nickel	/	2	30
Phosphorous			
Scandium			
Silver	14.4	13.7	2.0
Silicon			
Sodium			
Strontium			
Tin	5	5	<5
Titanium			
Tungsten	<5	<2	<5
Vanadium			
Yttrium			
Zinc	1450	190000	300
Zirconium			

Sample Number/Year	:	7781 / 82	:	/	:	/		
Material Type	:	SL/SS/CG	:		:			
Rock Type	:	Metased	:		:			
Rock Age	*	Tertiary	*		*			
Quad 4 mile/1 mile	*	Anchorage / A-1	*	/	*	/		
Sec/T/R/Mer	*	04 /11 N/ 12E /Sew	*	/ N/ /Sew	*	/ N/ /Sew		
Location/Property	:	Miners River/Occ #2	:		:			
KX/MAS/File	:	--- / --- / A-10	:	/ /	:	/ /		
Proj. no./Sub.	:	1219/SOUND	:	1219/SOUND	:	1219/SOUND		
Sample Type	:	Chip 1'	:		:			
	*		*		*			

Element		E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
: Aluminum	:			:			:			
: Arsenic	:		1700	:			:			
* Barium	*			*			*			
: Boron	:			:			:			
: Calcium	:			:			:			
* Chromium	*			*			*			
* Cobalt	*		3	*			*			
: Copper	:		29	:			:			
: Fluorine	:			:			:			
: Gallium	:			:			:			
* Germanium	*			*			*			
* Gold	*		<0.03	*			*			
: Iron	:			:			:			
: Lanthanum	:			:			:			
* Lead	*		29	*			*			
* Manganese	*			*			*			
: Magnesium	:			:			:			
: Molybdenum	:		3	:			:			
* Nickel	*		10	*			*			
* Phosphorous	*			*			*			
: Scandium	:			:			:			
: Silver	:		0.3	:			:			
* Silicon	*			*			*			
* Sodium	*			*			*			
* Strontium	*			*			*			
* Tin	*		<5	*			*			
* Titanium	*			*			*			
* Tungsten	*		<5	*			*			
: Vanadium	:			:			:			
: Yttrium	:			:			:			
: Zinc	:		57	:			:			
* Zirconium	*			*			*			

Sample Number/Year	7784 / 82	7785 / 82	7786 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Seward / D-2	Seward / D-1
Sec/T/R/Mer	04 /11 N/12 E /Sew	08 /10 N/ 12E /Sew	08 /10 N/ 12E /Sew
Location/Property	Miners River/ Occ #2	Cedar Bay/Glendenning	Cedar Bay/Glendenning
KX/MAS/File	--- / --- / A-10	251 / --- / S-116	257 / --- / S-116
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 10'	Chip 6'	Chip 15'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		180			<10			38	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		6			7			32	
Copper		280			30			185	
Fluorine									
Gallium									
Germanium									
Gold		0.07			<0.03			<0.03	
Iron									
Lanthanum									
Lead		25500			66			13	
Manganese									
Magnesium									
Molybdenum		2			<2			<2	
Nickel		11			21			29	
Phosphorous									
Scandium									
Silver		4.1			0.1			0.1	
Silicon									
Sodium									
Strontium									
Tin		5			<5			<5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		51500			110			335	
Zirconium									

Sample Number/Year	7787 / 82	7788 / 82	7789 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Seward / D-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	08 /10 N/ 12E /Sew	10 /11 N/ 12E /Sew	10 /11 N/ 12E /Sew
Location/Property	Cedar Bay/Glendenning	Wells Bay/Occ #2	Wells Bay/ Occ #2
KX/MAS/File	257 / --- / S-116	--- / --- / A-6	--- / --- / A-6
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 6'	Chip 2'	Chip 3'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		52			1800			4600	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		32			7			14	
Copper		825			455			3300	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			0.05			<0.03	
Iron									
Lanthanum									
Lead		11			900			11000	
Manganese									
Magnesium									
Molybdenum		4			<2			<2	
Nickel		21			3			<1	
Phosphorous									
Scandium									
Silver		1.0			4.6			10.6	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		95			240			1250	
Zirconium									

Sample Number/Year	7790 / 82	7791 / 82	7792 / 82
Material Type	Maf Volc	SL/SS/CG	Quartz
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	10 /11 N/ 12E /Sew	10 /11 N/ 12E /Sew	10 /11 N/12E /Sew
Location/Property	Wells Bay/Occ #2	Wells Bay/Occ #2	Wells Bay/Occ #2
KX/MAS/File	--- / --- / A-6	--- / --- / A-6	--- / --- /A-6
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 1'	Chip 2'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		215			2600			51000	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		5			10			9	
Copper		107			395			1900	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			0.07			1.42	
Iron									
Lanthanum									
Lead		7			<1			17	
Manganese									
Magnesium									
Molybdenum		<2			2			<2	
Nickel		5			13			3	
Phosphorous									
Scandium									
Silver		0.9			1.0			9.0	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		9			<5			<5	
Vanadium									
Yttrium									
Zinc		30			43			40	
Zirconium									

Sample Number/Year	7793 / 82	7794 / 82	7796 / 82
Material Type	Quartz	Quartz	Calc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Seward / D-2	Anchorage / A-1
Sec/T/R/Mer	10 /11 N/ 12E /Sew	08 /10 N/11E /Sew	05 / 11 N/ 12E /Sew
Location/Property	Wells Bay/Occ #2	Unakwik Inlet/Anderson	Miners River/ Occ #2
KX/MAS/File	--- / --- / A-6	254 / 134 / S-118	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		920			31			690	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		<1			4			2	
Copper		310			23			12	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			0.12	
Iron									
Lanthanum									
Lead		2			1			3	
Manganese									
Magnesium									
Molybdenum		8			2			<2	
Nickel		8			7			4	
Phosphorous									
Scandium									
Silver		2.5			<0.1			0.7	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		56			165			14	
Zirconium									

Sample Number/Year	7797 / 82	7798 / 82	7799 / 82
Material Type	Fel Plut	Quartz	Sed Rk/Q
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage /A-1
Sec/T/R/Mer	8 /11 N/12E /Sew	8 /11 N/12E /Sew	8 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ #2	Miners River/Occ #2	Miners River/ Occ #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 6'	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		27			8000			81	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		3			<1			10	
Copper		11			49			310	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			0.52			0.10	
Iron									
Lanthanum									
Lead		1			390			8800	
Manganese									
Magnesium									
Molybdenum		<2			<2			3	
Nickel		5			2			10	
Phosphorous									
Scandium									
Silver		<0.1			15.2			20	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		16			185			22000	
Zirconium									

Sample Number/Year	7800 / 82	7811 / 82	7812 / 82
Material Type	SL/SS/CG	Sulfides	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	8 /11 N/ 12E /Sew	8 /11 N/ 12E /Sew	8 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ #2	Miners River/ Occ #2	Miners River/Occ #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 2'	Grab	Chip 2'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		8000			78			43000	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		10			4			3	
Copper		120			355			76	
Fluorine									
Gallium									
Germanium									
Gold		0.66				<0.005		0.73	
Iron									
Lanthanum									
Lead		200			37000			1950	
Manganese									
Magnesium									
Molybdenum		<2			<2			<2	
Nickel		14			4			2	
Phosphorous									
Scandium									
Silver		2.7				5.4		3.5	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		2750			42000			12000	
Zirconium									

Sample Number/Year	7818 / 82	7819 / 82	7820 /82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	11 / 9 S/ 11W /CR	11 / 9 S/11W /CR	11 / 9 S/ 11W /CR
Location/Property	Kadin Lake/Col. Red M.	Kadin Lake/Col. Red M.	Kadin Lake/Col. Red M.
KX/MAS/File	90 / 165 / A-1	90 / 165 / A-1	90 / 165 / A-1
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 8'	Chip 8'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		26			23			19	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		8			8			5	
Copper		1200			700			1250	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			<0.03	
Iron									
Lanthanum									
Lead		1400			650			815	
Manganese									
Magnesium									
Molybdenum		<2			<2			<2	
Nickel		11			17			13	
Phosphorous									
Scandium									
Silver		11.3			13.7			15.4	
Silicon									
Sodium									
Strontium									
Tin		<5			8			20	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		4400			3100			1800	
Zirconium									

Sample Number/Year	7887 / 82	7888 /82	7889 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Cretaceous	Cretaceous	Cretaceous
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	10 / 9 S/ 11W /CR	10 / 9 S/ 11W /CR	10 / 9 S/ 11W /CR
Location/Property	Kadin Lake/Idle Claim	Kadin Lake/Idle Claim	Kadin Lake/Idle Claim
KX/MAS/File	--- / --- / A-2	--- / --- / A-2	--- / --- / A-2
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 3'	Chip 3'	Chip 3'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		110			72			120	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		36			21			23	
Copper		5900			1650			7000	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			<0.03	
Iron									
Lanthanum									
Lead		345			245			135	
Manganese									
Magnesium									
Molybdenum		3			<2			<2	
Nickel		10			15			3	
Phosphorous									
Scandium									
Silver		22			6.7			12.0	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			81	
Vanadium									
Yttrium									
Zinc		28500			22500			16500	
Zirconium									

Sample Number/Year	7890 / 82	7901 / 82	7902 / 82
Material Type	Fel Plut	Fel Plut	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Cretaceous	Cretaceous	Cretaceous
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	10 / 9 S/ 11W /CR	10 / 9 S/ 11W /CR	11 / 9 S/ 11W /CR
Location/Property	Kadin Lake/Idle Claim	Kadin Lake/Idle Claim	Kadin Lake/Col. Red M.
KX/MAS/File	--- / --- / A-2	--- / --- / A-2	90 / 165 / A-1
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 4'	Ran Chip 10'	Chip 1'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		16500			3200			105	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		8			<1			/	
Copper		4000			205			1100	
Fluorine									
Gallium									
Germanium									
Gold		0.86			0.13			0.05	
Iron									
Lanthanum									
Lead		2250			200			7200	
Manganese									
Magnesium									
Molybdenum		41			6			3	
Nickel		2			2			17	
Phosphorous									
Scandium									
Silver		11.1			4.4			12.6	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			9	
Titanium									
Tungsten		<5			18			<5	
Vanadium									
Yttrium									
Zinc		1150			370			1600	
Zirconium									

Sample Number/Year	7903 / 82	7929 / 82	7930 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Cretaceous	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	11 / 9 S/ 11W /CR	4 / 11N/ 12E /Sew	9 / 11 N/12 E /Sew
Location/Property	Kadin Lake/Col. Red M.	Miners River/Occ. #2	Miners River/Occ #2
KX/MAS/File	90 / 165 / A-1	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 1'	Ran Chip 2'	Chip 2'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		265							
Barium									
Boron									
Calcium									
Chromium									
Cobalt		70			3			4	
Copper		70000			360			165	
Fluorine									
Gallium									
Germanium									
Gold			<0.005			<0.005			0.10
Iron									
Lanthanum									
Lead		240			20500			20500	
Manganese									
Magnesium									
Molybdenum		3			3			2	
Nickel		25			7			11	
Phosphorous									
Scandium									
Silver			8.9			1.7			37.5
Silicon									
Sodium									
Strontium									
Tin		<5							
Titanium									
Tungsten		11							
Vanadium									
Yttrium									
Zinc		2550			160			3800	
Zirconium									

Sample Number/Year	7931 / 82	7945 / 82	7946 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	8 /11 N/ 12 E/Sew	3 /11 N/ 12E /Sew	3 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ. #2	Wells Bay/Occ. #3	Wells Bay/Occ. #3
KX/MAS/File	--- / --- / A-10	--- / --- / A-7	--- / --- / A-7
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 3'	Chip 4'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic					1250			11000	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		4			2			9	
Copper		1050			77			115	
Fluorine									
Gallium									
Germanium									
Gold		0.21				<0.005			<0.005
Iron									
Lanthanum									
Lead		1300			3750			20000	
Manganese									
Magnesium									
Molybdenum		3			<2			2	
Nickel		8			2			10	
Phosphorous									
Scandium									
Silver		6.4				0.7			2.5
Silicon									
Sodium									
Strontium									
Tin					6			70	
Titanium									
Tungsten					<5			<5	
Vanadium									
Yttrium									
Zinc		8900			4300			15000	
Zirconium									

Sample Number/Year	7947 / 82	7948 / 82	7951 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	3 /11 N/ 12E /Sew	3 /11 N/12E /Sew	3 /11 N/ 12E /Sew
Location/Property	Wells Bay/Occ #3	Wells Bay/Occ #3	Wells Bay/Occ. #3
KX/MAS/File	--- / --- / A-7	--- / --- / A-7	--- / --- / A-7
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 1'	Grab	Diamond Drill Hole 2'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		360			1100			11	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		<1			5			6	
Copper		16			260			59	
Fluorine									
Gallium									
Germanium									
Gold		0.06			0.09			<0.03	
Iron									
Lanthanum									
Lead		125			530			32	
Manganese									
Magnesium									
Molybdenum		<2			2			4	
Nickel		8			6			21	
Phosphorous									
Scandium									
Silver		1.9			4.3			0.6	
Silicon									
Sodium									
Strontium									
Tin		<5			44			<5	
Titanium									
Tungsten		<5			<5			5	
Vanadium									
Yttrium									
Zinc		93			37000			265	
Zirconium									

Sample Number/Year	7952 / 82	7953 / 82	7954 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	3 /11 N/12E /Sew	3 /11 N/12E /Sew	3 / 11 N/ 12E /Sew
Location/Property	Wells Bay/Occ. #3	Wells Bay/ Occ. #3	Wells Bay/ Occ. #3
KX/MAS/File	--- / --- / A-7	--- / --- /A-7	--- / --- / A-7
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole 1'	Diamond Drill Hole 1'	Diamond Drill Hole 1'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		44			690			360	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		4			<1			3	
Copper		27			76			36	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			0.05			0.08	
Iron									
Lanthanum									
Lead		74			215			4300	
Manganese									
Magnesium									
Molybdenum		3			2			4	
Nickel		16			8			8	
Phosphorous									
Scandium									
Silver		0.8			2.45			10.8	
Silicon									
Sodium									
Strontium									
Tin		<5			21			5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		6200			4000			3350	
Zirconium									

Sample Number/Year	7955 / 82	7956 / 82	7957 / 82
Material Type	SL/SS/CG	Maf Volc	Maf Volc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage/A-1	Anchorage / A-1
Sec/T/R/Mer	3 /11 N/ 12E /Sew	14 /11 N/12E /Sew	14 / 11 N/ 12E /Sew
Location/Property	Wells Bay/ Occ. #3	Long Bay/Occ #1	Long Bay/ Occ. #1
KX/MAS/File	--- / --- / A-7	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole 1'	Grab	Chip 2'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		1850			67			47	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		2			3			23	
Copper		78			18			175	
Fluorine									
Gallium									
Germanium									
Gold			<0.005		<0.03			<0.03	
Iron									
Lanthanum									
Lead		16500			76			10	
Manganese									
Magnesium									
Molybdenum		3			4			10	
Nickel		6			10			39	
Phosphorous									
Scandium									
Silver			4.6		0.6			0.4	
Silicon									
Sodium									
Strontium									
Tin		32			<5			<5	
Titanium									
Tungsten		<5			8			23	
Vanadium									
Yttrium									
Zinc		46000			92			635	
Zirconium									

Sample Number/Year	7958 / 82	7959 / 82	7960 / 82
Material Type	Sed Rk/Q	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	4 /11 N/ 12E /Sew	4 / 11N/ 12E /Sew	4 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ. #2	Miners River/Occ. #2	Miners River/ Occ. #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole 2'	Diamond Drill Hole	Diamond Drill Hole
		0.67'	0.75'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		400			190			<10	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		9			7			5	
Copper		20			13			28	
Fluorine									
Gallium									
Germanium									
Gold		0.06			0.06			<0.03	
Iron									
Lanthanum									
Lead		320			165			275	
Manganese									
Magnesium									
Molybdenum		4			5			3	
Nickel		17			14			22	
Phosphorous									
Scandium									
Silver		1.5			0.8			2.8	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			<5	
Vanadium									
Yttrium									
Zinc		15000			5200			9300	
Zirconium									

Sample Number/Year	7961 / 82	7962 / 82	7963 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	4 /11 N/12E /Sew	4 /11 N/ 12E /Sew	4 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ. #2	Miners River/ Occ. #2	Miners River/Occ. #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole	Diamond Drill Hole .9'	Diamond Drill Hole
	0.5'		0.75'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		<10			<10			23	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		6			6			9	
Copper		26			23			19	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			<0.03	
Iron									
Lanthanum									
Lead		285			390			400	
Manganese									
Magnesium									
Molybdenum		4			4			5	
Nickel		14			17			19	
Phosphorous									
Scandium									
Silver		0.8			0.8			0.6	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			11	
Vanadium									
Yttrium									
Zinc		3600			1900			1950	
Zirconium									

Sample Number/Year	7964 / 82	7965 / 82	7966 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	4 / 11N/ 12E /Sew	4 / 11N/ 12E /Sew	4 / 11 N/ 12E /Sew
Location/Property	Miners Bay/Occ. #2	Miners River/Occ.#2	Miners River/Occ. #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole	Diamond Drill Hole	Diamond Drill Hole
	0.58'	0.58'	0.58'

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Arsenic	<10	<10	34
Barium			
Boron			
Calcium			
Chromium			
Cobalt	9	7	6
Copper	28	27	16
Fluorine			
Gallium			
Germanium			
Gold	<0.03	<0.03	<0.03
Iron			
Lanthanum			
Lead	990	1000	435
Manganese			
Magnesium			
Molybdenum	3	4	3
Nickel	18	17	11
Phosphorous			
Scandium			
Silver	1.2	1.3	1.3
Silicon			
Sodium			
Strontium			
Tin	<5	<5	<5
Titanium			
Tungsten	<5	<5	<5
Vanadium			
Yttrium			
Zinc	3700	7500	8500
Zirconium			

Sample Number/Year	7967 / 82	7968 / 82	7969 / 82
Material Type	SL/SS/CG	SL/SS/CG	SL/SS/CG
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage /A-1	Anchorage / A-1
Sec/T/R/Mer	4 / 11N/ 12E /Sew	4 /11 N/ 12E /Sew	4 / 11 N/ 12E /Sew
Location/Property	Miners River/Occ. #2	Miners River/Occ. #2	Miners River/Occ. #2
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-10
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole	Diamond Drill Hole	Diamond Drill Hole 1'
	0.42'	0.75'	

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Arsenic	40	7000	11500
Barium			
Boron			
Calcium			
Chromium			
Cobalt	9	7	15
Copper	150	120	52
Fluorine			
Gallium			
Germanium			
Gold	0.03	0.27	0.93
Iron			
Lanthanum			
Lead	4000	4200	165
Manganese			
Magnesium			
Molybdenum	2	2	<2
Nickel	14	10	15
Phosphorous			
Scandium			
Silver	7.8	6.1	2.8
Silicon			
Sodium			
Strontium			
Tin	<5	<5	<5
Titanium			
Tungsten	<5	<5	<5
Vanadium			
Yttrium			
Zinc	68000	7300	96000
Zirconium			

Sample Number/Year	7970 / 82	7971 / 82	7972 / 82
Material Type	SL/SS/CG	SL/SS/CG	Maf Volc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	4 / 11N/ 12E /Sew	4 / 11N/ 12E /Sew	14 / 11 N/ 12E /Sew
Location/Property	Miners River/ Occ. #2	Miners River/Occ. #2	Long Bay/Occ. #1
KX/MAS/File	--- / --- / A-10	--- / --- / A-10	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Diamond Drill Hole	Diamond Drill Hole	Chip 6'
	0.5'	0.5'	

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Arsenic	2000	4400	57
Barium			
Boron			
Calcium			
Chromium			
Cobalt	12	77	13
Copper	23	180	60
Fluorine			
Gallium			
Germanium			
Gold	0.57	0.30	<0.03
Iron			
Lanthanum			
Lead	55	9900	650
Manganese			
Magnesium			
Molybdenum	<2	<2	6
Nickel	10	11	21
Phosphorous			
Scandium			
Silver	1.9	9.3	0.7
Silicon			
Sodium			
Strontium			
Tin	<5	<5	<5
Titanium			
Tungsten	<5	<5	<5
Vanadium			
Yttrium			
Zinc	118000	35000	1200
Zirconium			

Sample Number/Year	7973 / 82	7974 / 82	7976 / 82
Material Type	Maf Volc	Maf Volc	Maf Volc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage/ A-1
Sec/T/R/Mer	14 / 11N/ 12E /Sew	14 /11 N/ 12E /Sew	15 / 11 N/12 E /Sew
Location/Property	Long Bay/Occ. #1	Long Bay/Occ. #1	Long Bay/Occ. #1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 3'	Chip 3'	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		16			<10			51	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		21			29			6	
Copper		51			115			230	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			0.4	
Iron									
Lanthanum									
Lead		<1			51			1900	
Manganese									
Magnesium									
Molybdenum		<2			3			2	
Nickel		16			53			11	
Phosphorous									
Scandium									
Silver		0.3			0.6			9.5	
Silicon									
Sodium									
Strontium									
Tin		5			<5			<5	
Titanium									
Tungsten		<5			<5			12	
Vanadium									
Yttrium									
Zinc		9000			17500			1850	
Zirconium									

Sample Number/Year	7977 / 82	7978 / 82	7979 / 82
Material Type	Sulfides	Quartz	Maf Volc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage / A-1	Anchorage / A-1
Sec/T/R/Mer	15 /11 N/12E /Sew	15 /11 N/ 12E /Sew	14 / 11 N/ 12E /Sew
Location/Property	Long Bay/Occ. #1	Long Bay/Occ. #1	Long Bay/Occ. #1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Chip 1'	Chip 2'

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		680			71			16000	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		4			10			110	
Copper		14			47			190	
Fluorine									
Gallium									
Germanium									
Gold		0.29			0.09			0.03	
Iron									
Lanthanum									
Lead		25			4			1400	
Manganese									
Magnesium									
Molybdenum		<2			2			6	
Nickel		2			17			16	
Phosphorous									
Scandium									
Silver		3.7			8.2			2.2	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			8	
Titanium									
Tungsten		6			15			<5	
Vanadium									
Yttrium									
Zinc		36			39			2100	
Zirconium									

Sample Number/Year	7980 / 82	7981 / 82	7982 / 82
Material Type	Maf Volc	Maf Volc	Fel Plut
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	14/ 11N/ 12E /Sew	14 /11 N/ 12E /Sew	14 / 11 N/ 12E /Sew
Location/Property	Long Bay/Occ. #1	Long Bay/Occ. #1	Long Bay/Occ. #1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Grab	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		225			13			<10	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		138			18			4	
Copper		440			60			12	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			<0.03	
Iron									
Lanthanum									
Lead		10			5			19	
Manganese									
Magnesium									
Molybdenum		<2			4			<2	
Nickel		15			29			8	
Phosphorous									
Scandium									
Silver		0.5			0.1			0.3	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		14			<5			8	
Vanadium									
Yttrium									
Zinc		245			180			86	
Zirconium									

Sample Number/Year	7983 / 82	7984 / 82	7985 / 82
Material Type	Maf Volc	Stream Sed	Maf Volc
Rock Type	Metased	Metased	Metased
Rock Age	Tertiary	Tertiary	Tertiary
Quad 4 mile/1 mile	Anchorage/ A-1	Anchorage/ A-1	Anchorage / A-1
Sec/T/R/Mer	14 /11 N/ 12E /Sew	23 /11 N/12 E /Sew	23 / 11 N/ 12E /Sew
Location/Property	Long Bay/Occ. #1	Long Bay/Occ. #1	Long Bay/Occ. #1
KX/MAS/File	--- / --- / A-4	--- / --- / A-4	--- / --- / A-4
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Grab	Stream Sediment	Grab

Element	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay	E. Sp	AA/Wet	Assay
Aluminum									
Arsenic		<10			33			<10	
Barium									
Boron									
Calcium									
Chromium									
Cobalt		33			12			25	
Copper		165			37			165	
Fluorine									
Gallium									
Germanium									
Gold		<0.03			<0.03			<0.03	
Iron									
Lanthanum									
Lead		16			11			285	
Manganese									
Magnesium									
Molybdenum		14			2			14	
Nickel		32			27			22	
Phosphorous									
Scandium									
Silver		0.2			0.1			<0.1	
Silicon									
Sodium									
Strontium									
Tin		<5			<5			<5	
Titanium									
Tungsten		<5			<5			16	
Vanadium									
Yttrium									
Zinc		1650			185			355	
Zirconium									

Sample Number/Year	7997 / 82	7998 / 82	/
Material Type	SL/SS/CG	SL/SS/CG	
Rock Type	Metased	Metased	
Rock Age	Tertiary	Tertiary	
Quad 4 mile/1 mile	Anchorage / A-1	Anchorage / A-1	/
Sec/T/R/Mer	11 / 9 S/ 11W /CR	11 / 9 S/ 11 W/CR	/ N/ /Sew
Location/Property	Kadin Lake/Col. Red M.	Kadin Lake/Col. Red.M.	
KX/MAS/File	90 / 165 / A-1	90 / 165 / A-1	/ /
Proj. no./Sub.	1219/SOUND	1219/SOUND	1219/SOUND
Sample Type	Chip 4'	Chip 4'	

Element	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay	E. Sp AA/Wet Assay
Aluminum			
Arsenic	295	130	
Barium			
Boron			
Calcium			
Chromium			
Cobalt	29	12	
Copper	55000	1200	
Fluorine			
Gallium			
Germanium			
Gold	0.03	0.03	
Iron			
Lanthanum			
Lead	1800	4200	
Manganese			
Magnesium			
Molybdenum	3	2	
Nickel	28	4	
Phosphorous			
Scandium			
Silver	75.2	19.7	
Silicon			
Sodium			
Strontium			
Tin	<5	<5	
Titanium			
Tungsten	<5	<5	
Vanadium			
Yttrium			
Zinc	6700	8700	
Zirconium			