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Mineral Assessment of the Stikine Area, Central Southeast Alaska

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The Bureau of Land Management sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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Cover Photograph

Mining engineer Jan Still explores for rare-earth elements near Black Crag. Photo by M. McDonald.

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Mineral Assessment
of the
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Prepared for the United States Department of the Interior
Bureau of Land Management, Alaska

May 2002

By

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UNITS OF MEASURE AND OTHER ABBREVIATIONS/ACRONYMS

Measure:

°	degree(s)
oz/t	troy ounce(s) per short ton
ppm	part(s) per million
ppb	part(s) per billion
Mt	million(s) of short tons

To be consistent with the various analytical methods and degrees of accuracy expressed by the analytical laboratory, sample results listed in the text are identical in terms of units and significant figures as those reported by the laboratory and show in tables B-1 to B-3.

Land status:

OF	open Federal
CF	closed Federal
N	Native
P	private
S	State

Deposit type:

PR	polymetallic replacement
PV	polymetallic vein
Mag Seg	magmatic segregation
P	porphyry
Dissem	disseminated sulfide
VMS	volcanogenic massive sulfide
Peg	pegmatite

Other:

AMIS	Alaska Minerals Information System
MAS	Minerals Availability System
MDP	mineral development potential (See appendix A)
MEP	mineral exploration potential (See appendix A)
KMDA	known mineral deposit area
BLM	U.S. Department of the Interior, Bureau of Land Management
USDA	U.S. Department of Agriculture
USGS	U.S. Department of the Interior, Geological Survey
ADGGS	State of Alaska, Department of Natural Resources,Division of Geological and Geophysical Surveys

ABSTRACT

In 1997 the U.S. Department of the Interior, Bureau of Land Management (BLM) began a 4-year mineral resource assessment of the Stikine area in central Southeast Alaska. The 5.7-million-acre study area encompasses the mainland bordering Frederick Sound and Kupreanof, Kuiu, Zarembo, Wrangell, Etolin, and nearby islands. The study area covers the Kupreanof and Petersburg Mining Districts, the Wrangell Subdistrict, and additional lands not included in adjacent mining district studies. As the primary land manager in the area, the U.S. Department of Agriculture, Forest Service, requested that the BLM assess the mineral potential in the Stikine area for the purpose of generating information that will aid the agency in future judgements regarding land management. This report serves as the final, comprehensive presentation of information gathered during the Stikine area study from 1997 to 2000. Over 175 mineral occurrences, industrial mineral sites, and geophysical anomalies were examined during this study. Also, over 130 localities were sampled to follow up road systems, USGS geochemical anomalies, and unpublished, mineral exploration company data.

The Stikine area hosts a variety of mineral deposit types, including volcanogenic massive sulfide (VMS), polymetallic replacement, polymetallic vein, vein gold, skarn, porphyry molybdenum, magmatic segregation, and veins of barite. In addition, there are minor deposits of placer gold, uranium, and coal. The Castle Island Mine produced 787,000 tons of barite between 1966 and 1980 (Carnes, 1980) from a VMS deposit. Minor gold production came from vein gold deposits of the Maid of Mexico (Chapin, 1918) and Helen S (Wright and Wright, 1908) mines in the early part of the twentieth century (U.S. Bureau of Mines, Mine Production Records).

Based on the distribution and types of prospects, geology, geophysics, deposit models, and information from mineral exploration companies, this report delineates the Duncan Canal, Groundhog-Berg Basin, and Cornwallis Peninsula areas as “known mineral deposit areas” (KMDA’s). This implies that these areas have a higher relative likelihood for hosting a significant mineral deposit than other parts of the Stikine area.

The Duncan Canal KMDA, located along Duncan Canal, and on Woewodski and Zarembo islands, contains 19 sites with known or suspected VMS mineralization. These occurrences share Triassic host rocks of the Alexander terrane with deposits of known significance to the north, the Greens Creek Mine on Admiralty Island and the massive Windy Craggy deposit in northwestern British Columbia.

The Groundhog-Berg Basin KMDA is located on the mainland near Wrangell. It contains 20 prospects with replacement, skarn, polymetallic vein, and vein gold mineralization and also some potential for porphyry copper and molybdenum deposits. The deposits in the area are rich in silver, lead, and zinc and have attracted significant exploration over the years.

The Cornwallis Peninsula KMDA on the north end of Kuiu Island is host to several polymetallic replacement and polymetallic vein deposits of lead and zinc and several small deposits of barite and witherite. As they are presently understood, these occurrences are too small and

discontinuous to attract development. However, there are sufficient values and indications of extent to attract some exploration interest.

EXECUTIVE SUMMARY

OVERVIEW

In 1997 the U.S. Department of Interior, Bureau of Land Management (BLM), began a 4-year mineral resource assessment of the Stikine area in central Southeast Alaska. The 5.7-million-acre study area encompasses the mainland bordering Frederick Sound and Kupreanof, Coronation, Kuiu, Zarembo, Wrangell, Etolin, and other nearby islands (photo 1). The study area covers the Kupreanof, Petersburg, and Wrangell Mining Districts/Subdistricts and additional lands not included in adjacent mining district studies. As the primary land manager in the area, the U.S. Department of Agriculture, Forest Service, requested that the BLM assess the mineral potential in the Stikine area for the purpose of generating information that will aid the agency in future judgements regarding land management.

Photo 1. Aerial view of the Coast Range mountains. Mouth of the Stikine River on left; city of Wrangell on north end of Wrangell Island, mid-ground, center. Photo by P. Bittenbender.

This report serves as the final, comprehensive presentation of information gathered during the Stikine area study from 1997 to 2000. Description and assessments of 175 mineral occurrences, the most significant geophysical sites, and industrial mineral sites are described and evaluated herein. Over 55 new sites were added to the BLM's AMIS (formerly MAS) data base. Descriptions and details of all the geophysical sites are included in Bittenbender and others, 2000. Also, over 130 localities were sampled to follow up road systems on Kuiu Island, Kupreanof Island, Zarembo Island, Etolin Island, and the mainland; USGS geochemical anomalies; and mineral exploration company data. This report presents the analytical results from over 1,700 samples collected during the assessment of the Stikine area.

Mines, prospects, and mineral occurrences were selected for examination after information from a variety of sources was considered; these sources included the BLM's Alaska minerals database (MAS), U.S. Geological Survey reports, Alaska Division of Geological and Geophysical Surveys reports, unpublished company reports, claims data, and recommendations by area land managers, prospectors, and geologists. BLM personnel prioritized the sites by factoring details of deposit models, favorable geology, economic considerations, and the likelihood that a site would be developed. A mineral development potential (MDP) and mineral exploration potential (MEP) ranking were determined for each site selected for examination.

The MDP is the potential that a deposit will be developed as a mine, whereas MEP is the potential that a prospect will be targeted by future mineral exploration. The likelihood of development or future exploration is rated on a scale of low, medium, and high. As they are currently understood, the highest MDP rating is medium, which applies to only one prospect, the Lost Show, located in the Duncan Canal area. Eleven prospects in the Stikine area have high MEP ratings.

Based on mapped geology, airborne geophysical data, the distribution and types of deposits, deposit models, and mineral exploration company information, the Duncan Canal, Groundhog-Berg Basin, and Cornwallis Peninsula areas are delineated as “known mineral deposit areas” or KMDA’s (pl. 1). This delineation implies that these areas have a higher relative likelihood for hosting a significant mineral deposit than other parts of the Stikine area. All the KMDAs’ have at least one prospect with a high MEP and at least several with a medium MEP.

DUNCAN CANAL KMDA

The Duncan Canal KMDA has been a focus for mineral exploration for many years. Claims were originally staked in the area around the turn of the century. Significant exploration attention was refocused on the area following the discovery of the Green’s Creek deposit on northern Admiralty Island by Noranda in the late 1970's and the recognition that rocks correlative with the Greens Creek hosts extend to the Duncan Canal area (e.g., Zelinski, 1979?). Since the late 1970's, various mineral companies have staked claims in the area and prospected for VMS deposits similar to that of Greens Creek. (Greens Creek is currently being mined by Kennecott Greens Creek Mining Co. and is one of the nation’s largest silver producers; written commun., Kennecott Minerals Co..)

The Duncan Canal KMDA is centered on Duncan Canal on Kupreanof Island, but also includes Woewodski Island and the central part of Zarembo Island. It is about 59 miles long and up to 14 miles wide (pl. 1). It is comprised mainly of Triassic rocks on the eastern margin of the Alexander terrane within the Stikine study area. The boundaries of the KMDA were drawn to include the mapped Triassic rocks in the area (generally after Karl and others, 1999), but it also includes adjacent areas mapped as Devonian, Carboniferous, and Permian in age. The KMDA is defined by 19 VMS occurrences. In addition, the area hosts polymetallic replacement deposits, gold quartz vein occurrences, and the potential for porphyry deposits.

The VMS occurrences in the Duncan Canal KMDA are principally rich in zinc and lead, but locally include copper, gold, and silver. Barite is a constituent in many of the occurrences, but is only considered a potential commodity at the Castle Island Mine (map no. 36[1]).

[1]“map no.” refers to consecutive numbers assigned to mineral occurrences in the Stikine area. They are used to locate occurrences and sample locations on the plates and figures in this report.

Three of the deposits in the KMDA have been sufficiently explored to indicate resources or known extent and average grade: the Castle Island Mine (map no. 36), the Lost Show (map no. 47) and the Frenchie (map no. 66). Based on mine records, R.D. Carnes estimated the Castle Island Mine contains 705,000 tons of barite resources in irregularly shaped lenses and detrital material. These resources grade 85 percent $BaSO_4$ or greater, but are located at depths of at least 60 feet below sea level (R.D. Carnes, 1980; oral commun., 1999). Based on 16 diamond drill holes and surface sampling, the Lost Show has an estimated resource of 500,000 tons that average 8.1 percent zinc, 0.6 percent lead, and 2.5 oz/t silver (Terry, 1998). At the Frenchie prospect, Brewer (1979) estimates that a narrow, 460-foot-long sulfide band averages 0.047 oz/t gold, 0.42 oz/t silver, 0.55 percent copper, 0.08 percent lead, and 1.48 percent zinc. This estimate is based on only 13 samples (Brewer, 1979). The Lost Show and Frenchie are estimated to have a high MEP, whereas the Castle Island Mine is estimated to have a medium MEP.

GROUNDHOG-BERG BASIN KMDA

The Groundhog-Berg Basin KMDA is 5 miles wide and 13 miles long and is located on the mainland, approximately 13 miles east of Wrangell (figure 1). It consists of a belt of metamorphosed Paleozoic sediments and volcanics from 1.5 to 2.5 miles wide that is bounded on the east by a 60- to 70-million-year-old tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). A 16.3-million-year-old biotite granite stock and associated sills and dikes intrudes the metamorphic rocks and is related to at least some of the base and precious metal deposits in the KMDA (George and Wyckoff, 1973; AMAX Exploration Inc., 1981; Newberry and Brew, 1989).

Mineral exploration started in the Groundhog Basin area with the discovery of the Glacier Basin prospect in 1898 (Roppel, 1987). Since that time numerous investigators have staked claims and explored the area. Activity has included exploration by the Moneta Porcupine Co. in the 1950's. In 1965 Bunker Hill Co. explored the area with 31 diamond drill holes. Between 1968 and 1970, Humble Oil and Refining Co. drilled two holes through the ice of the Nelson Glacier that penetrated up to 620 feet of ice. From 1971 to 1973 El Paso Natural Gas Co. collared 15 drill holes, conducted geophysical surveys, blasted numerous trenches, and collected thousands of rock chip samples. Between 1976 and 1981, AMAX Exploration Incorporated mapped the area, drilled four holes, and collected thousands of samples in the vicinity of a biotite granite stock. This work was done to evaluate the potential for porphyry molybdenum deposits (AMAX Exploration Inc., 1979[?], 1981). Activity in the area extended to 1992 when Kennecott Exploration Co. briefly examined the property (Wakeman, 1992). As of 2002 there were no active claims in the Groundhog Basin area although four patented claims still cover part of the area.

The Groundhog-Berg Basin KMDA contains 20 prospects. These prospects are classified as polymetallic vein, polymetallic replacement, skarn, porphyry, and vein gold. The principal commodities are molybdenum, copper, and zinc in the porphyry deposits; zinc and lead in the polymetallic vein, polymetallic replacement, and skarn deposits; and gold in the vein gold deposit. In addition, silver is found in some of the vein, replacement, and skarn deposits, and tin is found in some of the replacement deposits. The most important prospects identified to date are the Groundhog Basin (map no. 98), North Silver North (map no. 93), North Silver Whistlepig Adit (map no. 95), East Marsha Peak (map no. 104), and Huff (map no. 107) prospects. All have a high MEP ranking except Groundhog Basin which has a medium MEP.

Both the U.S. Geological Survey and Bureau of Mines have conducted investigations in the area and estimated resources at the Groundhog basin deposit.. In 1943 the Bureau of Mines estimated resources at 120,000 indicated tons and 350,000 inferred tons at average grades of 8.3 percent zinc, 2.5 percent lead, and 2.0 oz/t silver with an average width of 4 feet (Muir, 1943).

CORNWALLIS PENINSULA KMDA

The Cornwallis Peninsula KMDA consists of nine prospects and occupies most of Cornwallis Peninsula, on the north end of Kuiu Island. It is approximately 6 miles wide and 15 miles long (pl. 1). The most significant known deposits in the area are Triassic, polymetallic vein and/or replacement deposits of mainly zinc and lead sulfides with associated silver. These deposits have been correlated with the Triassic VMS deposits in the Duncan Canal KMDA. They may represent subaerial deposits on the flanks of a rift system that produced the submarine Duncan Canal deposits (C.D. Taylor, oral commun., 2001)

The three most significant deposits in the Cornwallis KMDA are the Hungerford (map no. 6), Kuiu (map no. 8), and Skate Creek (map no. 10) deposits. All are estimated to have a medium or high MEP. The Kuiu prospect targets a replacement of dolomitic limestone with irregular pods of sphalerite and galena. Channel samples collected from the mined cut contained only 0.18 to 0.29 percent zinc (Roehm, 1938a). Select, high-grade samples collected from the cut during this study contained 9.15 to 21.72 oz/t silver, 10.31 to 20.54 percent lead, and 7.7 to 13.4 percent zinc (map no. 6.1, samples 9578, 9615).

At the Hungerford prospect, lead and zinc sulfides are disseminated in amygdaloidal basalt; they are also found as fracture- and open-space-filling veins in volcanics and volcanic breccia and as replacements of dolomite where it is cut by fractures. A 1949 Bureau of Mines drilling and sampling program estimated a resource of "...63,000 tons assaying 2.4 oz/t silver, 1.35 percent lead, and 0.45 percent zinc," (Thorne, 1950b, p.1).

At Skate Creek, zinc, lead, and barite mineralization occurs in shear and breccia zones in felsic volcanic rocks. The breccia zones are up to 60 feet wide and extend for approximately 350 feet along Skate Creek. The best sample of mineralized breccia was across 16 feet that contained 4,344 ppm zinc (map no. 10.5, sample 3879).

OTHER PROSPECTS OF NOTE

Six prospects located outside the three KMDA's described above are noteworthy because of their high grades, broad extents, or combination of anomalous samples, prospective deposit types, and relatively unexplored status. All have medium MEP's. The prospects are Port Malmesbury (map no. 14), Table Bay (map no. 15), Point Saint Albans (map no. 17), Alikula Bay (map no. 19), North Bradfield River Skarn (map no. 117), and Black Crag (map no. 114).

The first three are located on Kuiu Island and are associated with Cretaceous intrusions. Port Malmesbury and Point Saint Albans are hydrothermal vein occurrences whereas Table Bay is a skarn occurrence. The significance of the three is mainly due to the broad areal extent of the genetically related occurrences and the potential for a large mineralizing system on the southern end of Kuiu Island.

Alikula Bay is on the north side of Coronation Island. It consists of a pollymetallic, massive sulfide replacement of limestone. Samples across beach exposures up to 28 feet across ran as high as 8,483 ppb gold, 22.5 ppm silver, 7,515 ppm lead, and 4.89 percent zinc across 8 feet (map no. 19.5, sample 8763). Alikula Bay is within the Coronation Island wilderness area.

The North Bradfield River Skarn deposit is hosted in a roof pendant of metamorphic rocks within the Coast Range Batholith, 39 miles east of Wrangell. It was investigated in the late 1950's and early 1960's for its iron resources (Roberts, 1958; Utah Construction, 1960; 1962). Spread across 13 magnetite-copper lenses or zones, Utah Construction (1960) estimated 1,000,000 tons of proven and probable resources and 4,481,000 tons of possible resources that grade approximately 35 to 40 percent iron, 0.2 to 0.3 percent copper, and 3 to 4 percent sulfur. Subsequent work on the deposit has extended at least until the late 1970's (Nieman and Ellison, 1977).

The Black Crag copper-molybdenum porphyry prospect is located 37 miles east of Wrangell in Miocene intrusives (Elliott and Koch, 1981) of the Coast Range Batholith. The only reference to the prospect is an oral report (Paul Pieper, 1998) of drilling in the area in the 1950's. Mineralized float sampled by the BLM consists of quartz porphyritic rhyolite with molybdenum coatings along fractures; fine-grained, silicified felsite with seams of molybdenum; and silicified, iron-stained intrusive with pyrite and chalcopyrite. Grab samples from the molybdenum-bearing rocks contained 735 and 1,348 ppm molybdenum (map no. 114.2, samples 476, 480). The chalcopyrite-bearing rock contained 1,508 ppm copper (map no. 114.2, sample 8733) and a 0.3-foot-thick, iron-stained, silicified breccia cobble with a pyrrhotite matrix contained 93 ppb gold, 43.5 ppm silver, and 558 ppm zinc (map no. 114.1, sample 466). Samples from the area also contained anomalous quantities of rare-earth elements.

INDUSTRIAL MINERALS

The only mines currently operating within the Stikine study area are for the production of industrial minerals, specifically sand and gravel and shot rock. A number of state licensed rock quarries produce crushed stone for use in the immediate area, however the production of shot rock in the Stikine area is a fraction of the level of 1996, due in large part to the reduction in road building for logging operations. Sand and gravel usage has been more even due to its primary use as aggregate for concrete and pavement and because the two operators are equipped to barge material throughout Southeast Alaska.

Minor production of dolomite as a dimension stone for headstones has been from Ham (also known as Blake) Island. Garnet Ledge garnet gemstone production resulted in garnet waste sold for use as a refractory.

The most likely opportunity for development of a limestone deposit is a thick bed of Silurian age limestone along the west side of Saginaw Bay, on Kuiu Island, with a 15,000-foot beach exposure. Here, the bed is 1,000 feet thick, has a carbonate purity of 96.7 percent, and represents 25 million tons of raw material within a 1-mile radius of where docks could be built. The relatively high purity, large size, and proximity to easy transport would make this resource the most likely target for development of all the carbonate rock sites in the Stikine area.

CONCLUSION

The most significant mineral occurrences in the Stikine area are concentrated in the three KMDA's. All of the high MEP occurrences, most of the medium MEP occurrences, and almost half of the low MEP occurrences are located within the KMDA's, which constitute less than 10 percent of the Stikine area.

An approximate comparison can be made between the three KMDA's in the Stikine area based on the number of medium and high mineral exploration potential (MEP) rankings that each contains. The Duncan Canal KMDA has 5 high and 14 medium MEP's whereas the Groundhog-Berg Basin KMDA 4 high and 7 medium MEP's and the Cornwallis Peninsula KMDA has 1 high and 2 medium MEP's. In addition, only the Duncan Canal KMDA is known to contain VMS deposits, which have been the target of recent mineral industry exploration in the area. The Duncan Canal KMDA is, therefore, the most important in the Stikine study area and the most likely to attract future exploration activity.

The only mines currently operating within the Stikine study area are for the production of sand and gravel and shot rock. Sand and gravel is primarily used as aggregate for concrete and pavement and demand is such that two operators are equipped to barge material throughout Southeast Alaska.

Limestone along the west side of Saginaw Bay, on Kuiu Island, represents 25 million tons of raw material that has the purity and proximity to easy transport that makes it the most likely target for development of all the carbonate rock sites in the Stikine area.

ACKNOWLEDGMENTS

The authors would like to thank the people who graciously shared minerals information from the Stikine area. These include Dr. Phil Beardslee (photo 2), Bob Zorich, Mark Robinson, Paul Piper, Ken Eichner, and Cliff Taylor. We are grateful for the historic and current mineral exploration industry information that Cyprus AMAX Minerals and Boliden, Inc., shared with us. We thank numerous personnel from the USDA, Forest Services's Wrangell and Petersburg Ranger Districts for the information and logistical support they provided. Thanks go to the services of Temsco Helicopters, Alpine Helicopters, Prism Helicopters, and Coastal Helicopters, and the charter boat services of Gary McWilliams and the M/V Hyak. The figures in this report were created by Shirley Mercer, BLM Information Specialist, Juneau, Alaska. We are also grateful to Shirley for the support she provided in the field. Finally, the authors would like to thank Marki Stebbins, Aventurine Engineering, Inc., for her editorial contributions to this report.

Photo 2. Phil Beardslee and his son, David, displaying drill core from the Harvey Creek prospect. Photo by J. Still.

INTRODUCTION

This report contains information generated during a 4-year mineral assessment conducted by the U.S. Department of the Interior, Bureau of Land Management (BLM). The mineral potential within the Stikine area of central Southeast Alaska was the focus of the study (fig. 1).

Under Section 1010 of the Alaska National Interest Lands Conservation Act, 1980, the Secretary of the Interior is responsible for assessing the mineral potential of public lands throughout Alaska. In 1995 the BLM was assigned that responsibility. This study was done in accordance with Section 1010 at the request of the U.S. Department of Agriculture, Forest Service (Forest Service). Information gained from the assessment is of primary importance to that agency. As the major land manager in the area, the Forest Service requires a thorough understanding of the mineral endowment and its development potential in order to accomplish the agency's multiple-use management objective.

The BLM intends to define the mineral potential of the Stikine area by:

1. Identifying the number, type, and distribution of mineral deposits.
2. Determining resource estimates whenever possible.
3. Conducting economic feasibility studies for selected deposits.
4. Evaluating each deposit for its exploration and development potential and identifying areas with a concentration of deposits likely to be explored or developed.

To accomplish this, BLM personnel located, sampled, surveyed, and mapped mineral deposits at historic mines and prospects, in addition to performing reconnaissance investigations to identify new resources.

Preliminary results of field work done in 1997 were published in 1998 (McDonald and others, 1998). An interim report containing information gathered during 1997 and 1998, which includes individual property descriptions, was published in 2000 (Bittenbender and others, 2000). This report represents the final, comprehensive compilation of the information gathered during the study from 1997 through 2000.

Over 175 mineral occurrences, industrial mineral sites, and geophysical sites were examined during this study. The mineral occurrences and the most significant geophysical sites are shown on plate 1 and described in the text and listed in table A-1. Mineral sites either not found, sampled, or examined are located on plate 2 (D prefix) and listed in table A-1. The industrial mineral sites are shown on figure 34 and described in Appendix C. Descriptions and details of all the geophysical sites are included in Bittenbender and others, 2000. Sample locations for over 130 reconnaissance localities are shown on plate 2 (R prefix) and the analytical results given in table B-2.

More than 120 mines, prospects, and mineral occurrences are individually described in the main text. Each prospect description has sections on location and access, history, and mineral assessment. These site descriptions are organized within the text according to their geographic locations–beginning in the west with those on the most outboard islands within the study area and moving eastward to include those found on the mainland (pl. 1). Appendix A provides summary site information, including the latitude and longitude of each site, and is organized by map number as shown on plate 1. Analytical results for rock and stream sediment samples are presented in Appendix B. These are then subdivided into three tables: table B1 contains results from samples taken from known mines, prospects, and mineral occurrences; table B2 contains results of reconnaissance investigation samples: and table B3 contains results for rare earth elements.

The area under examination encompasses a variety of mineral deposit types, including volcanogenic massive sulfide (VMS), replacement, polymetallic vein, vein gold, skarn, porphyry molybdenum and copper, magmatic segregation, and veins of barite. In addition, there are minor deposits of placer gold, uranium, and coal.

This study delineates the Duncan Canal, Groundhog-Berg Basin, and Cornwallis Peninsula areas as "known mineral deposit areas" or KMDA's (pl. 1). These areas have a higher relative likelihood for hosting a significant mineral deposit than other parts of the Stikine area. The KMDA's are described with sections on location and access, history, geology, and prospect summaries, and follow the "Prospects in the Stikine Area" section. Each includes a summary prospect table (tables 4-6).

A summary of the most important prospects outside the KMDA's is included in the "Other Prospects of Note" section following the discussions of the KMDA's. These include all the prospects with a medium MEP in the study area, outside the KMDA's.

The prospects described in the KMDA discussions, along with the "Other Prospects of Note," constitute a summary of the most significant prospects in the Stikine area.

Industrial minerals studies included determining current production levels, locations of quarries and extraction sites, history and past production, consumption patterns, and past exploration. Tables 1 through 4 in Appendix C show how specifications for aggregate have become more stringent between 1988 and 1998, Table 5 gives analytical results for shot rock and sand and gravel samples collected by BLM workers, Table 6 is a compilation of carbonate rock analyses from samples collected by BLM workers and from other research, and Table 7 is a summary of industrial mineral occurrences.

PURPOSE OF PROGRAM

Mineral assessment studies in Alaska expand the public's minerals-related knowledge and support U.S. Department of the Interior policies, which improves Federal stewardship and land-use planning on public lands. The studies provide important geoscience, mining engineering, and mineral economic information that becomes part of a comprehensive inventory of resources on Federal land. The total data set allows physical, biological, and economic sciences to be considered in Federal land planning and decision making. The information and the resulting policies are necessary to ensure the sound use of natural resources, while preserving and protecting environmental and cultural values. Information provided by these studies is also useful to legislators, other land-managing agencies, and mineral industry leaders in their efforts to make informed decisions affecting future mineral resource activities and their associated socioeconomic effects on the State of Alaska.

Mineral assessment studies improve the understanding of the mineral development potential of an area by creating an inventory of mineral resources, evaluating the likelihood that more resources may exist, and estimating the technical, environmental, and economic feasibility of mining certain mineral deposits. They also review land-use and environmental issues as these relate to potential mineral development scenarios. The mineral assessments address specific data and analysis requirements mandated by the National Environmental Policy Act (NEPA), the Federal Land Management and Policy Act (FLPMA), the National Forest Management Act, the Alaska National Interest Lands Conservation Act (ANILCA), and other statutes.

Area-wide mineral assessments of Alaska are conducted in coordination with several Federal agencies. Historically, these have included the U.S. Bureau of Mines (Bureau of Mines), U.S. Geological Survey (USGS), BLM, and the Forest Service. Early in 1996, the Bureau of Mines was closed as an agency and its functions, personnel, and mandates in Alaska were transferred to the BLM under Secretarial Order 3196, dated January 19, 1996.

Under the Bureau of Mines and BLM mineral assessment program, several mining districts (including Goodnews Bay, Juneau, Valdez Creek, Colville, Ketchikan, and Chichagof-Baranof), national forests (Chugach), and BLM resource planning areas (Steese-White Mountains, Forty Mile, and Black River) have been investigated. Many of these studies have been conducted in coordination with State and nongovernmental organizations as well.

AUTHORITIES

In accordance with Section 1010 of the ANILCA (PL 96-487; 94 Stat. 2371) the Secretary of the Interior "...shall, to the full extent of his authority, assess the oil, gas, and other mineral potential on all public lands in the State of Alaska in order to expand the database with respect to the mineral potential of such lands. The mineral assessment program may include, but shall not be limited to, ... core and test drilling for geologic information....To the maximum extent practicable, the Secretary shall consult and exchange information with the State of Alaska regarding the responsibilities of the Secretary under this section and similar programs undertaken by the State." The Wilderness Act, National Environmental Policy Act (NEPA), and Federal Land Policy and Management Act (FLPMA) also require interdisciplinary resource assessments before a major Federal land-use decision is made on public lands.

PRIORITIES

Mineral assessment study areas are chosen using a prioritization process that weighs several factors, including land status, mining history, current prospecting activity, geologic potential, accessibility, and conflicting land uses. The extent and age of previous studies is also taken into account. Input from other Federal agencies and the State of Alaska are heavily weighted in the process of prioritization. For instance, the priorities of the Forest Service, the leading land manager in Southeast Alaska, were a major consideration in undertaking the Stikine area study.

METHODOLOGY

Mines, prospects, and mineral occurrences are selected for examination after considering information from several different sources. An initial list is compiled from the Minerals Availability System (MAS) database, which was created and maintained by the Bureau of Mines through 1995. The Alaska portion of the MAS database is currently maintained by the BLM and contains information on mines, prospects, and mineral occurrences throughout Alaska. Each site from the MAS list is reviewed and prioritized after the completion of a thorough literature search. Properties with multiple references and evidence of past production or development are given high priority. Sites where recent work or claim staking has been performed are given moderate priority for field investigation. The literature may reveal that some sites represent claim staking only; consequently, locations and information are scarce. These sites are given a low priority. The literature search may also reveal properties that were not included in the MAS database, but nonetheless merit investigation.

Previous studies by government agencies such as the USGS or Alaska Division of Geological and Geophysical Surveys (ADGGS) may contain geophysical or geochemical information on sites that warrant follow-up examination. Other factors that influence site selection include favorable regional geology and newly created access (e.g., logging roads, glacial retreat, etc.). Site examinations may also be recommended by area land managers, prospectors, and geologists.

LOCATION AND ACCESS

The Southeast region of Alaska stretches 560 miles from south of Ketchikan to Icy Bay northwest of Yakutat. The lands involved in this mineral assessment are located in central Southeast Alaska and are referred to here as the Stikine study area (fig. 1). "Stikine" is derived from a Tlingit name meaning "Great River." The Stikine River, the mouth of which is in the study area, is a historically important transportation route from the coast, through the Coast Mountains to the interior. Encompassing 5.7 million acres, the Stikine study area extends throughout all of the Forest Service's Petersburg and Wrangell Ranger Districts and parts of the Juneau and Thorne Bay Ranger Districts. It includes the Kupreanof and most of the Petersburg historic mining districts (Ransome and Kerns, 1954). From east to west, it stretches from the U.S.-Canadian border to the outboard islands of the Alexander Archipelago–including the islands of Wrangell, Etolin, Zarembo, Mitkof, Kupreanof, Kuiu, and Coronation, as well as numerous interspersed smaller islets. From north to south, it stretches approximately 100 miles on the mainland, from its northern boundary at the head of Endicott Arm, south to Bradfield Canal.

The geography of the Stikine area is diverse. To the east on the mainland, peaks reach altitudes of 10,000 feet. Ice fields and alpine glaciers predominate; the LeConte Glacier is the southernmost in North America to flow directly into salt water. Although the topography of the islands is generally subdued compared to elsewhere in southeastern Alaska (much of Kupreanof Island consists of extensive, flat, low-lying regions), peaks do reach altitudes of approximately 3,700 feet on both Kupreanof and Etolin Islands. The entire study area was glaciated in the geologically recent past.

Southeast Alaska is famous for its lush rainforest. The islands of the Alexander Archipelago are typical of this rainforest. Vegetation includes muskegs in poorly drained areas and thick conifer forests of primarily western hemlock, Sitka spruce, and scattered red and yellow cedar. The tree line is variable, but is generally found around an elevation of 2,000 to 2,500 feet.

The towns of Petersburg (photo 3) and Wrangell have the largest populations in the area–approximately 3,600 and 3,100 respectively. Each is served by daily scheduled jet service from the major Southeast cities of Juneau and Ketchikan (connecting to Seattle), scheduled Alaska Marine Highway System ferries, commercial barge companies, and local chartered air service. Smaller air taxi services also provide access between Petersburg and Wrangell, along with scheduled daily flights to other

Photo 3. City of Petersburg on the north end of Mitkoff Island. Wrangell Narrows in foreground, Frederick Sound and mainland in background. Photo by P. Bittenbender.

southeastern Alaska communities and charter services to remote areas. Helicopter service is available from Petersburg and on a prearranged basis from elsewhere in the study area. The two municipalities are the main supply centers in the area. Lodging is available from numerous establishments. Car rental is also available to access the network of roads extending from both cities. There are approximately 200 miles of roads extending from Petersburg and 140 from Wrangell; these include municipal, state, and Forest Service roads, both paved and unpaved.

Kake (population: 700) is located on western Kupreanof Island approximately 40 miles northwest of Petersburg (photo 4). It is served daily by scheduled flights from air taxi services and twice weekly by scheduled state ferry and barge service. Overnight accommodations are available. Car rental is negotiable. Generally to the north and east of Kake, an extensive logging road network includes Forest Service and Kake Tribal Corporation (the area's Native village corporation as established by the Alaska Native Claims Settlement Act of 1971) roads.

Photo 4. Aerial view of the village of Kake on northwestern Kupreanof Island. Photo by P. Bittenbender.

The climate of the Stikine area is moderated by maritime influences; summers are cool and winters are mild. Snow is common during the winter and at higher elevations, but rain falls at all times of the year. Wrangell and Petersburg experience similar average temperatures–30.5°F in January and 58.1°F in July. The average annual rainfall is higher in Petersburg, at 110 inches per year, as opposed to 82.4 inches in Wrangell. Snowfall in Wrangell is 64 inches. About half of the precipitation in the area falls in October, November, and December (www.wrangell.com and www.petersburg.org/visitors/climate.html).

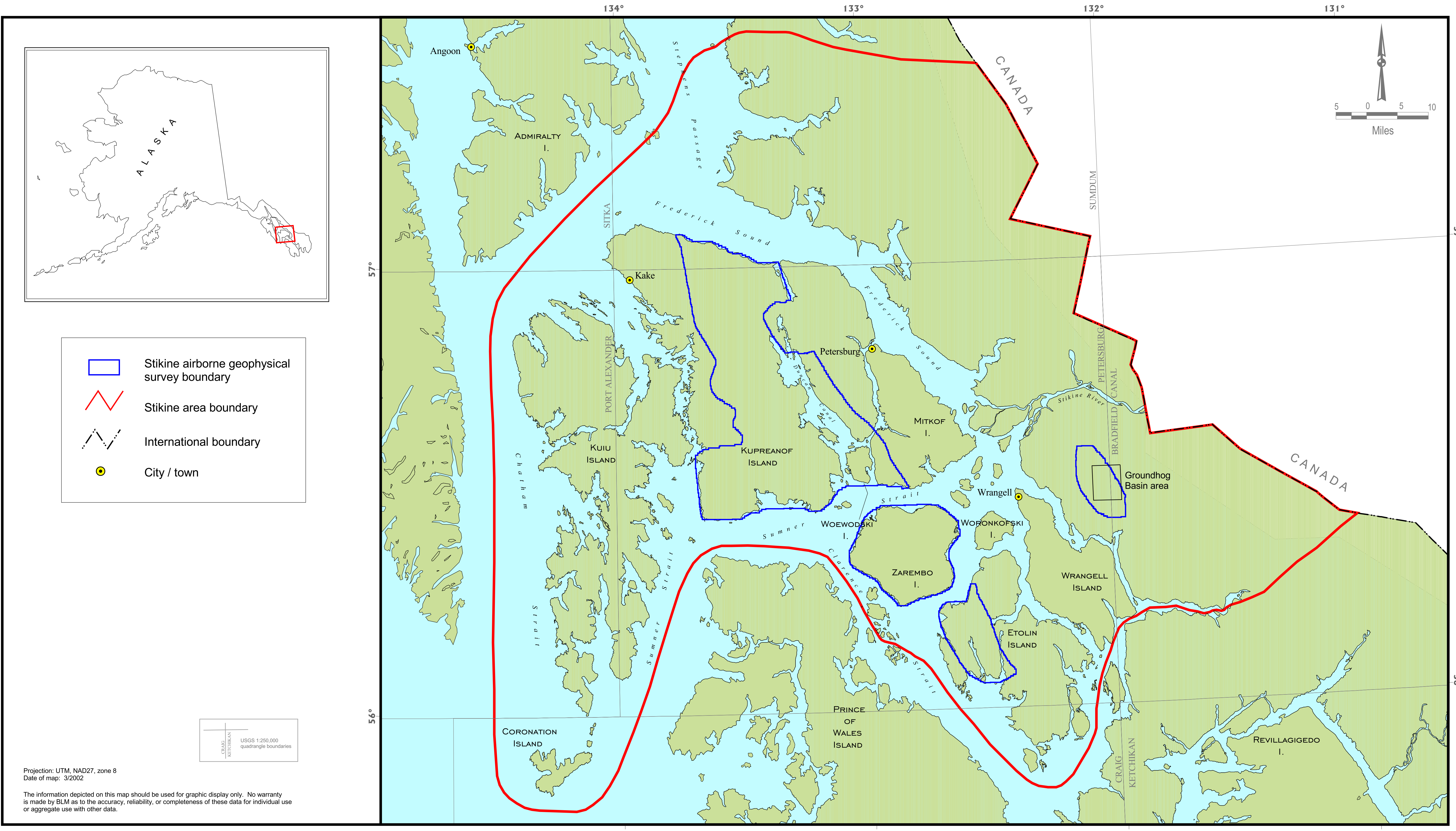


Figure 1. Location map of the Stikine area, central Southeast Alaska.

LAND STATUS

About 90 percent of the land in the Stikine study area is managed by the Forest Service (fig. 2). Much of that land is open to mineral entry; however the Stikine-Leconte, Petersburg Creek-Duncan Salt Chuck, and Kuiu wilderness areas are closed to mineral entry and development. Native lands are those that were withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by the area's Native regional and village corporations. Sealaska Corporation, the regional Native corporation, holds the subsurface mineral rights to all Native lands. Lease arrangements for mineral exploration and development must be negotiated with Sealaska prior to accessing their land holdings. The largest block of Native land in the study area is on the northwest end of Kupreanof Island, owned by the Kake Tribal Corporation. State lands in the area are concentrated near the towns of Petersburg and Wrangell as well as near Cape Fanshaw, Thomas Bay, the south end of Mitkof Island, on the northeast side of Zimovia Strait, and at the head of Bradfield Canal. Small private land parcels and active mining claims are scattered throughout the study area. One should consult the Forest Service, BLM, or State of Alaska to get more precise information on the land status in the Stikine area before commencing mineral exploration or development activities.

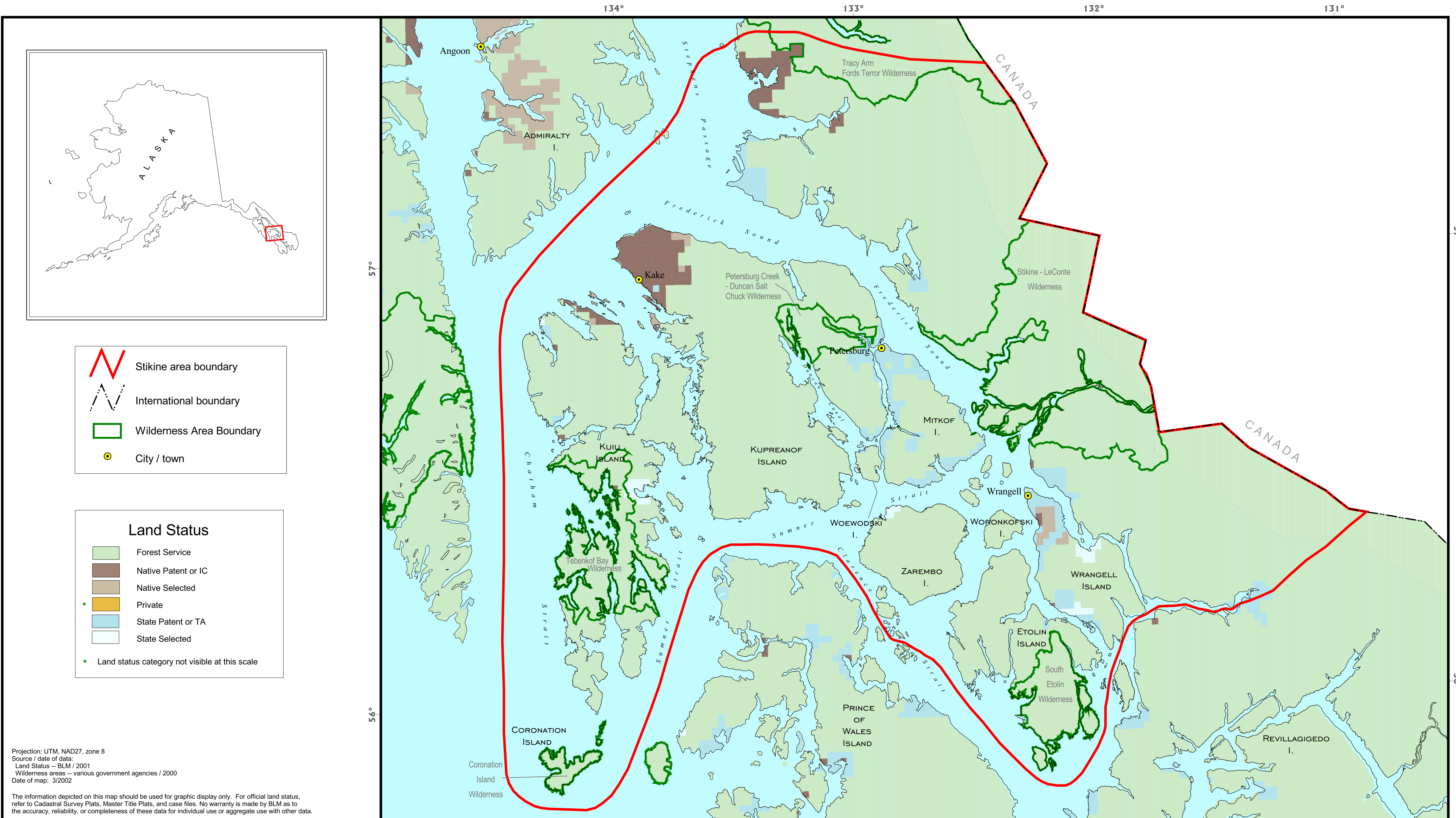


Figure 2. Generalized land status map of the Stikine area.

PREVIOUS STUDIES

Various Federal and State of Alaska personnel from the USGS, Territorial Department of Mines (TDM), Alaska Division of Mines and Minerals (ADMM), ADGGS, Bureau of Mines (USBM), and BLM have studied the geology and mineral deposits in the Stikine area since the early 1900's. The studies have emphasized area-wide and site-specific geology, geochemistry, and geophysics; specific commodities; and mineral resource summaries on a quadrangle and site-specific basis. Mineral industry companies have also been active in the area over the years. Reports resulting from private company investigations commonly summarize site-specific and regional exploration programs and although generally unpublished, are selectively available from the BLM - Juneau office. Additionally, students have written graduate theses covering various topics related to the geology and mineral resources in the area.

A compilation of previous studies is provided in table 1 and shown in figure 3. It is organized by quadrangle, scope, and source. Reports published by the USGS, TDM, and USBM in some cases overlap quadrangle boundaries and are shown in table 1 in each affected quadrangle. Unpublished, private sector reports, e.g., mineral exploration company reports, are listed as “other.” Regional studies that cover the entire state or all of Southeast Alaska are not listed unless the portion of the report pertaining to the Stikine area is listed.

Table 1. Previous study references by quadrangle

Quadrangle	Scope	Source	References
Sitka (114)	Area geology	USGS	Cathrall, 1983
	Mineral resources	USGS	Smith, 1998
		Other	Hedderly-Smith, 1990
Sumdum (115)	Area geology	USGS	Brew, 1984; Cathrall, 1983
		ADGGS	ADGGS, 1997a-m; Prichard, 1997
	Mineral resources	USGS	Smith, 1998
		USBM	Wright, 1945
		Other	Hedderly-Smith, 1990, 1993
	Site-specific	TDM	Williams, 1951a, 1952b, 1952
Port Alexander (116)	Area geology	USGS	Brew, 1984; Cathrall, 1983
	Mineral resources	USGS	Berg and Cobb, 1967; Berg, 1984; Grybeck and others, 1984
		Other	Hedderly-Smith, 1990
	Site-specific	Other	Berman, 1999

Table 1. Previous study references by quadrangle – continued

Quadrangle	Scope	Source	References
Petersburg (117)	Area geology	USGS	Brew, 1984, 1997a-m; Cathrall, 1983; Haeussler and others, in press; Karl and others, 1999
		ADGGS	ADGGS, 1997a-m; Prichard, 1997
	Mineral resources	USGS	Berg, 1984; Berg and Cobb, 1967; Berg and Grybeck, 1980; Buddington, 1923; Grybeck and others, 1984; Grybeck and Berg, 1998; Smith, 1998; Taylor, in press; Wright, 1909; Wright and Wright, 1905; Wright and Wright, 1908
		USBM	Van Alstine and Berryhill, 1963; Wright, 1945
		ADGGS	Eakins, 1975
		TDM	Roehm, 1940, 1942, 1945
		Other	Glavinovich, 1995; Hedderly-Smith, 1990
	Site-specific	USGS	Bressler, 1950; Burchard, 1914; Dickinson, 1979; Gault and others, 1953; Newberry, 1989; Philpotts, 1992; Ray, 1953
		USBM	Banister, 1962; Berryhill, 1964; Carnes, 1980; Jermain and Rutledge, 1949; Muir, 1943; Pittman, 1962; Rutledge, 1949; Thorne, 1948; Thorne, 1950a, 1950b; U.S. Bureau of Mines, 1944, 1945
		TDM	Fowler, 1948; Roehm,1937; Roehm, 1938a, 1938b; Roehm, 1946a-d; Williams, 1951; Williams, 1954
		Other	AMAX Exploration Inc., 1979; AMAX Exploration Inc., 1981; Amoco, 1979; Brewer, 1979; Bunker Hill Company, 1965a, 1965b; DeLancey, 1990; George and Wycoff, 1973; Hamilton, 1982a, 1982b; Holdsworth, 1980; Houston International, 1980; Humble Oil and Refining Company, 1970a, 1970b; Kazda, 1972; Milner, 1977; Nelson, 1931; Oliver, 1984; Quigley, 1973; Rockingham, 1996; Roppel, 1987; Roppel, 2001; Smith, 1943; Terry, 1998; USDA Forest Service, 1996; Wakeman, 1992; Wernecke, 1918; WGM Inc., 1976; Wiese, 1977; Williams and Decker, 1932; Zelinski, 1979?

Table 1. Previous study references by quadrangle – continued

Quadrangle	Scope	Source	
Bradfield Canal (118)	Area geology	USGS	Brew, 1997n; Cathrall, 1983
		ADGGS	ADGGS, 1997a-m; Prichard, 1997
	Mineral resources	USGS	Berg, 1967;Berg, 1984; Elliot and Koch, 1981; Koch and lliot, 1981; Koch, 1997; Smith, 1998
	Site-specific	USGS	Newberry and Eiiison, 1989; Sonnevil, 1981
		TDM	Williams, 1957
		ADMM	Race, 1963
		Other	AMAX Exploration Inc., 1979; AMAX Exploration Inc., 1981; Ball,1956; Berman, 1999; Bunker Hill Company, 1965a, 1965b; George, 1973; Hamilton, 1982a, 1982b; Humble Oil and Refining Company, 1970; Nieman and Ellison, 1977; Quigley, 1973; Roberts, 1958; Utah Construction, 1960, 1962; Wakeman, 1992; WGM Inc., 1976
Craig (119)	Area geology	USGS	Eberlein and others, 1983
	Mineral resources	USGS	Twenhofel and others, 1949; Wright and Wright, 1908
		TDM	Roehm, 1940, 1942

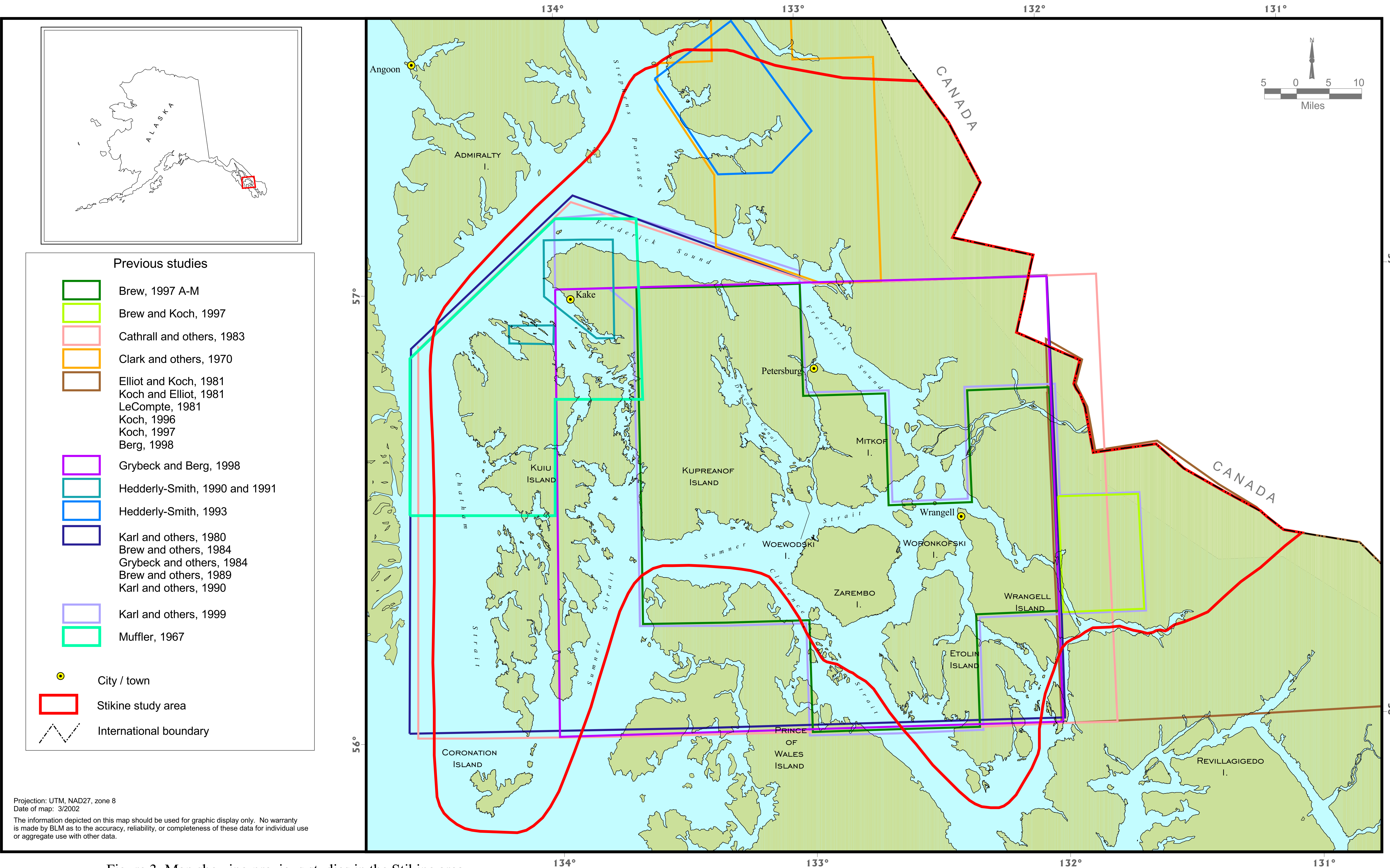


Figure 3. Map showing previous studies in the Stikine area.

MINING HISTORY/PRODUCTION

Two commodities were produced in the Stikine area: barite and gold. Barite was produced from the Castle Island Mine and gold was produced from both the Maid of Mexico and the Cascade mines. Three other properties, the Helen S, Hattie, and Harvey Creek, may have had a small amount of production. These three gold mines/prospects are located on Woewodski Island within a few miles of each other. The Cascade Mine is located on the mainland where gold was produced from narrow quartz veins mined underground.

The Maid of Mexico Mine had a 10-stamp Straube mill installed by about 1931 (Nelson, 1931). Bureau of Mines production records indicate the mine produced gold in 1915, 1930, 1931, 1933, and 1936. There is some confusion as to the units, i.e., dollars or ounces, used in the records, but it appears that 158 ounces of free milling gold and 1,038 ounces of gold from concentrate were produced (U.S. Bureau of Mines, Mine Production records).

The Helen S Mine had a 20-stamp mill installed by about 1904. It reportedly operated until 1905 with some small test production (Roppel 2001; Wright and Wright, 1908). Shortly after 1915, the mill was dismantled, and the property was abandoned (Berg and Cobb, 1967; Roppel, 2001).

At the Harvey Creek prospect, the portal of a caved adit and the remains of an old impact mill were found. A hand-drafted map of the northwest end of Woewodski Island shows a high-grade stringer located near the adit (Northwest Woewodski, 1933). Some production may have been realized from this vein and crude mill.

Surface and underground sampling of the Hattie prospect by the BLM failed to reveal significant gold values. Roehm reports that some of the Hattie ore was mined and transported to the mill at the Helen S Mine, where it was found that the mill results were low and the ore was not amenable to amalgamation (Rohm, 1945).

In 1948 the Cascade Mine produced 4 tons of ore yielding 6 ounces of gold and 1 ounce of silver. This production was reported to the Bureau of Mines by Don Thomas (U.S. Bureau of Mines, Mine Production Records).

The Castle Island Mine is located on a small island in Duncan Canal. In 1966 the Alaska Barite Co. acquired claims at Castle Island and started mining an outcrop on the northeast end of the island. Between 1966 and 1969, the company mined 234,000 tons of barite from above the high-tide line (Carnes, 1980). In 1969 Inlet Oil Corporation acquired the claims and proceeded to mine barite below tidewater. But in 1975 the company declared bankruptcy, and the mine was purchased by Chromalloy American. From 1970 to 1980, the companies mined 552,888 tons of barite from an underwater, open-pit operation. Drilling and blasting liberated the ore, which was recovered by a clam-shell crane (Carnes, 1980). In 1980 with economic reserves exhausted, the mine closed, and by the next year, the mill and most of the camp were removed (R.D. Carnes, oral commun., 1995). By 1996 all mining equipment and signs of habitation had been removed from the island. The site is now overgrown with alder and brush.

General Geology and Deposit Types

Eight tectonic assemblages are present within the Stikine area (fig. 4). They represent a diverse array of rock types ranging in age from Paleozoic to Holocene (Gehrels and Berg, 1994; Brew and others, 1984). The eight assemblages include five lithic and three tectonostratigraphic terranes. Some of the mineral deposits found in the Stikine area are restricted to certain tectonic assemblages. From west to east, the terranes are the Alexander, Taku, and Stikinia. The lithic assemblages include the Gravina Belt overlap sequence, metamorphic rocks within the Coast Range Batholith, plutonic rocks of the Coast Range Batholith, plutonic rocks west of the batholith, and Quaternary and Tertiary volcanic and sedimentary rocks. The assemblages generally form elongate, northwest-trending belts (Gehrels and Berg, 1994).

Volcanogenic massive sulfide (VMS) deposits are the most significant in the Stikine area. They occur in Triassic rocks on the inboard margin of the Alexander terrane and are part of a 375-mile-long belt that stretches the entire length of Southeast Alaska. The belt includes the Greens Creek deposit on northern Admiralty Island, approximately 80 miles to the northwest of the Stikine area, and the Windy Craggy deposit, approximately 230 miles to the northwest, in British Columbia, Canada.

Within the Stikine area, the VMS deposits in the Alexander terrane extend along both sides of Duncan Canal on Kupreanof Island, south across Zarembo Island, and onto the western side of Etolin Island. (See plate 1 for geographic references.) They are hosted in volcanic and sedimentary rocks of the Hyd Group as mapped by Karl and others (1999). Triassic carbonates in the area contain replacement-type minerals that may also be related to the VMS deposits, e.g., the lead-zinc-barite deposits on Cornwallis Peninsula on northern Kuiu Island (C.D. Taylor, oral commun., 1998).

Two subterranes of the Alexander terrane, known as the Craig and Admiralty subterranes, date from Paleozoic to Cenozoic and make up the western part of the Stikine area. These subterranes are interpreted as distinct crustal fragments only until Permian time; from that point, their depositional and tectonic histories appear similar (Gehrels and Berg, 1994). Triassic VMS and related deposits in the Stikine area are, therefore, not affected by the distinction in the subterranes.

Rocks of the Jurassic to Cretaceous Gravina Belt overlie the eastern margin of the Alexander terrane. In light of information generated by the recent airborne geophysical survey, work by Karl and others (1999) suggests that the Gravina Belt rocks do not extend as far to the west on Kupreanof Island as earlier maps have depicted. This means that the Alexander terrane is exposed farther to the east than previously thought, and therefore, the potential for Triassic VMS deposits is also extended eastward.

Within the study area, the Taku terrane is exposed to the east of the Gravina Belt and consists of deformed and metamorphosed rocks of pre-Permian (?) to Late Triassic age (Gehrels and Berg, 1994). To the southwest, Taku rocks are thrust over the Gravina Belt. To the northeast, they have been intruded by the Coast Range Batholith, and the terrane boundary has been obscured. Metamorphic pendants and inliers in the batholith are indistinguishable from Taku terrane rocks to the west (Gehrels and Berg, 1994). Although the mineralized rocks of Groundhog Basin are hosted in the Taku terrane, they are secondary deposits related to the much later intrusion of rocks of the Coast Range Batholith (Newberry and Brew, 1989).

The Coast Range Batholith makes up the eastern side of the Stikine study area. It consists mainly of two belts of plutonic rocks: the Great Tonalite Sill Belt (L. Cretaceous to Early Eocene) and the Coast Mountains Belt (Early Eocene to Middle Eocene) (Brew and Morrell, 1983; Brew, 1994). Younger plutons (Late Oligocene to Miocene) are also found within the batholith, specifically around Groundhog Basin and in the Cone Mountain area (Brew, 1994). Mineral occurrences in the batholith include polymetallic skarn deposits and small, structure-controlled polymetallic veins. The area also holds the potential for resources of porphyry molybdenum, uranium, and rare-earth elements.

Rocks of the Stikinia terrane are mapped in only a few places within the study area (Gehrels and Berg, 1994). However, the terrane hosts numerous mineral deposits in Canada–of particular interest are the precious metal deposits of the Iskut Camp and the precious and base metal-rich deposits to the south in the Stewart Mining Camp. The potential exists for related deposits in the Stikine area.

Cenozoic rocks west of the Coast Range Batholith are found in a belt of Late Oligocene to Miocene plutons that extends the length of Southeast Alaska (Brew, 1994). As it appears in the study area, it is referred to as the Kuiu-Etolin Volcanic-Plutonic Belt and mainly consists of granitic rocks with some diorites to gabbros. It is exposed on northern Kuiu Island, southwestern Kupreanof Island, Zarembo Island, and Etolin Island (Brew and Morrell, 1983; Brew and others, 1984).

Tertiary volcanic rocks in the study area are related to the intrusives of the Kuiu-Etolin Volcanic-Plutonic Belt. They are made up of basalt and andesite flows, rhyolite flows and tuffs, and volcanic breccias (Brew and others, 1984). A field of Holocene volcanics of mainly olivine basalt lies on southern Kupreanof Island (Brew, 1994). Although color anomalies in the young volcanics attracted the attention of investigators, no significant deposits have been found to date. Analysis of geochemical samples from the area has revealed the potential for rare-earth elements (Smith, 1998).

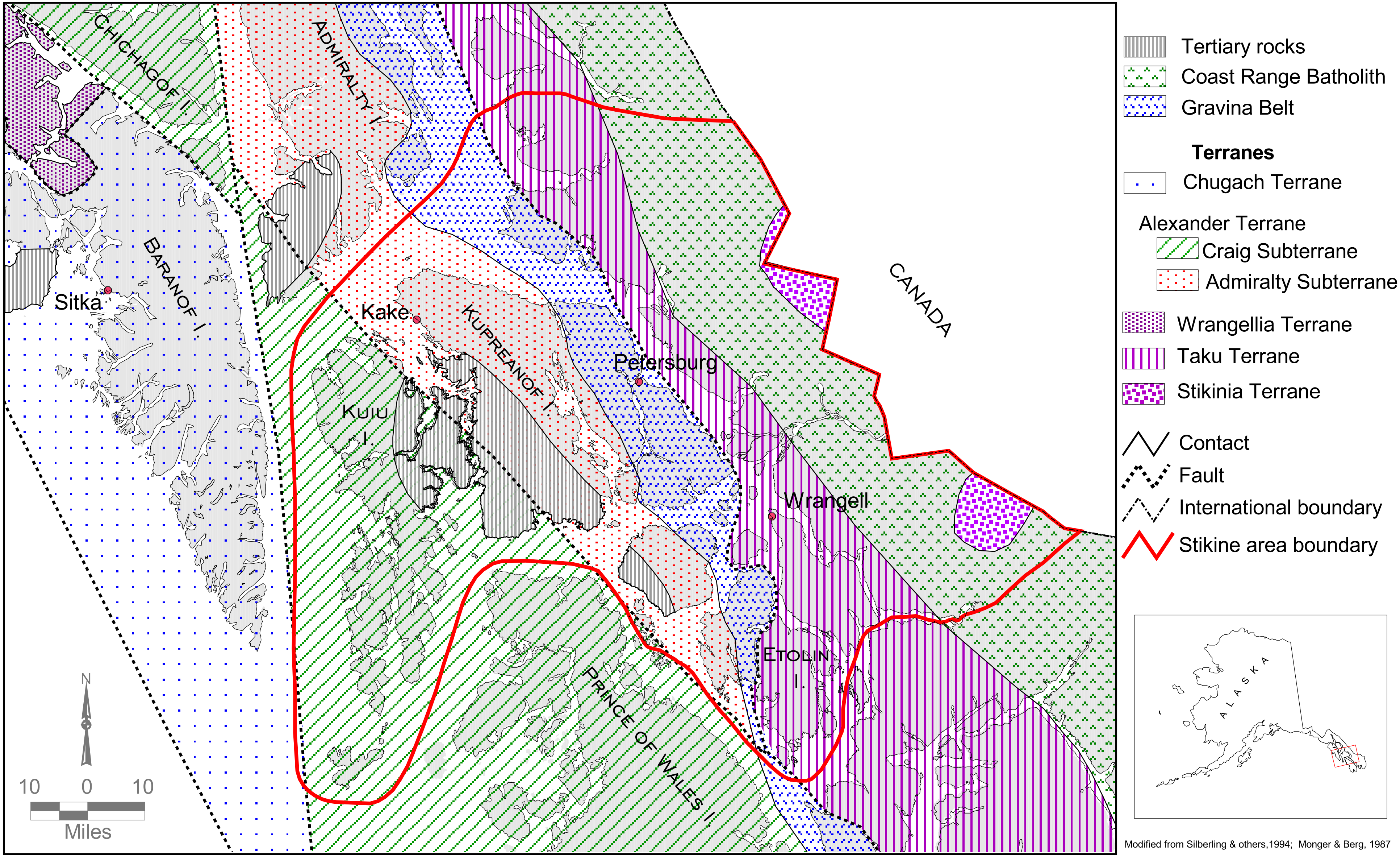


Figure 4. Tectonostratigraphic terranes and physiographic provinces in the Stikine area.

AIRBORNE GEOPHYSICAL SURVEY

The Stikine airborne geophysical survey was conducted by the BLM in partnership with the city of Wrangell and administered by the ADGGS. The primary targets of the survey were VMS deposits hosted in Triassic rocks on Zarembo and Etolin Islands and in the Duncan Canal area of Kupreanof Island. Total field magnetics and three frequencies of electromagnetic (EM) data were collected by a geophysical contractor from helicopter-borne instrumentation flying at an altitude of 100 feet (30 m) with a line spacing of a quarter of a mile (400 m). The survey covered approximately 1,100 square miles (5,032 line miles) in 5 survey blocks (fig. 1). Field data were collected between March and May, 1997. Final survey products were released to the public in September, 1997. A full description of the survey equipment, logistics, results, and contractor personnel is available from the ADGGS (ADGGS and others, 1997).

The USGS followed up the Stikine geophysical survey in the Duncan Canal and Zarembo Island areas in 1998 and 1999 with new geologic mapping (Karl and others, 1999), structural analysis (Haeussler and others, in press), re-analysis of stream sediment samples (Smith, 1998), ground-based geophysical traverses (Wynn and others, in press), and geophysical modeling (McCafferty and others, in press). The BLM used much of this information, specifically the new geologic mapping, geochemistry, and geophysical modeling, in its follow-up of the geophysical survey (Bittenbender and others, 2001).

The BLM conducted a geochemically based follow-up of the Stikine geophysical survey in 2000 that concentrated on the belt of Triassic rocks in the Duncan Canal/Zarembo Island/Etolin Island area that has the highest potential for hosting a VMS-type deposit (Bittenbender and others, 2001). The belt has been described as the Duncan Canal/Zarembo Island/Screen Island sub-belt by Brew and others (1984), in which the VMS potential was described by Berg and Grybeck (1980). In the late 1970's various mineral exploration companies targeted the area after recognizing the similarity or continuity of the rocks with those hosting Noranda's Greens Creek discovery to the north (e.g., Amoco Minerals Company, 1979).

The Stikine geophysical survey also targeted replacement-type deposits in the Groundhog Basin area and rare-earth occurrences on the northeastern end of Prince of Wales Island. Neither of these areas was targeted by the BLM's geophysical follow-up in 2000 (Bittenbender and others, 2001).

Results of the BLM's follow-up of the Stikine airborne geophysical survey in the Duncan Canal to Etolin Island VMS belt are presented in a report by Bittenbender and others (2001). During the BLM's follow-up, investigators collected 255 stream sediment and 227 soil samples to evaluate geophysically anomalous zones defined by the geophysical survey contractor (Pritchard, 1997). Thirty figures present the results of stream sediment and soil sampling by displaying the distribution of anomalous sample results for each of 15 elements selected to indicate the potential for VMS-type mineral occurrences in the area. The report also describes 10 "Anomalous Areas" where a concentration of anomalous stream sediment and/or soil samples indicate a potentially mineralized area (Bittenbender and others, 2001).

PROSPECTS IN THE STIKINE AREA

KUIU ISLAND

ALLIED MINE GROUP E
(Plate 1, Map no. 1[2])

MAS no.:	0021160022	*Quadrangle:*	Port Alexander D1
Deposit Type:	Vein: Ba	*Latitude:*	56.9078
Land Status:	Open Federal	*Longitude:*	-134.2952
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access
The Allied Mine Group E is on northwest Kuiu Island at the mouth of Saginaw Bay. It lies 14 miles from Kake. Barite veins are exposed along a rocky, wave-worn point on the southwest side of the bay near the high-tide line. The site can be reached by boat, float plane, or helicopter during low tide.

History
The Allied Mine Group E was originally staked for barite in 1955 by Roy and Rachel Strong (Alaska Kardex, 116-002E). No exploration work or additional activity is reported.

Mineral Assessment
The deposit lies within a narrow exposure of Silurian or Devonian volcanic breccia (Muffler, 1967). A few pillow structures are also distinguishable in the volcanics. The barite is present as a series of pods and irregular veins that strike 000° to 033° and dip 40° to 46° to the southeast. Veins range in width from 0.1 to 1.4 feet and in length from a few feet to 80 feet. The barite is pinkish white, fine to coarse grained, and is commonly found in association with carbonate minerals, which may include witherite. No sulfides were found associated with this deposit. Field relations show the barite veins are crosscut by younger faults in the volcanics.

BLM personnel took three samples of different barite veins cropping out intermittently across the property. Barium values ranged from 31 to 41 percent (map no. 1.1 , samples 9604-9606) indicating barite percentages of approximately 53 to 70 percent.

Conclusions
This site is characterized by narrow, discontinuous, and scattered veins of barite in subeconomic concentrations. No attempt was made to trace the veins inland due to the extensive cover.

[2]"map no." refers to consecutive numbers assigned to mineral occurrences in the Stikine area. They are used to locate occurrences and sample locations on the plates and figures in this report.

CORNWALLIS PENINSULA

(Plate 1, Map no. 2)

MAS no.:	0021160008	*Quadrangle:*	Port Alexander D1
Deposit Type:	PV: Ba, Zn	*Latitude:*	55.9156
Land Status:	Open Federal	*Longitude:*	-134.3295
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Cornwallis Peninsula occurrence includes approximately 2 miles of beach on the northeast shore of Kuiu Island, 10 miles southwest of Kake. The beach is a broad expanse of gravels and outcrop exposed during low tide. Access to this area is via boat, float plane, or helicopter at low tide.

History

Barite, witherite, and calcite were first discovered at this site by Hungerford, who staked three claims in 1923. Additional claims were staked by Barrows later in 1923 (Buddington, 1925); George Comstock, in 1931; and Jack Whitfield, Lueria Jordan, and Pete Hooper, in 1949 (Alaska Kardex, 116-001A). No exploration activity has been reported.

Mineral Assessment

The Cornwallis Peninsula occurrence is hosted almost entirely within the Triassic Keku Volcanics. However, at the northwestern edge, the Keku Volcanics are in contact with the overlying Triassic Cornwallis Limestone (Muffler, 1967). Fracture-filling veins of barite and witherite as well as fine-grained, disseminated pyrite, sphalerite, and a trace of chalcopyrite make up the occurrence.

Barite stringers and veins occur in felsic volcanics, volcanic breccia, and limestone. The stringers and veins trend generally northwest to northeast with steep to near-vertical dips. Veins vary in width from 0.1 to 2.3 feet and can be traced along strike for up to 200 feet. A 2-foot-wide barite vein, hosted in felsic volcanics and traceable for approximately 200 feet, contained 28.30 percent barium (map no. 2.3, sample 155). A 300-foot-wide zone of barite stringers and veins is hosted in limestone, conglomerate, and fossiliferous mudstone. A sample of a 2.3-foot-wide vein in this zone contained 44.46 percent barium (map no. 2.3, sample 9612).

Disseminated pyrite, sphalerite, and chalcopyrite are contained in conglomerate and iron-stained volcanics. A sample from a conglomerate with disseminated sulfides in the matrix contained 660 ppm copper and 553 ppm zinc (map no. 2.3, sample 156). A sample of iron-stained volcanics with disseminated sphalerite and pyrite contained 8,382 ppm zinc (map no. 2.2, sample 167).

While investigating the southwest shoreline of one of the islets just offshore of the main deposit, BLM personnel observed disseminated pyrite, sphalerite, and galena in a Carboniferous crinoidal limestone (Muffler, 1967). A sample from this location contained 5.72 percent zinc and 660 ppm lead (map no. 2.4, sample 9611).

Conclusion

This occurrence is characterized by scattered veins and stringers of barite and low-grade, disseminated sulfides–including sphalerite, plus minor chalcopyrite and galena. There is sufficient extent of mineralization to attract some exploration interest.

KEKU ISLET

(Plate 1, Map no. 3)

MAS no.:	0021160012	*Quadrangle:*	Port Alexander D1
Deposit Type:	PV: Zn	*Latitude:*	56.1111
Land Status:	Open Federal	*Longitude:*	-134.1797
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Keku Islet occurrence lies less than a mile offshore of Kuiu Island, on one of the many islets that dot Keku Strait. It is 7.5 miles southwest of Kake. The deposit is located along the northwest shoreline of the island and is covered at high tide. Access to the islet is best accomplished by boat or float plane. Helicopter access is possible during low tide.

History

The zinc occurrence at Keku Islet was first described by Buddington (1925) during a visit to the area in 1923. The Bureau of Mines examined the property in 1949. At that time, three claims were held by Jack Whitfield, Lueria Jordan, and Pete Hooper called the Spallright 1, 2, and 3. The Bureau of Mines concluded that the quantity of mineralized rock was insufficient to warrant further development (Jermain and Rutledge, 1949).

Mineral Assessment

The larger island of the Keku Islands has been mapped as Permian Halleck Formation that has been intruded by numerous gabbro dikes (Muffler, 1967). The country rock can be divided into three major types: a tan, well-bedded, bioturbated (scattered burrows) limestone that strikes 010° to 050° and dips between 18° and 20° to the southeast; a thinly interbedded sandstone and mudstone; and a poorly sorted, pebble conglomerate. These units are cut by a system of subparallel, Triassic or Tertiary mafic dikes that strike 286° to 292° and dip 81° to 84° to the northeast. The dikes are aphanitic, black to mottled brown, and have altered, tan margins.

The Keku Islet occurrence is associated with one of the mafic dikes, which is cut at nearly right angles by several small veinlets of sphalerite to form ladder veins. The dike extends 240 feet from tide water across the intertidal zone to vegetative cover and has an average width of 10 feet. The sphalerite veinlets range from 0.1 to 2.0 inches in width and strike 005° to 030° with nearly vertical dips. A few sphalerite veinlets also trend parallel to the dike. Pyrite is associated with some of the sphalerite veinlets. Calcite veinlets also crosscut the dikes.

BLM personnel mapped and sampled the two most heavily mineralized outcrops of the ladder-veined dike. They took six continuous chip samples across several sphalerite veinlets cutting the dike (map no. 3.1, samples 161, 9617-21). All the samples contained high zinc, and most had anomalous amounts of tungsten. Zinc values ranged from 7,773 ppm to 13.6 percent and tungsten values from less than 20 to 149 ppm. The tungsten values are directly proportional to zinc values in all six samples. However, in samples with zinc concentrations over 1.0 percent, analytical interference will cause tungsten values to be enhanced.

Field personnel mapped and sampled another similarly mineralized dike approximately 0.75 miles (straight-line distance) southeast of the one at the Keku Islet deposit. Discontinuous outcrops of the dike extend northwest along the beach for approximately 350 feet with an average width of 8 feet. Investigators collected five continuous chip samples from the area with the most significant concentration of sphalerite veinlets in the dike. The samples ranged in length from 0.07 to 1.75 feet and assayed from 6.1 to 31.7 percent zinc (map no. 3.3, samples 162-166). Tungsten values ranged from 58 to 254 ppm.

Conclusions

Sphalerite mineralization at the Keku Islet deposit is characterized by fracture-filling veins in mafic dikes. These very small, widely spaced veinlets are found in a small percentage of the dikes on the island. The zinc values across the sphalerite veinlets range from 7,773 ppm to 31.7 percent. The limited extent of mineralized veinlets at the Keku Islet deposit discourages further exploration.

SAGINAW BAY

(Plate 1, Map no. 4)

MAS no.:	0021160059	*Quadrangle:*	Port Alexander D1
Deposit Type:	Unknown	*Latitude:*	56.8950
Land Status:	Open Federal	*Longitude:*	-134.1838
Development:	1 DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

At one time, the Saginaw Bay prospect included a block of claims covering sections 24, 25, and 36 of T. 57 S., R. 71 E. on the Port Alexander D-1 quadrangle. The block extended across the center of Cornwallis Peninsula on northern Kuiu Island, approximately 10 miles southwest of Kake. The occurrence can be reached by boat or helicopter, although on the north side of the peninsula landing zones are scarce.

History

Between 1978 and 1979, Mapco, Inc. staked 108 claims in the Saginaw Bay area and listed zinc and lead as target commodities (Bureau of Land Management, MAS). The company's drilling program was limited to one hole that was located in the west-central part of section 24, T. 57 S., R. 71 E. of the Port Alexander D-1 quadrangle (Hedderly-Smith, 1993).

Mineral Assessment

The Saginaw Bay prospect includes four stratigraphic units as mapped by Muffler (1967). The various rock types and orientations on the claim block are (1) Carboniferous crinoidal limestone, north-central; (2) the Permian Pybus Formation, southern; (3) the Triassic Keku Volcanics, central (and structurally highest); and (4) the Triassic Cornwallis Limestone, extreme northwestern.

BLM personnel investigated the Pybus Formation along a small creek at the southern end of the claim block. The creek is located adjacent to the ruins of an old cannery on the northeast shore of Saginaw Bay. Field personnel collected one stream sediment and two rock chip samples (map no. 4.1, samples 151-153). None of the these contained significant base or precious metal concentrations. The stream sediment sample, however, returned 1,079 ppm barium (map no. 4.1, sample 153).

Conclusions

It is not known what the original discovery was at this prospect or what the drilling target was besides the general lead and zinc commodity description. There is not sufficient information nor values to attract exploration.

LITTLE CREEK

(Plate 1, Map no. 5)

MAS no.:	0021160033	*Quadrangle:*	Port Alexander D1
Deposit Type:	Unknown: Au?	*Latitude:*	56.5735
Land Status:	Native	*Longitude:*	-133.0582
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Low

Location/Access

The Little Creek deposit is on the north shore of Cornwallis Peninsula on Kuiu Island, 8.5 miles southwest of Kake. Reports indicate it lies approximately 0.25 miles inland, at an elevation of 200 feet (Bureau of Land Management, MAS). Access to this area is via boat, float plane, or helicopter to the beach and then overland by foot. The occurrence is on land that was withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by Sealaska and Kake Tribal corporations (the area's Native regional and village corporations) and is currently listed as interim conveyed, pending patent. Lease arrangements for mineral exploration and development must be negotiated with these entities prior to accessing their land holdings.

History

Little Creek was staked in 1969 by G. Fennimore, H.W. Coleman, A.J. Tanner, and L. Strong. It consists of only one claim, listed as a lode gold deposit. There has been no activity recorded since the original staking (Alaska Kardex, 116-031).

Mineral Assessment

The Little Creek area consists of Triassic Keku Volcanics (Muffler, 1967). Limited outcrop appears to be mostly rhyolite flows with scattered jasper veinlets. Above an elevation of 180 feet, the country rock is more altered, and outcrops of coarse volcanic breccia are present.

Because little information about this property exists, mineralized targets are poorly defined. BLM personnel collected two samples along a very small creek, presumably Little Creek, which ends in a 10-foot-high waterfall at the beach. A stream sediment sample contained 401 ppm lead and 176 ppm barium (map no. 5.1, sample 159). This lead value corroborates an anomalous lead value previously reported by Cathrall and others (1983) of 300 ppm. A sample of altered volcanics contained 1,359 ppm barium (map no. 5.1, sample 160).

Conclusions

Although the Little Creek area was originally staked for gold, only trace amounts of gold were obtained from a stream sediment sample taken in the vicinity of the deposit. However, anomalous lead values were obtained. Altered rhyolites contain veinlets of jasper along with barium and traces of zinc. The anomalous but low metal values do not encourage further exploration.

KUIU
(Plate 1, Map no. 6)

MAS no.:	0021160003	*Quadrangle:*	Port Alexander D1
Deposit Type:	PR: Ag, Pb, Zn	*Latitude:*	56.8978
Land Status:	Native	*Longitude:*	-134.1053
Development:	DDH (14), Adit, Cuts	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Medium
Alternate names:	Kuiu Zinc-Lead, Kuiu Lead-Zinc		

Location/Access
The Kuiu prospect is along the northeastern shore of Cornwallis Peninsula, on the north end of Kuiu Island, 8 miles southwest of Kake. The workings are located approximately 800 feet inland. They lie at an elevation of 80 feet, on the east bank of a small north-flowing stream. The area is thickly wooded, and the stream contains abundant dead fall. The topography is gently sloping from the beach to the workings, but steepens inland from there. The beach is accessible by boat, float plane, or helicopter at low tide. Travel inland is by foot along the creek. The deposit is on land that was withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by Sealaska and Kake Tribal corporations (the area's Native regional and village corporations) and is currently listed as interim conveyed, pending patent. These entities must be contacted prior to accessing their land holdings.

History
Mineralized rock was first discovered at the Kuiu prospect by Ted Hungerford prior to 1937. By 1937 a group of 32 lode claims, called the Keku Group, had been staked by I.M. Hofstad, L. Dyrdahl, and H. Hawkes (Roehm, 1937). Dyrdahl continued to hold these claims, with various partners, at least until 1951 (Williams, 1951b).

Between 1937 and 1938, 150 to 200 tons of high-grade zinc and lead ore were removed from an opencut at the Kuiu prospect and piled in the creek approximately 600 feet inland from the beach (Roehm, 1938b). This rock was reported by the owners to contain 4 to 18 percent zinc, 5 to 6 percent lead, trace to 0.07 oz/t gold, and 0.6 to 5.9 oz/t silver (Thorne 1948). However, channel samples taken from the opencut by Roehm (1938b) contained only 0.18 to 0.29 percent zinc across 5 feet. A select grab sample from the ore pile in the creek ran only 2.75 percent zinc (Roehm, 1938b). The BLM found no reports of what was done with the stockpiled lead-zinc ore.

A 55-foot adit, with a winze and 25-foot sublevel, was completed on the Kuiu prospect sometime prior to Roehm's visit in 1946. No specific information detailing who did the work or when it was done could be found. Reports indicate that the lead-zinc ore was not intersected in the workings. By 1946 the winze and sublevel were reportedly flooded (Roehm, 1946a).

The owners of the Kuiu Lead-Zinc prospect carried out a drilling program sometime around 1946. The Alaska Territorial Department of Mines assisted this project with geologic mapping, logging drill core, and locating drill targets (Roehm, 1946a). Approximately 14 diamond drill holes were completed, although the exact number and total feet is uncertain. No significant intercepts or resources were defined by the drilling program.

Mineral Assessment

The Kuiu prospect is located in the Triassic Keku Volcanics (Muffler, 1967). A detailed geologic map of the prospect, produced by Roehm (1946a), depicts a sequence of felsic lavas and agglomerates that are overlain by dolomitic limestone with localized replacement-type mineralized rock. The dolomitic limestone is, in turn, overlain by slightly mineralized agglomerates and capped by a unit of intermediate lavas. This rock package has been gently folded along a northwest to southeast fold axis and faulted (Roehm, 1946a).

The mineralized rock at the Kuiu Lead-Zinc prospect is hosted primarily by dolomitic limestone that is locally replaced by small irregular bodies and pods of sphalerite and galena. The original showing on the property was located approximately 600 feet inland on the south bank of the creek, apparently where the creek makes a sharp bend. This showing was mined out (Roehm, 1938b) and not observed during the BLM's visit. However, a detailed petrographic examination of the ore revealed very fine grained sphalerite in small, rounded masses. Galena was described as subordinate (Roehm, 1937). This irregular ore body was depicted as 30 feet long, 40 feet wide, and exposed along its dip for 200 feet (Roehm, 1938b).

A small adit, driven into the dolomitic limestone, is located approximately 200 feet upstream from the original showing. No mineralization is intercepted by these upper workings, which confirms earlier reports (Roehm, 1946a). The winze and sublevel are flooded. A surface cut, located on a steep face of the stream bank just upstream from the adit, does contain small pods of galena and sphalerite replacing dolomite. The pods are irregularly spaced and 2 to 3 inches in scale. Conspicuous, black manganese oxide coats the outcrop. High-grade samples from this cut contained 313.6 ppm to 21.72 oz/t silver, 10.31 to 20.54 percent lead, and 7.7 to 13.4 percent zinc (map no. 6.1 , samples 9578, 9615).

A third exposure of mineralized dolomite was described in a small creek, parallel to and east of the original mined-out showing. Here a 15-foot width of dolomitic limestone with disseminated galena reportedly crops out in the creek bed, roughly on strike with the other two showings (Roehm, 1937).

The BLM surveyed for radioactivity near the Kuiu workings using a hand-held scintillometer. Background readings are 60 counts per second, with readings inside the adit ranging between 100 and 150 counts per second.

Conclusions

Previously reported high lead and zinc values, as well as those obtained in this study, encourage additional investigation of the Kuiu prospect. Because of the irregular nature of the replacement-type mineralization and reports of minor mineralized areas in the vicinity, care should be taken to investigate all exposures of the dolomitic limestone; for instance, the small parallel stream to the east may have mineralized rock along strike from the adit. Sampling of the adit would be useful to verify whether minerals of interest are present, especially the very fine grained sphalerite described by Roehm (1937), which might not show up readily in hand specimens. The agglomerate units noted here should be compared to the green volcanic breccias seen at the Hungerford prospect (map nos. 8.1-8.2), located 1.4 miles southeast along the beach. If the two units correlate, the potential exists for a replacement-type deposit structurally below the Hungerford prospect.

KATHERINE

(Plate 1, Map no. 7)

MAS no.:	0021160013	*Quadrangle:*	Port Alexander D1
Deposit Type:	PV: Ba, Zn	*Latitude:*	56.1595
Land Status:	Open Federal	*Longitude:*	-132.6444
Development:	Pit	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Katherine occurrence is on one of the Keku Islets off the northeastern end of Kuiu Island, 7 miles southwest of Kake. The occurrence lies along the shoreline, on the northeast and northwest ends of the islet. These locations can be observed during low to medium tides. Access is via boat, float plane, or helicopter at low tide.

History

Discoveries of barite and witherite at this location were first discussed by Buddington (1925). He described fissure-filling veins of barite at the northeast end of the island. In 1949 Jack Whitfield, Lueria Jordan, and Pete Hooper staked the Acme No. 1 and No. 2 claims (Rutledge, 1949). The Acme No. 2 was staked over the discovery mentioned earlier by Buddington (1925). The Acme No. 1 was staked on a similar zone at the northwest end of the island. These were later restaked in 1953 as the Katherine claims (Alaska Kardex, 116-001B). The only reported exploration is a "test pit" on the Acme No.1 claim (Rutledge, 1949).

Mineral Assessment

The island is made up of Silurian Kuiu Limestone, which has been locally faulted and intruded by gabbro dikes (Muffler, 1967). The limestone contains short veins, stringers, and small pods of barite and witherite.

At the northwest end of the island, BLM personnel sampled a barite stringer zone 1.5 feet wide, striking 338° and dipping 70° to 90° to the northeast (map no. 7.1, sample 9613). The zone contains both irregular stringers and small pods of coarse-grained, bladed barite along with scattered sphalerite and galena. Sample 9613 contained 3.2 percent zinc, 2,355 ppm lead, and 24.22 percent barium. A large stringer of witherite, extending 46 feet and having a strike of 004° to 025° and a dip of 75° to 85° to the southeast, was reported by Twenhofel and others (1949) at this location.

At the northeast end of the island, the limestone contains a zone of vuggy quartz veins and stringers, with drusy quartz lining the vugs. The zone is approximately 50 feet wide and extends 50 feet to tide water. It contains stringers of barite and pyrite with trace galena and pods of massive pyrite up to 0.6 feet wide and 1.0 foot long. The orientations of the veins, stringers, and pods are highly variable. Two samples were collected at this location. Pods of barite with pyrite, oriented north-south, contained 1,602 ppm arsenic and 7,107 ppm barium (map no. 7.2, sample 9614). A sample of a pyrite lens contained 2,725 ppm arsenic and 8,498 ppm barium (map no. 7.2, sample 157).

Conclusions

This deposit includes relatively wide zones of fissure-filling veins of barite and small, discontinuous sulfide lenses in limestone. Mineralized rock was observed at both the northwest and northeast ends of the island, but the relationship between the two locations is unknown. There is not sufficient extent to attract exploration.

HUNGERFORD

(Plate 1, Map no. 8)

MAS no.:	0021160004	*Quadrangle:*	Port Alexander D1
Deposit Type:	PR, VMS?: Pb, Zn, Ag	*Latitude:*	56.5472
Land Status:	Native	*Longitude:*	-133.0390
Development:	5 DDH, cuts	*MDP:*	Low
BLM work:	Sampled	*MEP:*	High

Location/Access

The Hungerford prospect is along the beach on the northeast side of Kuiu Island, 7.5 miles southwest of Kake. The occurrence extends inland from the beach along a medium-size creek, locally called Hungerford Creek, that flows to the northwest. The shoreline southeast of the mouth of Hungerford Creek is steep, with bluffs adjacent to the intertidal zone. To the northwest, the shoreline is made up of moderately sloping gravel beaches. The area can be accessed by boat, float plane, or helicopter at low tide. This area was withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by Sealaska and Kake Tribal corporations (the area's Native regional and village corporations) and is currently listed as interim conveyed, pending patent. These entities must by contacted prior to accessing their land holdings.

History

Mineralized rock at the Hungerford prospect was first discovered by E.S.'Ted' Hungerford in 1937 (Thorne, 1948), and in 1938 he staked the Children group of claims, presumably at the location of his discovery the year before. These included six placer and two lode claims (Alaska Kardex, 116-003). The lode claims were reported by Roehm (1938a) to contain mineralized dolomite and conglomerate and to extend 3,000 feet inland from the mouth of Hungerford Creek. The placer claims, also described by Roehm (1938a), covered the area between the coast and the first mountain ridge inland. These contained considerable amounts of manganese. There is no report of how long these claims were held.

Conflicting reports indicate that in 1948 the Hungerford prospect was restaked. Thorne (1950a) states that six claims, the Hope 1 to 6, were staked by F.M. Hungerford and D.M. Hungerford in July 1948. However, Thorne (1948) also reports that E.S. Hungerford staked four claims in the same area–the White Hope, Bantam, Winner, and Heavyweight–in June of 1948. Regardless, by October 1948, the property was deeded to the Q-U Mining and Milling Co. by F.M. and D.M. Hungerford. Development on the property included a small cabin, several opencuts, blasting, and drilling (Thorne, 1950a).

At the request of the owner, the Bureau of Mines carried out a limited drilling program in January and February of 1949. The program consisted of drilling, sampling, and mapping the property and resulted in 982 total feet of diamond drilling in five holes (Thorne, 1950b).

Mineral Assessment

The Hungerford prospect is in the Triassic Keku Volcanics, very near an inferred fault contact with the lower volcanic member of the Carboniferous Saginaw Bay Formation and Silurian Kuiu Limestone (Muffler, 1967). During its investigation of the property in 1949, detailed mapping by the Bureau of Mines delineated six distinct units and three different types of lead-zinc mineralization. These units include (1) a slightly mineralized, poorly sorted, green, white, and red conglomerate exposed in the bed of Hungerford Creek, (2) an interbedded basalt and metamorphosed shale, (3) a dolomitic limestone with replacement mineralization along fractures, (4) a graywacke, (5) a gray to green amygdaloidal basalt with disseminated galena and sphalerite, and (6) a massive basalt with galena in narrow veins of quartz and calcite (Thorne, 1950a). These units seem to roughly correlate with those reported at the top of the Keku Volcanics by Muffler (1967). However, it should be noted that the unit mapped by the Bureau of Mines as a conglomerate appears to more closely resemble a sequence of green volcanics that has been fractured, with emplacement of pinkish barite, jasper, and disseminated galena in the fractures.

At the Hungerford prospect, lead and zinc mineralization appears in amygdaloidal basalt as disseminated galena and sphalerite. This can be seen in outcrop along a small bluff approximately 100 to 200 feet southeast of the mouth of Hungerford Creek. A sample of very fine grained, disseminated galena and sphalerite from this outcrop assayed 84.7 ppm silver, 2.23 percent lead, and 7,028 ppm zinc (map no. 8.2, sample 154). The Bureau of Mines drilling program defined this unit as the “ore body” and estimated a resource of “...63,000 tons of submarginal ore assaying 2.4 oz/t silver, 1.35 percent lead, and 0.45 percent zinc” (Thorne, 1950b, p.1). The mineralized rock delineated by the diamond drilling and eight surface channel samples has an approximate thickness of 78 to 93 feet, trends northwest to southeast along a strike length of 280 feet, and dips 34° to the northeast. This mineralized unit runs into Keku Strait, both along the strike to the northwest and down dip to the northeast. It is open along strike to the southeast, and similar mineralization was reported by F.M. Hungerford approximately 1,000 feet to the southeast of the delineated deposit. The diamond drilling indicates that the grade of the mineralized rock tends to decrease with depth (Thorne 1950a, 1950b).

Galena and sphalerite also appear as a stockwork of veins within a very conspicuous unit of fractured green volcanics in the bed of Hungerford Creek. This unit was previously mapped as a conglomerate (Thorne, 1950a). The sulfides are disseminated in a gangue of barite and jasper. A sample from this location yielded 16.4 ppm silver, 5,625 ppm lead, 6,019 ppm zinc, and 14.60 percent barium (map no. 8.2, sample 158). A similar unit crops out along the beach 1,400 feet to the northwest and has been described in earlier reports as the Hungerford “beach deposit” (Thorne 1950a). The outcrop displays textural evidence of open-space filling by pink barite and galena and subsequent brecciation (photo 5). A sample from this outcrop contained 5.82 oz/t silver, 2.84 percent lead, 2,228 ppm zinc, and 70 ppm barium (map no. 8.1, sample 9577). Similarly mineralized rock was reportedly located on the beach 500 feet to the southeast of Hungerford Creek (Thorne 1950b).

Sphalerite and galena have also been reported to replace dolomite, where the dolomite is cut by fractures (Thorne, 1948). Thorne (1948) describes this replacement-type mineralization as cropping out in the "Bluff Deposit" located in the bluffs along the beach, presumably near the mouth of Hungerford creek.

Conclusions

Lead and zinc are found disseminated in amygdaloidal basalt, as fracture- and open-space-filling veins in volcanics and volcanic breccia, and as replacing dolomite where it is cut by fractures. A BLM sample of mineralized amygdaloidal basalt, though not representative of the ore body, compared well with the grades reported by the Bureau of Mines (Thorne, 1950b). Further investigation of this property is warranted to characterize the prospect more completely and attempt to better define the extent of the mineralized rock to the southeast. Additionally, the sulfide replacement of dolomite at the "Bluff Deposit" should be looked at more carefully and compared to the sulfide replacement in dolomites at the Kuiu prospect (map nos. 6.1-6.2) located 1.4 miles to the northwest.

Photo 5. Mineralized breccia of green tuff. Seams and disseminations of galena and sphalerite with pink barite. Photo by P. Bittenbender.

CORN

(Plate 1, Map no. 9)

MAS no.:	0021160035	*Quadrangle:*	Port Alexander D1
Deposit Type:	PR: Ba, Zn	*Latitude:*	56.9204
Land Status:	Open Federal, Native	*Longitude:*	-134.1858
Development:	3 or 4? DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Corn group of claims is on the northeast shore of Cornwallis Peninsula on northern Kuiu Island. The claims cover almost 1.8 miles of bluffy shoreline from the Hungerford prospect (map no. 8) southeast to a prominent point on Cornwallis Peninsula. The claims extend inland to the south and southwest approximately one to two miles and cover mixed forest and muskeg inland from the beaches. Rock exposure is confined mostly to the shoreline and creeks. The shoreline is accessible by small boat, float plane, or helicopter at low tide. Access inland must be by foot or helicopter, since the northeasternmost extent of the Kuiu Island logging roads ends short of the southern boundary of the claims. Much of the area was withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by Sealaska and Kake Tribal corporations (the area's Native regional and village corporations). The land status is currently a mixture of selected Native and patented Native, including interim conveyances as well as open Federal land. Permission must be attained before accessing Native land holdings.

History

From 1973 to 1974, two men, presumably working for Resource Associates of Alaska (RAA), staked the Corn group of claims, which consisted of 121 adjoining placer and lode claims (Alaska Kardex, 116-033). These were leased to Cominco America in the mid-1970's, which then carried out detailed sampling, geophysical surveying, and a limited drilling program consisting of only two to three diamond drill holes. Mapco, Inc. also leased the Corn claims from RAA sometime in the late 1970's and drilled at least one diamond drill hole in the area (but the description of its location is not on the Corn group of claims). RAA allowed the claims to lapse sometime in the 1980's (Hedderly-Smith, 1990).

Mineral Assessment

The Triassic Keku Volcanics crop out across most of the Corn claims. However, in the southeastern and northeastern corners of the claim block, Triassic Cornwallis Limestone is exposed. The north-central part of the claims includes an uplifted block of Carboniferous volcanic rocks (Muffler, 1967).

BLM personnel accompanied by a USGS geologist investigated the northern part of the claim block; this included starting in the area of Hungerford Creek, going upstream to an upper tributary, and continuing up this northeast-flowing tributary to an elevation of 420 feet. Throughout the examination, field personnel observed mottled, light-brown-weathering rhyolite (maroon on fresh surfaces). In places, the rhyolite is brecciated. Barite was found in the upper tributary at elevations of 280 feet, 290 feet, and 400 or 420 feet. The lower exposure is a series of small pods, veins, and stringers of coarse-grained barite hosted in rhyolite. These outcrops are exposed intermittently across 200 feet of the creek bed. A barite boulder 1.3 feet long, 0.8 feet wide, and 0.6 feet thick was encountered in the main creek at 290 feet elevation. A sample of this boulder ran 28.41 percent barium and 1.5 percent zinc with traces of copper and lead (map no. 9.1, sample 9610). At an elevation of 400 or 420 feet, small veins of barite are found in rhyolite with disseminated pyrite.

Conclusions

The examination up Hungerford Creek revealed a thick section of rhyolite volcanics without significant sulfide concentrations and only a few barite veins. Sulfide mineralization appears to be confined to the vicinity of the Hungerford prospect along the faulted contact with older Carboniferous volcanics and Silurian marine clastic rocks. An examination of the shoreline to the east and up the small creek that empties into Keku Strait in the southeastern corner of section 34, T. 57 S., R. 72 E. would allow a comparison of the upper rhyolite section to that observed in Hungerford Creek.

SKATE CREEK

(Plate 1, Map no. 10)

MAS no.:	0021160067	*Quadrangle:*	Port Alexander, D1
Deposit Type:	PV, VMS?: Zn, Ba	*Latitude:*	56.8700
Land Status:	Open Federal	*Longitude:*	-134.0397
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Skate Creek occurrence is exposed in Skate Creek, which flows to the north into Keku Strait 7.5 miles southwest of Kake on northern Kuiu Island. It is part of the historic Corn group of claims (map no. 9), but is a distinct occurrence and was evaluated for different commodities. Access to the mouth of the creek is easy by boat or float plane. Helicopter access to the mouth of the creek must be done at low tide. The occurrence itself is approximately 2,000 feet upstream, to the south, from the mouth of the creek at elevations of approximately 170 to 200 feet. It can be reached by foot along the creek.

History

The history of the Skate Creek prospect is tied to that of the Corn claims (map no. 9), which were staked in 1973 and 1974 by J. Pray and J. Fitzgerald (Alaska Kardex, 116-33; 116-35) who apparently were associated with Resource Associates of Alaska. The claims were optioned by Cominco America and then by Mapco Inc. The companies did mapping, sampling, geophysical surveys, and limited diamond core drilling (Hedderly-Smith, 1993). However, the extent of the work done on the Skate Creek occurrence is unclear. An unpublished Cominco report in 1991 identifies Skate Creek and describes mineralized rock similar to that described by Resource Associates of Alaska in 1981 (Hedderly-Smith, 1993). The Corn claims lapsed in 1982. Sealaska geologists collected stream sediment and rock-chip samples from Skate Creek in 1992 (Hedderly-Smith, 1993).

Mineral Assessment

The Triassic Keku Volcanics crop out in the vicinity of the Skate Creek occurrence. Muffler (1967) describes the unit as a sequence of felsic and mafic volcanic rocks with intercalated clastic rocks. It is dominantly felsic flow rock and flow breccia (Muffler, 1967). Hedderly-Smith (1993) describes the breccias in the Skate Creek area that host the mineralization as fault breccias or de-gassing breccias. He suggests that these may be feeder zones for overlying volcanogenic massive sulfide (VMS) deposits or carbonate-hosted replacement deposits that are found elsewhere on Cornwallis Peninsula, or they may be stratabound zones that indicate the potential for VMS mineralization (Hedderly-Smith, 1993).

Mineralized rock at the Skate Creek occurrence consists predominantly of sulfide- and barite-bearing breccias in felsic volcanic rocks. The breccia zones are up to approximately 60 feet wide and trend generally to the north to northwest (fig. 5). The occurrence extends for approximately 350 feet along Skate Creek in a north-south direction and across approximately

200 feet east-west. The breccia zones are commonly in fault contact with the hosting massive, felsic volcanic tuffs. They are commonly silicified and pyritized with some calcification. Sulfides include pyrite, sphalerite, and minor galena along with barite. The sulfides are mainly associated with the matrix of the breccias. Toward the upstream end of the occurrence there appears to be more calcite and chalcopyrite associated with the breccia zones. Higher-grade parts of the breccia zones seem to be associated with faults. Here the sulfides may be massive in veinlets, veins, and lenses up to 6 inches thick. Barite-rich veins with pyrite, sphalerite, and galena cut the breccia zones in some places and also represent higher-grade parts of the occurrence.

BLM personnel mapped the exposure of mineralized rock along Skate Creek (fig. 5) and collected 28 samples to evaluate the occurrence. The highest commodity values were for zinc and barite, but several of the samples with the highest-grade zinc and barite were collected from float below the occurrence (up to 11.8 percent zinc, map no. 10.4, sample 3878; up to 25 percent barium, map no. 10.2, sample 3873). Measured samples with the highest zinc values included 2.2 percent zinc over 2.0 feet (map no. 10.20, sample 8779) and 16 feet at 4,344 ppm zinc (map no.10.5, sample 3879). Measured samples with the highest barium values included 27 percent barium over 2.0 feet (map no. 10.8, sample 3881) and 3.9 percent barium over 16 feet (map no. 10.6, sample 3880).

BLM personnel collected samples with copper values up to 4,333 ppm and lead up to 1,356 ppm, but these samples were across narrow intercepts. The highest gold value from the sample set was 63 ppb (map no. 10.18, sample 8780) and the highest silver was 31.8 ppm (map no. 10.20, sample 8779).

The BLM collected 6 samples that were over 10 feet long to represent the broader breccia zones (map nos. 10.5-10.26, samples 3879-80, 3882, 3888, 3891-92). Values from these samples ranged up to 4,344 ppm zinc, 3.9 percent barium, 156 ppm lead, and 116 ppm copper.

Conclusions

The mineralized breccias at the Skate Creek occurrence are similar to others reported in the Hungerford Creek area by Hedderly-Smith (1993). Hedderly-Smith suggested that these may be feeder zones for overlying VMS deposits or carbonate-hosted replacement deposits that are found elsewhere on Cornwallis Peninsula or they may be stratabound zones that indicate the potential for VMS mineralization (Hedderly-Smith, 1993). Alternatively, the breccia zones may be epigenetic and may not be related at all to the Triassic mineralization with VMS potential in the area.

The grades are low at the Skate Creek occurrence, and by itself, the occurrence may be of little significance. However, the extent of mineralized rock at the site is relatively large. In addition, the similarity between the Skate Creek mineralized breccias and mineralized breccias to the west, further broadens the extent of mineralization in the area and raises the possibility that larger and/or higher-grade deposits may exist. This possibility is likely to encourage further exploration in the area.

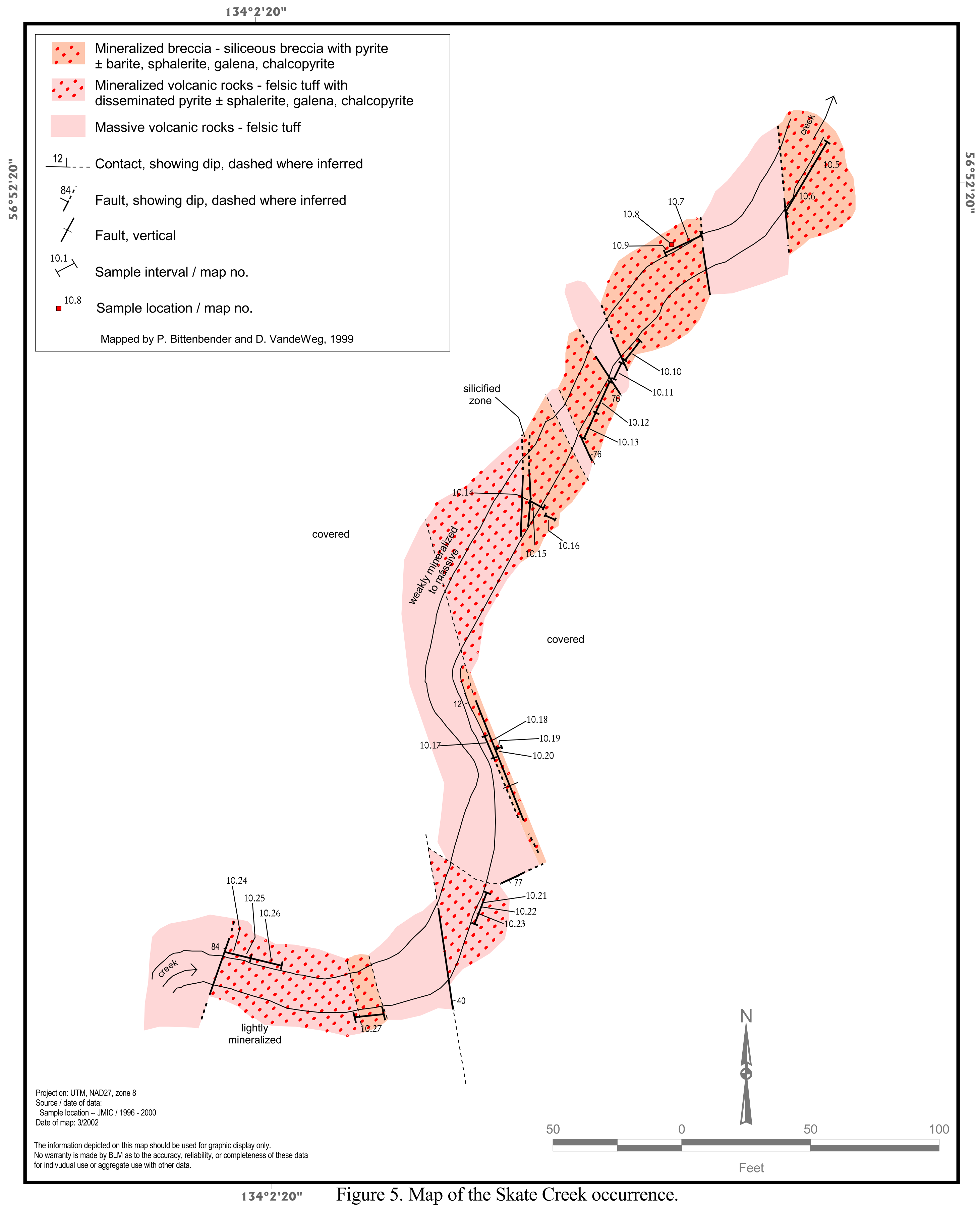


Figure 5. Map of the Skate Creek occurrence.

SAGINAW BAY BARITE

(Plate 1, Map no. 11)

MAS no.:	0021160015	*Quadrangle:*	Port Alexander D1
Deposit Type:	Vein: Ba	*Latitude:*	56.8746
Land Status:	Open Federal	*Longitude:*	-134.2233
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Saginaw Bay Barite occurrence is on northwest Kuiu Island, midway along the southwest shoreline of Saginaw Bay, 12.5 miles southwest of Kake. The property lies along a narrow, rocky beach that drops steeply to the water. Access is via boat or float plane.

History

The discovery of barite at the Saginaw Bay Barite prospect is first mentioned by Buddington while describing his field work in 1923 (Buddington, 1925). No staking or exploration activity is mentioned by him, nor are there any other subsequent references.

Mineral Assessment

Barite at the Saginaw Bay occurrence is hosted in vuggy, black-weathered, thinly bedded limestone that strikes 320° and dips 50° to the northeast. The unit has been mapped as Silurian Kuiu Limestone by Muffler (1967). The barite crops out in a series of irregularly spaced, subparallel veins exposed along approximately 200 feet of shoreline. The veins strike 355° to 025° and dip 60° to 80° to the west. They pinch and swell along strike and have widths ranging from stringers to 2.5 feet. The most extensive vein is traceable along strike for 20 feet before being obscured by vegetative cover and tide water. The veins are composed of pinkish white, coarse-grained blades of barite with subordinate calcite stringers and, likely, witherite.

Two samples were taken of the barite veins exposed along the shoreline. Results show barium values between 37 and 42 percent (map no. 11.1, samples 148, 9607).

Conclusions

The presence of barite here is restricted to relatively small veins that are widely spaced. Similar to others on Cornwallis Peninsula, this occurrence, as exposed, is subeconomic.

KADAKE BAY

(Plate 1, Map no. 12)

MAS no.:	0021170199	*Quadrangle:*	Petersburg D6
Deposit Type:	Sedimentary: U308, REE	*Latitude:*	56.9884
Land Status:	Native	*Longitude:*	-133.9591
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Kadake Bay occurrence is on northeastern Kuiu Island along a small peninsula bounded to the west by Kadake Bay and to the east by Port Camden. It is 12 miles south of Kake. The occurrence is exposed near the low-tide line and can be reached by boat, float plane, or helicopter. This area was withdrawn from mineral entry in 1971 by the Alaska Native Claims Settlement Act for selection by Sealaska and Kake Tribal corporations (the area's Native regional and village corporations) and is currently listed as interim conveyed, pending patent. These entities must be contacted prior to accessing their land holdings.

History

Uranium anomalies were first reported in the area by Eakins (1975) during an investigation of uranium locations in Southeast Alaska. His work included reconnaissance mapping, geochemical sampling, and a ground-based radiometric survey of approximately 5 miles of beach–from the mouth of Kadake Bay, south along the west side of Port Camden. In addition, Dickinson (1979) collected a series of samples that returned anomalous uranium values along the intertidal zone at the north end of the peninsula.

Mineral Assessment

The rocks in the Kadake Bay area have been described in detail by Wright and Wright (1908), Buddington and Chapin (1929), and Muffler (1967). They consist of nonmarine sandstone, conglomerate, and lesser shale of the Lower Tertiary Kootznahoo Formation (Muffler, 1967). These sediments are thought to have been deposited in lakes or shallow basins with some areas of marsh land (Wright and Wright, 1908). The Kadake Bay occurrence lies mostly within medium-grained, angular quartz arenite. Thin beds (1 to 4 inches thick) of black carbonaceous shale with plant fossils are found in the sandstone; these give scintillometer readings slightly above background values.

The BLM collected samples from different fossiliferous shale beds that yielded values up to 46 ppm uranium, 23 ppm lanthanum, and 41 ppm cerium (map no. 12.1, samples 174, 175; table B-3). These results, though anomalous, represent only a limited extent of the exposed rock.

Conclusions

Anomalous rare-earth values were obtained in both sandstone (Dickinson, 1979) and black carbonaceous shale from the Kadake Bay area. However, the values are well below those required for an economically viable deposit. Based on the BLM's investigation, there seems to be little potential here for a rare-earth resource.

KUIU 1-9

(Plate 1, Map no. 13)

MAS no.:	0021160003	*Quadrangle:*	Petersburg D6
Deposit Type:	Unknown: Au	*Latitude:*	56.6664
Land Status:	Open Federal	*Longitude:*	-133.2566
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate name:	Kuiu		

Location/Access

The Kuiu occurrence is on the east side of Kuiu Island, between Kadake Bay and Port Camden, 12 miles south of Kake. It can be reached by small boat, float plane, or helicopter at low tide. Boat access into Kadake Bay is limited to medium and high tides due to the large tidal flats exposed at low tide.

History

T.F. Schorn staked the Kuiu 1-9 claims for gold at this location in 1976. Mapco Inc. staked the Krista claims at the same location in 1979. The Krista block of 21 claims may have overlapped the Kuiu claims or may have been located adjacent to them. There is no record of exploration activity beyond the initial staking of both blocks (Alaska Kardex, 117-085). This area was also investigated for uranium by Eakins (1975) and Dickinson (1979).

Mineral Assessment

The Kuiu occurrence lies within a section of the Tertiary Kootznahoo Formation that has been intruded by Tertiary gabbro (Muffler, 1967). Nonmarine Kootznahoo sediments crop out just inside the tree line along the beach.

BLM personnel collected one pan concentrate and eight stream sediment samples from several very small streams along the northwest side of Port Camden. The pan concentrate sample was taken from fine-grained sand found in a wooden box lying just above the high-tide line. This sample contained 2,255 ppb gold (map no. 13.2, sample 170). Stream sediment samples contained up to 24 ppb gold and 37 to 130 ppm zinc (map nos. 13.1-13.3, samples 168-169, 171-173, and 9624-26).

Conclusions

Stream sediment samples from the numerous small creeks draining into the northwest side of Port Camden revealed low gold and base metal concentrations. The site is unlikely to attract future mineral exploration.

PORT MALMESBURY

(Plate 1, Map no. 14)

MAS no.:	0021160020	*Quadrangle:*	Port Alexander A1, B1
Deposit Type:	PV: Au, Zn, Cu, Pb	*Latitude:*	56.2400
Land Status:	Closed Federal	*Longitude:*	-134.2045
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

Port Malmesbury is a bay on the west side of Kuiu Island bordering Chatham Strait, approximately 50 miles south-southeast of Kake. Historic claims and mineral exploration activity were sited in four parts of Port Malmesbury, two near the shoreline and two inland. Access to the shoreline sites may be made by boat, float plane, or helicopter at low tide. The inland sites may be reached by walking from tidewater or most easily by helicopter. Port Malmesbury is within the Kuiu Island Wilderness area, so helicopter access is limited and mineral entry and development is precluded.

History

The first recorded mineral activity in the Port Malmesbury area was in 1926 with the staking of the Midas No. 1 Lode Claim by Carl Collen and George Stevens (Petersburg Recorder's Office, filed April 28, 1927). In 1953 Donald MacDonald, Roland Gildersleeve, and Dave Ohmer staked 38 claims in four locations in the Port Malmesbury area. No further work besides the staking was recorded on the claims. In 1958 S.H.P. Vevelstad staked the Marlborough Nos. 1-8 claims in the area, but again, no further assessment work was recorded (Alaska Kardex, 116-009).

The only published geologic reference to the Port Malmesbury mineralization was by Cobb (1967). The area was covered by the USGS mineral resources investigation of the Petersburg and parts of the Port Alexander and Sumdum quadrangles in the mid 1980's (Brew and others, 1984; Grybeck and others, 1984; Cathrall and others, 1983).

The Bureau of Mines examined samples from Port Malmesbury in 1954 and 1968 that were submitted by Donald MacDonald. The results of these examinations were never published, but are available from the BLM - Juneau office.

Mineral Assessment

The claims staked in the Port Malmesbury area in the early 1950's consist of four blocks (Alaska Kardex, 116-009). The blocks lie in rocks that have been mapped generally as sedimentary units within the Upper Silurian to Lower Ordovician Bay of Pillars Formation, which is thought to represent an island arc environment. Cretaceous intrusions of granodiorite to diorite are exposed across southern Kuiu Island and particularly in the Port Malmesbury area (Brew and others, 1984).

BLM personnel located one of the Port Malmesbury occurrences in the intertidal zone on the northwest side of the peninsula that juts into Port Malmesbury from the south. Thin quartz veinlets with sulfides cut silty limestone with intercalated mudstone/graywacke. The sediments are tightly folded with axes trending and plunging to the southeast. The veinlets are not folded. The veinlets are generally less than 1 inch thick, but may be up to 6 inches thick. They generally trend to the northeast and dip to the northwest. The veinlets are exposed between tidewater and vegetative cover on a small peninsula and also on the opposite side of the small peninsula, 250 feet to the northeast. So the extent of the exposure is approximately 50 feet by 250 feet, but the veinlets make up only about 1 percent of the rock volume across this area.

The veinlets are mostly made up of quartz with up to 20 to 30 percent sulfides. The sulfides include pyrite, sphalerite, and chalcopyrite. Analytical results indicate zinc values up to 7.8 to 10.2 percent, with minor copper, silver, and gold (map no. 14.2, samples 3838, 8754-56). One sample from this set contained 541 ppm bismuth (map no. 14.2, sample 8755), the second highest bismuth value detected in the over 1,700 samples collected during the Stikine study.

South of the occurrence described above the carbonaceous country rock locally contains fine-grained, disseminated pyrite, and lenses and pods of pyrite and chalcopyrite. A sample across a thin sulfide lens contained 1,695 ppb gold and greater than 10,000 ppm arsenic (map no. 14.3, sample 3839).

BLM personnel searched for another one of the four Port Malmesbury occurrences at the head of the southern arm of Port Malmesbury. Although the occurrence was not located, the BLM sampled a piece of quartz float from the southwest-flowing drainage that enters the head of the arm. Analysis of the quartz with banded pyrite, arsenopyrite, and minor chalcopyrite returned 0.526 oz/t gold, greater than 10,000 ppm arsenic, and 392 ppm bismuth (map no. 14.8, sample 3847). Anomalous arsenic is also indicated in the area by USGS stream sediment samples (Cathrall and others, 1983).

Although the BLM did not locate all the historic occurrences in the Port Malmesbury area, descriptions of the mineralized rock from the area suggest that what the BLM was able to locate is probably representative of the mineralization in the area. A letter to Donald MacDonald reporting on the examination of rocks that he submitted to the Bureau of Mines for evaluation describes samples with pyrite, sphalerite, arsenopyrite, galena, and chalcopyrite in gangue of predominantly milky quartz, silicified limestone, and calcite (Herdlick, 1954; D. MacDonald, oral commun., 1998).

Conclusions

Mineralized rock is widespread in the Port Malmesbury area and high grade in some places, but there is not a sufficient quantity identified so far to encourage mineral development. The fact that BLM samples that were high in gold are associated with elevated arsenic and that USGS stream sediment samples from the area were found to be anomalous in arsenic (Cathrall and others, 1983) might suggest that additional investigations in the area are warranted. However, the wilderness land status of the area will likely preclude further investigation.

TABLE BAY

(Plate 1, Map no. 15)

MAS no.:	0021160070	*Quadrangle:*	Port Alexander A1
Deposit Type:	Skarn: W	*Latitude:*	56.1344
Land Status:	Open Federal	*Longitude:*	-134.2522
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

Table Bay is on the southern end of Kuiu Island, on the west side. It is approximately 70 miles southwest of Petersburg. The occurrence is exposed along the rocky shoreline on the south side of the bay (photo 6). Table Bay is accessible by boat; the shoreline occurrence is accessible by helicopter.

Photo 6. Rocky shoreline on the south side of Table Bay. Photo by P. Bittenbender.

History

There are no known documented mineral occurrences in the Table Bay area. BLM personnel were attracted to the area by the presence of anomalous USGS stream sediment and rock samples (Cathrall and others, 1983; Karl and Koch, 1990). Brew and others (1989) include Table Bay in a "mineral resource tract" that suggests the potential for polymetallic vein deposits.

Mineral Assessment

BLM personnel were investigating the Table Bay area to locate the source of anomalous arsenic in a USGS stream sediment sample. Arsenic is associated with mineralization elsewhere on southern Kuiu Island, specifically at Port Malmesbury (map no. 14) and Point St. Albans (map no. 17). Stream sediment and pan concentrate samples collected by the USGS about a mile south of the Table Bay occurrence were also anomalous in tungsten and had slightly elevated levels of copper, zinc, and lead. In addition, the USGS detected scheelite in the nonmagnetic fraction of a heavy mineral concentrate from the sample (Cathrall and others, 1983). Karl and Koch (1990) also reported anomalous copper and molybdenum in a rock chip sample from the area.

The rocks in the Table Bay area have been mapped generally as sedimentary units of the Upper Silurian to Lower Ordovician Bay of Pillars Formation. Locally, this unit includes graywacke, mudstone, calcareous mudstone, and limestone. Cretaceous intrusions of granodiorite to diorite are exposed across southern Kuiu Island and one such intrusion crops out on the south side of Table Bay (Brew and others, 1984).

The Table Bay occurrence consists of sulfide-bearing skarn in the thermal aureole of a small intrusive body that crops out on the south side of Table Bay. Brew and others (1989) describe the intrusive as a mid-Cretaceous granodiorite. It is medium- to coarse-grained and speckled black and white, with biotite, hornblende, quartz, and plagioclase. It intrudes a sequence of graywacke interbedded with siliceous mudstone and thinly bedded limestone. The host rock is cut by veinlets of quartz and calcite, which commonly have associated knots of pyrrhotite and pyrite plus minor chalcopyrite. Within the thermal aureole, skarn has developed, which consists mainly of massive garnet with quartz and epidote. Pods of sulfide-rich rock are sporadic within the skarn zone, which extends for approximately 200 feet by 500 feet across the shoreline. The sulfides make up less than one percent of the rock volume in the skarn zone.

BLM investigators collected four samples in the Table Bay area. One sample across a 0.6-foot pod of sulfide in skarn contained greater than 2,000 ppm tungsten, the highest value in tungsten from over 1,700 samples collected by the BLM during the Stikine mineral assessment study (map no. 15.1, sample 8758). This sample also contained 3,082 ppm copper. Other samples from the area had up to 1,310 ppm copper (map no. 15.1, sample 3849) and 112 ppm molybdenum (map no. 15.2, sample 3851).

Conclusions

The Table Bay occurrence by itself is of little significance; however, its existence extends the area over which mineralized rock is found associated with the Cretaceous intrusions on southern Kuiu Island. It also indicates the potential for skarn deposits in the area in addition to the polymetallic veins at the other occurrences on southern Kuiu Island.

KELL BAY

(Plate 1, Map no. 16)

MAS no.:	0021160066	*Quadrangle:*	Port Alexander A1
Deposit Type:	PV: Au, Ag, Pb, Cu	*Latitude:*	56.7982
Land Status:	Open Federal	*Longitude:*	-133.9435
Development:	None	*MDP:*	Low
BLM work:	Mapped, Sampled	*MEP:*	Low

Location/Access

The Kell Bay prospect is on southern Kuiu Island, at an elevation of 450 feet. On the southwest side of a saddle, it lies almost a mile south-southeast of the head of the southern arm of Kell Bay. The showing is at the foot of an 15-foot-high waterfall (photo 7). BLM personnel accessed the occurrence by foot from the southern arm of Kell Bay, which may be accessed by boat or float plane. Access by helicopter to the saddle a quarter of a mile to the northeast is also possible.

Photo 7. Sampling a mineralized shear at the base of a 15-foot waterfall, Kell Bay prospect. Photo by P. Bittenbender.

History

Little is known about the Kell Bay prospect. The sole published reference is by Roehm in 1942, who was reportedly told of it by I.M. Hofstad. Roehm visited the prospect and collected one sample. His description and sample results are presented in a report of his itinerary of mining investigations (Roehm, 1942).

Mineral Assessment

The rocks in the Kell Bay area have been mapped generally as sedimentary units within the Upper Silurian to Lower Ordovician Bay of Pillars Formation, which is thought to represent an island arc environment. Cretaceous intrusions of granodiorite to diorite are exposed across southern Kuiu Island, and one exposure is mapped less than a quarter of a mile east of the Kell Bay prospect (Brew and others, 1984).

The Kell Bay occurrence consists of a mineralized shear zone hosted in banded limestone and silty limestone with interbedded chert (fig. 6). Bedding generally strikes to the northwest and dips steeply to the southwest. The limestone has been tightly folded and multiply deformed. Primary folds have been refolded with the secondary fold axes oriented approximately 010°.

The mineralized shear zone is oriented parallel to bedding, approximately 300°, but has a vertical to steep northeast dip. The bedding dips steeply to the southwest. Quartz in the shear is variably mineralized with knots, bands, and disseminations of pyrite plus minor sphalerite and galena. In places the quartz is crystalline and exhibits open-space-filling.

Bureau personnel mapped the Kell Bay exposure and collected four measured samples of quartz with sulfides and mineralized limestone. The highest-grade samples were 134 ppb gold, 2,959 ppm zinc, and 1,264 ppm arsenic over 1.3 feet (map no. 16.1, sample 3870) and 15 ppm silver and 335 ppm lead over 0.7 feet (map no. 16.3, sample 3867). A select sample of quartz with sulfides contained 25.2 ppm silver, 1,153 ppm copper, 8,692 ppm lead, and 14,558 ppm zinc (map no. 16.5, sample 3871). These select sample results are on the order of those obtained by Roehm (1942).

Conclusions

The mineralized rock at the Kell Bay prospect is similar to that at other occurrences on southern Kuiu Island, i.e., Port Malmesbury and Point Saint Albans. Although the sulfide phases and host rocks vary at the occurrences, silicified shears concentrate sulfides and seem to be spatially related to Cretaceous intrusives. So even though the Kell Bay occurrence itself is of little significance, its presence broadens the known extent of similar mineralized rock across southern Kuiu Island.

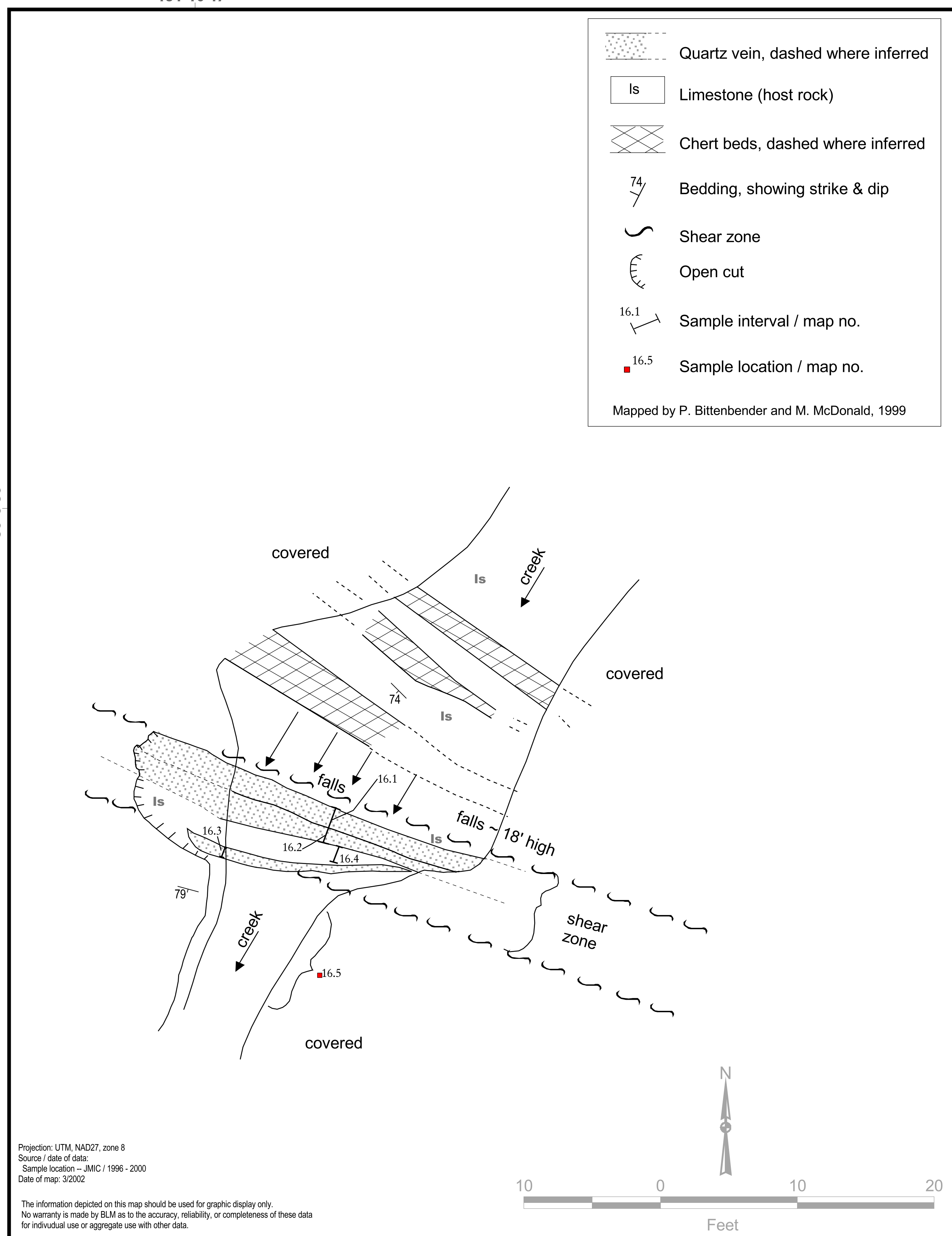


Figure 6. Map of the Kell Bay prospect.

Point Saint Albans

(Plate 1, Map no. 17)

MAS no.:	0021170022	*Quadrangle:*	Port Alexander, A1
Deposit Type:	PV: Au, Ag, Pb, Zn	*Latitude:*	56.1088
Land Status:	Open Federal	*Longitude:*	-133.9577
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Point Saint Albans occurrence is 1.5 miles north of Point Saint Albans on the southeast tip of Kuiu Island, 60 miles south of Kake. Access is by boat or helicopter at low tide.

History

The earliest recorded activity at the Point Saint Albans occurrence is credited to Fred Magill sometime prior to 1952. At that time, J.R. Houston visited Magill's zinc property to evaluate it for uranium potential (Houston and others, 1958). Claim records for Magill's Hot Spot claim appear in 1954 (Alaska Kardex, 117-010), but there is no record of subsequent activity. USGS investigators examined the property and collected samples during their Alaska Mineral Resource Assessment Program of the Petersburg and parts of the Port Alexander and Sumdum quadrangles (Grybeck and others, 1984).

Mineral Assessment

The sedimentary rocks in the vicinity of the Point Saint Albans occurrence are part of the Upper Silurian to Lower Ordovician Bay of Pillars Formation (Brew and others, 1984). Locally these generally fine-grained, medium-bedded mudstones have been intruded by Cretaceous hornblende diorite (Brew and others, 1984), hornfelsed, cut by basaltic dikes, and sheared. Bedding, defined by inch-scale limestone layers in the mudstone, strikes approximately 340° and dips approximately 30° to the northeast.

The Point Saint Albans occurrence consists of shear zones containing disseminations, stringers, and lenses of sulfide minerals and small, sulfide-rich veins along dike margins. The mineralized rock is exposed along approximately 2,500 feet of shoreline, in an intertidal bench approximately 50-foot wide. The shear zones are typically iron-stained, contain irregular quartz-calcite veins and lenses or breccias cemented by quartz and calcite, and range in width from less than 1 to approximately 10 feet. They generally strike west to northwest and dip shallowly to steeply to the southwest, although some shears strike to the northeast and dip to the southeast. The mineralization is characterized by coarse-grained, disseminated sphalerite; very fine grained, disseminated galena; very fine grained, disseminated arsenopyrite; and fine- to coarse-grained, disseminated to massive pyrite and pyrrhotite. Grybeck and others (1984) also report berthierite ($FeSb_2S_4$) associated with the quart-calcite veins and lenses. The sulfides commonly, although not exclusively, are found in the quartz-rich parts of the shear zones.

BLM personnel collected 16 samples from different mineralized outcrops at the Point Saint Albans occurrence (Appendix Table B-1). Analytical results indicate spotty, high-grade values over relatively narrow intercepts. Two samples were particularly high in gold, sample 8767 (map no. 16.1) with 5,839 ppb gold and sample 9628 (map no. 17.2) with 5,535 ppb gold. These samples were collected the farthest to the north along the mineralized intertidal zone and apparently the closest to the dioritic intrusion. Each of the samples is also associated with high arsenic values and relatively high silver.

Four of the BLM's sixteen samples had very high silver values: sample 9631 (map no. 17.3) with 342 ppm silver, sample 180 with 162 ppm silver, sample 3859 with 151 ppm silver, and sample 8767 with 126 ppm silver. These samples also contained the highest lead values, with up to 8.15 percent lead (map no. 17.3, sample 9631), as well as elevated levels of zinc, mercury, arsenic, and antimony.

Ten of the sixteen samples contained zinc values that ranged from 2,186 ppm to 9.9 percent zinc (map nos. 17.1-17.5, samples 177, 179-180, 3859, 3863, 8767, 9628-31). The BLM collected most of these samples across relatively narrow exposures. The largest interval was 9.0 feet with 2,971 ppm zinc (map no., 17.3, sample 3863) and the highest grade of 9.9 percent zinc was from a grab sample of float (map no. 17.3, sample 3859).

BLM personnel collected samples from a variety of mineralized rock types. A sample from a 1-inch-wide band of pyrite, arsenopyrite, and sphalerite found along the margins of a hornblende diorite dike contained 5,535 ppb gold and 8,409 ppm zinc (map no. 17.2, sample 9628). A sheared, sedimentary breccia with galena, sphalerite, and arsenopyrite contained 342.2 ppm silver, 8.15 percent lead, and 1.1 percent zinc across 0.4 feet (map no. 17.3, sample 9631). A sample of a quartz vein containing galena, sphalerite, pyrite, and arsenopyrite returned 161.7 ppm silver, 9,834 ppm lead, and 2.4 percent zinc across 0.4 feet (map no. 17.3, sample 180). A lens of massive pyrrhotite and pyrite with interstitial quartz 4 feet long and 0.5 feet wide contained low precious and base metals, but had the highest copper value from the area at 3,094 ppm copper (map no.17.3 sample 3862).

Conclusions

Samples from the Point Saint Albans occurrence contained high concentrations of silver, zinc, and lead. Two samples contained high concentrations of gold. These samples also contained anomalous amounts of mercury, arsenic, and antimony. Although precious and base metal concentrations are elevated, samples were collected from scattered, narrow zones across a relatively wide area along the shoreline. The zones are too narrow and widespread to make a large, low-grade deposit, but their large aerial extent and high grade encourages further exploration. Mineralized rock at Point Saint Albans is concentrated in shear zones and seems to be spatially associated with Cretaceous intrusions. This similarity of mineralization with the occurrences at Port Malmesbury and Kell Bay suggests a broad mineralizing system on the south end of Kuiu Island.

CORONATION ISLAND

Property name	Plate 1, Map no.
Coronation Island	18
Alikula Bay	19

CORONATION ISLAND

(Plate 1, Map no. 18)

MAS no.:	0021190036	*Quadrangle:*	Craig D7
Deposit Type:	PR: Au, Ag, Pb, Zn	*Latitude:*	56.4526
Land Status:	Closed Federal	*Longitude:*	-131.2372
Development:	3 adits, cut, trenches	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Coronation Island prospect is on the west side of Egg Harbor, on the north end of Coronation Island, 85 miles southwest of Wrangell. The prospect workings are situated between elevations of 800 and 1,100 feet on the steep eastern slopes of Pin Peak on the west side of the harbor. All of Coronation Island has been designated as a wilderness area and so is closed to mineral entry. Access to Egg Harbor is easiest by boat, although float plane access may be possible under favorable weather conditions. From tidewater, access to the workings is by foot– either by hiking on a historic trail that is still discernable or by following a pair of aerial tram cables that lie on the steep slopes. Due to the wilderness status of the island, helicopter access is prohibited without specific permission from the Forest Service.

History

Silver-bearing galena in limestone was discovered at Coronation Island in 1900. By 1902 the Coronation Mining Co. had formed and begun exploring the occurrence (Wright and Wright, 1908). By 1903 ore shipments began (Roehm, 1940), and by 1908 over 100 tons of ore had been shipped to the smelter (Wright and Wright, 1908). There is no known record of additional production.

Historic workings at Coronation Island include three adits and at least one pit. Three previous reports describe the adits and give different names and elevations for each–Wright and Wright, (1908); Roehm, (1940); and Twenhofel and others, (1949). The Wrights and Twenhofel and others call the upper adit (980 feet or 1,020 feet elevation) number 1, the middle adit (860 feet or 900 feet elevation) number 2, and the lower adit (700 feet elevation) number 3. Roehm (1940) names the adits differently, but the former convention will be used here.

The numbers 1 and 2 adits were mapped by Twenhofel and others (1949), but the number 3 adit was reportedly not found (Twenhofel and others, 1949). During Roehm's examination of Coronation Island, he reported the upper (number 1) adit as being caved (Roehm, 1940), although the same adit was mapped several years later by Twenhofel and others (1949). On the other hand, the number 3 adit reportedly not found by Twenhofel and others (1949) is described as 71 feet long by Roehm (1940).

It is uncertain how long mining activity continued on Coronation Island. By 1915 the site was reported as idle (Chapin, 1916) and described as abandoned by 1940 (Roehm, 1940).

In 1971 and 1972 George Moerlein staked a block of 116 claims, called the Judy claims, that covered the Coronation Island occurrence and extended to the south. In late 1972, he optioned the claims to Phelps Dodge Corporation. Phelps Dodge held the claims at least through 1973 (Alaska Kardex, 119-150). Results of the work done by Phelps Dodge at the property have not been made public.

Mineral Assessment

Silurian Heceta Limestone underlies the northwest end of Coronation Island in the vicinity of the occurrence. An undated, probably Mesozoic, intermediate composition intrusive crops out at least one mile southeast of the occurrence (Eberlein and others, 1983). Roehm (1940) reports "greenstone" dikes in the immediate vicinity, but he does not believe there is a genetic relationship between the intrusives and the mineralization.

The occurrence consists of irregular to lenticular pods or masses of galena that have apparently replaced limestone, or filled fissures in limestone, along faults and shear zones (Twenhofel and others, 1949; Roehm, 1940). Most of the mineralized rock has been mined from the workings. Twenhofel and others (1949) state that additional galena bodies are likely present along the faults in the area, but that it would probably be uneconomical to try to mine them.

The BLM investigation of Coronation Island was confined to locating the workings and collecting samples. BLM investigators found two adits, numbers 1 and 2, in poor condition and one pit. Adit number 3, or the lower adit, was not located. The maps of the adits by Twenhofel and others (1949) were found to be relatively accurate. BLM personnel collected grab samples from rubble in the adit stopes and a sample from the pit.

In adit number 1, BLM personnel found two parallel faults approximately three feet apart that enclose a breccia zone of iron-stained limestone and coarsely crystalline calcite in fine-grained, buff to gray limestone. A stope on the breccia zone suggests this was once a target of the miners. Samples from rubble below the stope returned up to 674 ppb gold, 11.5 ppm silver, 1,045 ppm lead, and 3,333 ppm zinc (map no. 18.2 , samples 3852, 8759).

From a crosscut near the face of adit number 2, BLM personnel collected a sample of coarsely crystalline calcite with interstitial crystalline galena and abundant limonite. Analytical results from the sample indicated 27 ppb gold, 75 ppm silver, 1.95 percent lead, and 4.3 percent zinc (map no. 18.1, sample 3856). Two other samples from the adit of iron-stained fault gouge (sample 3854) and iron-stained limestone breccia with calcite veins (map no. 18.1, sample 3855) returned much lower base and precious metal values. A single sample collected from the pit, between adits 1 and 2, contained 13.2 ppm mercury, and 6,544 ppm zinc, but was relatively low in other metals (map no. 18.1 , sample 3853).

The highest-grade sample collected from the Coronation Island occurrence consisted of weathered gossan with knots of galena from below the number 2 adit. This sample contained 13.95 ppm gold, 682 ppm silver, greater than 1 percent lead, 3.58 percent zinc, greater than 1 percent arsenic, 39.3 ppm mercury, and 307 ppm tin (map no. 18.1, sample 8760).

Conclusions

Although some of the samples collected by the BLM returned interesting values, samples of the more common mineralized rock exposed in the area contained relatively low metal values. It appears that most of the high-grade rock has been mined from the surface showings and workings on the occurrence. Twenhofel and others (1949) suggest that more mineralized rock could probably be found in the area, but that it would probably be uneconomical to extract. The occurrence of mineralized rock at Coronation Island is irregular, which along with the relatively low metal values would discourage exploration of the prospect. In addition, the wilderness status of the island precludes mineral exploration and development.

ALIKULA BAY

(Figure 7, Map no. 19)

MAS no.:	0021190335	*Quadrangle:*	Craig D7
Deposit Type:	PR: Au, Ag, Pb, Zn, Cu	*Latitude:*	55.9183
Land Status:	Closed Federal	*Longitude:*	-134.2959
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

Alikula Bay is on the northwest end of Coronation Island, 83 miles southwest of Wrangell. The showing is on a tidal bench, just above high-tide line, at the foot of the shoreline cliffs on the east side of the bay near its mouth. All of Coronation Island has been designated as a wilderness area and so is closed to mineral entry. Access to Alikula Bay is easiest by boat, although float plane access may be possible under favorable weather conditions. Due to the wilderness status of the island, helicopter access is prohibited without specific permission from the Forest Service.

History

Roehm (1942; 1943) is the only one known to have published an account of a mineral occurrence in Alikula Bay. He gives no history other than to say that the showing was reported to him by I.M. Hofstad.

Mineral Assessment

The northern part of Coronation Island in the vicinity of Alikula Bay is underlain by Silurian Heceta limestone. It has been intruded by an undated, probably Mesozoic, intermediate composition intrusive (Eberlein and others, 1983) that crops out within hundreds of feet of the occurrence. Roehm (1942) also reports various phases of intrusive activity near the occurrence from "greenstone lava" to "acid dikes."

Photo 8. Massive sulfide lenses hosted in limestone at Alikula Bay. Each investigator is standing on a massive sulfide lens. Photo by P. Bittenbender.

BLM personnel found several large irregular masses of massive sulfide hosted in limestone at Alikula Bay (photo 8; fig. 7). The hosting limestone varies across the occurrence, but generally is buff-colored, medium-grained, and sugary-textured. The sugary-textured carbonate may be more metamorphosed. BLM personnel did not find the intersecting fractures described by Roehm (1942) that he thought concentrated the mineralization. Only a single fracture, oriented similarly to one described by Roehm, was found.

Roehm (1942) described several dikes in the immediate vicinity of the mineral occurrence. BLM personnel noted two, 1- to 2-foot mafic dikes north of the sulfide masses, and a 50-foot-wide mafic dike 100 to 150 feet to the south. The large mafic dike is dark green, coarse-grained and amphibole-rich, with magnetite and minor pyrite. There is no obvious genetic relationship between the dike and the mineralized rock. BLM investigators did not find any dikes in the immediate vicinity of the sulfide masses and no skarn minerals were found. The orientation of the 50-foot dike was difficult to determine because its contacts are not exposed, but Roehm (1942) describes a northwest strike and southwest dip for a 50-foot dike south of the occurrence.

The sulfide masses at Alikula Bay are composed of approximately 80 percent coarsely crystalline pyrite with pyrrhotite and sphalerite. In places, anhedral crystals of sphalerite are up to an inch across. Analytical results indicate the likely presence of minor chalcopyrite, galena, stibnite, and arsenopyrite. The masses are in sharp contact with the hosting limestone, but the contacts are scalloped. In places, veinlets of sulfide cut the limestone adjacent to the sulfide mass. Where the sulfides have been exposed on the surface, oxidation has occurred forming abundant gossan.

The largest exposed mass of sulfide measures 28 feet by 10 feet on the surface. Two other masses are also exposed nearby (fig. 7). Samples across the masses returned up to 3,347 ppb gold, 15.9 ppm silver, 1,202 ppm copper, 2,556 lead, and 6,630 ppm zinc across 20 feet of the largest sulfide mass (map no. 19.3, sample 8762). One of the highest-grade samples assayed 8,483 ppb gold, 22.5 ppm silver, 1,173 ppm copper, 7,515 ppm lead, and 4.89 percent zinc across 8 feet (map no. 19.5, sample 8763). Of the seven samples collected from the Alikula Bay occurrence, six had gold values over 1,200 ppb; all had silver values over 10 ppm; all had lead values over 2,500 ppm, with one sample over 1 percent lead (map no. 19.4, sample 8765); four of the seven samples had over 1.4 percent zinc, with one sample at 8.69 percent zinc (map no. 19.4, sample 8765); and all had bismuth values over 40 ppm, with one sample at 336 ppm bismuth (map no. 19.7, sample 3858). All of the Alikula Bay samples were high in arsenic, antimony, and mercury as well.

Conclusions

The samples collected by the BLM from Alikula Bay indicate high base metal grades along with elevated precious metals. However, the irregular nature of the replacement deposit suggests any additional mineralized rock at the site would also be irregular and, therefore, difficult to define and extract. In addition, the wilderness status of the area precludes ground-disturbing, mineral exploration activity.

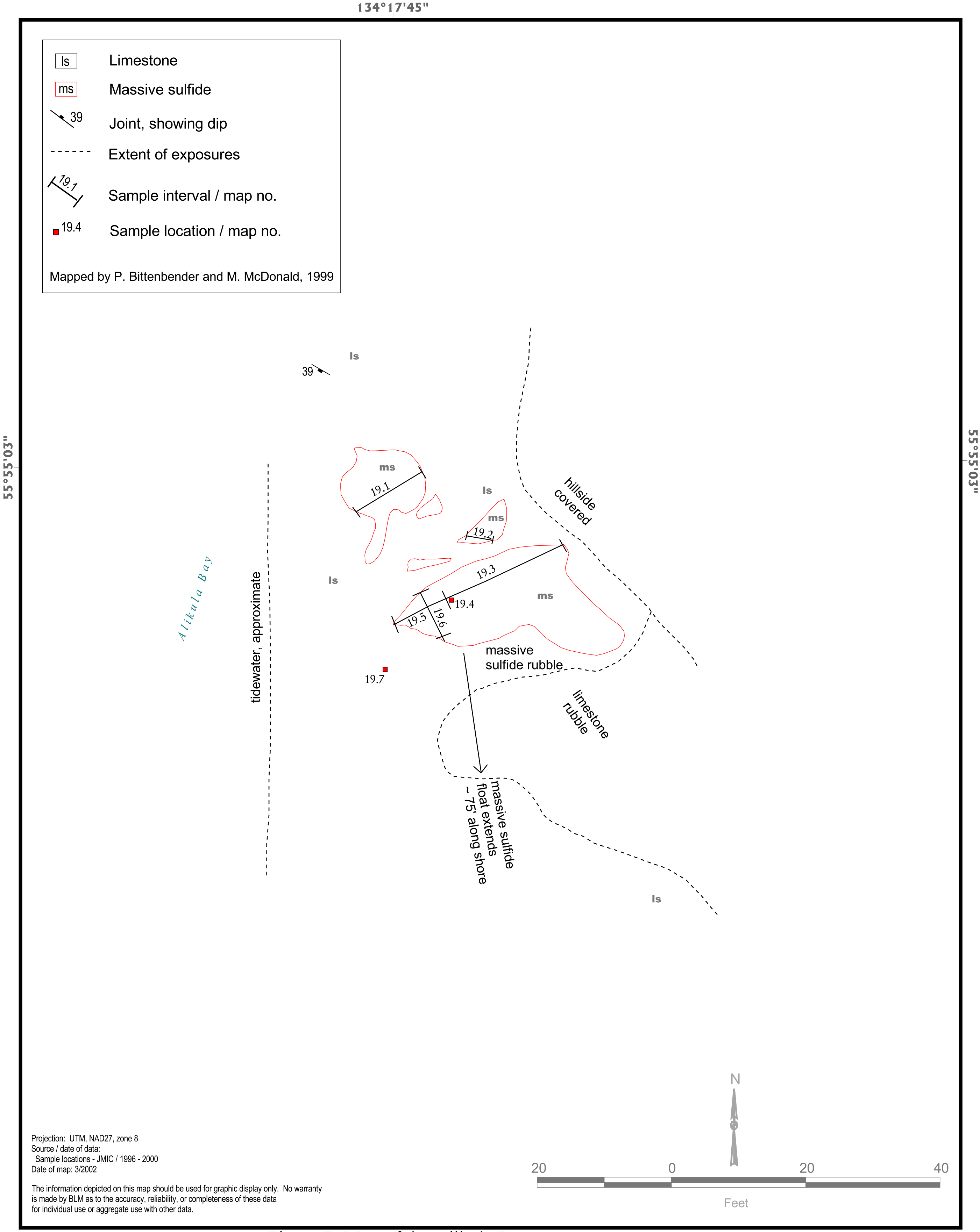


Figure 7. Map of the Alikula Bay occurrence.

KUPREANOF ISLAND

PINTA POINT

(Plate 1, Map no. 20)

MAS no.:	0021150071	*Quadrangle:*	Sumdum A6
Deposit: Type:	VMS: Au, Cu, Zn	*Latitude:*	57.0981
Land Status:	Native	*Longitude:*	-133.8839
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

Pinta Point is at the northernmost tip of Kupreanof Island, 9 miles north-northeast of Kake. The occurrence at Pinta Point is exposed along the shoreline, in the intertidal zone and above the high-tide line. The area is accessible by boat and by helicopter. Land in the area is controlled by Kake Tribal and Sealaska corporations (the area's Alaska Native Claims Settlement Act [ANCSA] Native village and regional corporations). These entities must be contacted prior to accessing their land holdings.

History

BLM personnel discovered anomalous mineral concentrations during a reconnaissance investigation along the north shore of Kupreanof Island. No mention of this prospect is known in published literature.

Mineral Assessment

The occurrence at Pinta Point is hosted in graphitic schist that is part of a unit mapped as metamorphosed, Upper Mesozoic, Stephens Passage Group (Brew and others, 1984). Near Pinta Point, the unit includes interlayered limestone, chert, felsic schist, and greenstone. The rocks are metamorphosed and have been repeatedly deformed.

The host graphitic schist is commonly siliceous, dark gray, and well foliated. It has been penetratively and repeatedly deformed with tight to isoclinal folds, commonly on a scale of inches to a few feet. Foliation in the area trends generally northwest with steep dips. Near Pinta Point, the schist includes finely disseminated and massive sulfides, mainly pyrite and pyrrhotite, that can be found along approximately 500 feet of the shoreline. In places the sulfides make up 30 percent or more of the rock as layers up to 1 foot thick. One 15-foot-wide zone contains approximately 10 percent sulfides across its entire width. This zone is exposed for approximately 30 feet, between the boulder-strewn shoreline and brush inland. In another area, the graphitic schist with seams of pyrite is exposed in cliffs above the intertidal zone. Here the rock is poorly indurated, and its appearance is slaty. The sulfides at Pinta Point are mainly pyrite and pyrrhotite with small amounts of sphalerite and chalcopyrite.

BLM personnel sampled the mineralized rock; two samples were collected from the 15-foot-wide zone and one from the poorly indurated rock described above. Sample results indicate low precious and base metal values (map no. 20.1, samples 2363, 2364, 2391). A representative sample across 11 feet of the 15-foot-wide zone contained 43 ppb gold, 143 ppm copper, and 624 ppm zinc (map no. 20.1, sample 2363). A reconnaissance sample collected 1,000 feet west of Pinta Point from an isolated 1.5- by 2-foot lens of massive sulfide contained 661 ppm copper and 1,595 ppm zinc (pl. 2, map no. R28, sample 2365).

Conclusions

Sample results indicate very low precious and base metal values associated with the sulfides at Pinta Point; however, the broad extent of mineralized rock might encourage further investigation of the area. In addition, the area lies within a belt of rocks that elsewhere hosts prospective VMS deposits. These attributes may generate future exploration interest in the area.

KAKE AREA ROAD SYSTEM

(Plate 1, Map no. 21)

MAS no.:	0021170200	*Quadrangle:*	Petersburg D6, Sumdum A6
Deposit Type:	VMS: Ag, Pb, Zn, Ba	*Latitude:*	56.9796
Land Status:	Native, Open Federal	*Longitude:*	-133.1140
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The small village of Kake (population 700) on northwestern Kupreanof Island is accessible by scheduled air service and by Alaska Marine Highway System ferry. The Kake Area Road System refers to the network of logging roads surrounding the village. The system includes the roads generally north of Kake belonging to the Kake Village Corporation (the area's Alaska Native Claims Settlement Act [ANCSA] Native village corporation), as well as those east and southeast of Kake on Forest Service land. Many of the logging roads are still accessible by truck. However, some are overgrown with alders and are impassible. Still others are washed out or the bridges have been removed. Consequently, much of the area is only accessible by foot. The occurrences discussed below are all situated on Native land holdings.

History

Only one group of claims is noted in the area here defined as the Kake Area Road System. The group, on Gunnuk Creek, is located on Native Corporation land approximately 3 miles northeast of Kake. Four claims were staked in the area in 1968 that reportedly targeted lode gold (Alaska Kardex, 117-074; Petersburg Recording Office, Mines Book 4, p. 67-68). No production is known to have taken place on the property (see Gunnuk Creek, Map nos. 22.1-22.3).

BLM personnel discovered three anomalous mineral concentrations during reconnaissance of the Kake road system in 1998. There is no known mention of these in published literature.

Mineral Assessment

The Kake road system area is made up mainly of Mississippian and Devonian argillite and graywacke of the Cannery Formation and Mesozoic phyllite and slate of the "Duncan Canal/Zarembo Island/Screen Island" sub-belt of Brew and others (1984). Cretaceous hornblendite and hornblende gabbro crop out at Turn Mountain, and several units of the Triassic Hyd Group are exposed west of there (Brew and others, 1984). All of these units are within the Alexander terrane (Silberling and others, 1994). Rocks in the area are unmetamorphosed or metamorphosed only to prehnite-pumpellyite or lower greenschist facies (Dusel-Bacon and others, 1996). Structures in the area trend generally to the northwest.

BLM personnel examined numerous rock pits along the Kake logging road system, particularly those of Kake Tribal Logging to the north of town. They also collected many reconnaissance samples from the pits (pl. 2), mostly of pyrite seams and segregations hosted in the argillite of the Cannery Formation. Three occurrences of note were discovered during the logging road examination: one consists of narrow sulfide veins; another, a lens or layer of massive barite; and the third, a shear hosting a layer of pyrite with chalcopyrite.

One mile northwest of Kake, two to three veins of sulfide minerals hosted in silicious argillite with calcite gangue are exposed in a rock pit. The veins average about 1 inch thick and extend for approximately 20 feet, where they are cut off by a fault in one direction and by cover in the other. Coarse, crystalline calcite is common adjacent to and within the sulfide veins as well as in veinlets in the silicious argillite. A representative sample of the sulfide-rich veins contained 1,135 ppb gold, 30.5 ppm silver, 7,327 ppm copper, and 5.4 percent zinc (map no. 20.3, sample 3700).

About 3 miles southwest of Turn Mountain, BLM personnel sampled a lens of massive barite that also contains galena and sphalerite. The lens, 2 feet thick and 6 feet long, is exposed in unconsolidated soil above a logging road, so its relation to the country rock in the area is unknown. The country rock is mapped as Cannery Formation (Brew and others, 1984) and consists mainly of argillite. Clasts of argillite are common in the massive barite of the lens. A select sample of the lens contained 13.1 ppm silver, 1.02 percent lead, 3.0 percent zinc, and 48.37 percent barium (map no. 21.2, sample 3705).

A small shear zone filled with quartz, potassium feldspar, epidote, and layers of pyrite and chalcopyrite was discovered approximately 1 mile south-southeast of Turn Mountain. The northeast- trending shear cuts hornblende diorite and is exposed in a rock pit. A layer of coarsely crystalline, weathered pyrite 1 to 3 inches thick with lenses of chalcopyrite is exposed for 15 feet in a wall of the pit. A select high-grade sample of the sulfides contained 30.6 ppm silver, 11.2 percent copper, and 1,253 ppm molybdenum (map no. 21.1, sample 3711).

Conclusions

The mineralized rock found by BLM investigators along the Kake Area Road System is of limited extent and unlikely to attract mineral exploration interest. The sulfide vein near Kake, though high grade, is too small to be considered of exploration interest. Additional follow-up work in the area may reveal the presence of other mineral concentrations, but a precious metal resource hosted in small veins is unlikely. The massive barite occurrence is worthy of additional investigation because barite is associated with other volcanogenic massive sulfide deposits in the area. Finding additional barite and examining its relationship to the surrounding country rock would be beneficial. This is likely to occur only if exploration interest is generated in the area by another more prospective target. The shear hosting pyrite and chalcopyrite is very limited in extent. Additional exploration of the occurrence is unlikely.

GUNNUK CREEK

(Plate 1, Map no. 22)

MAS no.:	0021170034	*Quadrangle:*	Petersburg D6
Deposit Type:	Unknown	*Latitude:*	56.5645
Land Status:	Native	*Longitude:*	-133.0595
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Gunnuk Creek prospect is approximately 3 miles northeast of Kake along Gunnuk Creek, which flows into Keku Strait at Kake. At this location, the creek flows gently within relatively subdued topographical relief. The area is accessible from the Kake road system; one of the Kake logging roads crosses Gunnuk Creek just below the prospect. The land in the area is controlled by Kake Tribal and Sealaska corporations (the area's Alaska Native Claims Settlement Act [ANCSA] Native village and regional corporations). These entities must by contacted prior to accessing their land holdings.

History

Very little is known about the claims. They were originally staked in 1968 as the "ABC" claims in a 4-claim block. The target was apparently lode gold (Alaska Kardex, 117-074).

Mineral Assessment

BLM personnel searched the Gunnuk Creek area where the prospect is reported to have been located (Alaska Kardex, 117-074), but found no evidence of mineral activity. They collected five stream sediment samples from the area, but none of the samples revealed significant metal values (map nos. 22.1-22.3, samples 3728-30, 8688-89).

Conclusions

There is not enough information available about the Gunnuk Creek claims to assess their significance. However, the lack of information itself suggests that any historically evaluated occurrence in the area is probably of little importance.

RD8

(Plate 1, Map no. 23)

MAS no.:	0021170197	*Quadrangle:*	Peterburg D5
Deposit Type:	VMS: Zn, Pb	*Latitude:*	56.8366
Land Status:	Open Federal	*Longitude:*	-133.5609
Developmentt:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The RD8 area, as it is currently defined here, extends for approximately 5 miles north-south and 2½ miles east-west. It includes the areal extent of rock and geochemical samples collected by the BLM that are suggestive of a VMS style of mineralization. The area is near the headwaters of Big John Creek on the west side of Kupreanof Island, between Towers Arm and Big John Bay. It is approximately 17 miles southeast of Kake. The area is cut by Forest Service logging roads, which indicates the intensive development prescription under which land in the area is managed; it is open to mineral entry. Access is easy by road from Kake or by helicopter. The road distance from Kake is approximately 20 miles.

History

A conductive anomaly was delineated in the RD8 area by an airborne geophysical survey that was flown in 1997 (ADGGS and others, 1997) and by the contractor who analyzed the resultant geophysical data (Pritchard, 1997). Geochemical anomalies determined by the BLM's follow-up of the airborne geophysical survey (Bittenbender and others, 2001) and geological investigations during the current study have defined the RD8 area as a mineral occurrence. There is no other known reference to the area in published literature.

Mineral Assessment

The RD8 area has been mapped as Permian and Mississippian Cannery Formation of chert, cherty argillite, silicified limestone, and siltstone and graywacke turbidites, with minor conglomerate, tuff, and volcanic rocks. Triassic sedimentary and volcanic rocks of the Hyd Group bound the area, predominantly to the east and northeast, but also to the west and south. A broad exposure of Quaternary and Tertiary volcanic and intrusive rocks borders the area generally to the west and southwest (Karl and others, 1999).

The authors of this report consider the RD8 area an occurrence based primarily on the extent and magnitude of the geochemical anomalies determined during the BLM's follow-up of the airborne geophysical survey. Stream sediment samples from the follow-up ran as high as 1,700 ppm zinc. The samples high in zinc were also anomalous in copper, molybdenum, and nickel. Additional samples from the area were anomalous in silver, lead, cadmium, manganese, mercury, arsenic, and antimony (Bittenbender and others, 2001). All of these elements are part of the geochemical signature of Triassic VMS deposits in southeastern Alaska (Taylor and others, 1995).

Although BLM investigators found some mineralized rock in the area, the source(s) of the distinct geochemical anomalies determined during the geophysical follow-up have not been found. Three showings in the area, however, suggest VMS styles of mineralization.

The first showing of potentially VMS-type mineralization is in a borrow pit from which road making material was extracted. Here, a 20-foot layer of silicified schist, chert, and graphitic schist is host to fine- to medium-grained pyrite commonly in seams and layers oriented parallel to schistose foliation, as well as in crosscutting seams and veinlets. The layer seems to have been altered primarily by silicification. The schistose layer is hosted in massive, hard, light to medium gray and greenish gray, fine- to medium-grained, granoblastic andesite. The andesite weathers maroon. Iron staining is common. Analytical results from samples collected in the pit indicate low precious and base metal values. The highest values from seven samples were 29 ppb gold, 0.9 ppm silver, 166 ppm copper, 920 ppm lead, and 1,075 ppm zinc (map no. 23.2, samples 3696, 3697, 8775, 8776, 8784-86). One sample contained elevated mercury (6.8 ppm; map no. 23.2, sample 8785).

About 0.75 miles to the west of this first pit is a second borrow pit in which seams and patches of fine-grained to crystalline pyrite are found in quartz veins and silicified parts of chloritic and carboniferous schist to slate. Analyses of samples indicate some of the quartz veins contain up to 105 ppb gold, 79 ppm cobalt, and 727 ppm arsenic (map no. 23.1, sample 3894). Additional analyses indicate low metal values in the hosting schist or slate.

A road cut, 2.7 miles southwest of the first pit, exposes mineralized rock similar to that found in the pit (photo 9). Argillite host rock in the road cut includes a layer at least 10 feet thick of silicified schist with layers of fine-grained pyrite, up to 2 inches thick, concordant with foliation in the schist (strikes 009° and dips 46° southeast). The pyrite also occurs as patches, wisps, and veinlets, particularly in the more silicified parts of the schist. Adjacent to the silicified parts of the outcrop, gossan and other oxidized rock is common. Analyses of samples from the road cut indicate anomalous zinc and barium concentrations. Sample 8787 contained 1,762 ppm zinc over 4 feet, and sample 3900 contained 9,176 ppm barium over 1.3 feet (map no. 23.12).

Photo 9. Road cut exposes VMS mineralization in the RD8 area. Photo by P. Bittenbender.

In addition to the samples described above, anomalous samples were collected from various other locations across the RD8 area. The highest gold value, 136 ppb gold, came from a grab sample from float of light green fuchsite schist with minor pyrite (map no. 23.7, sample 6425). A sample of slate with interbedded pyrite contained 1,740 ppm zinc and 486 ppm nickel (map no. 23.18, sample 3903).

Conclusions

Indications from geochemical sampling and sparse outcrops suggest the RD8 area is worthy of further mineral exploration. The results from stream sediment sampling by the BLM in their follow-up of the airborne geophysical survey indicate that the area is prospective for hosting a mineral occurrence. Geochemical anomalies from that study extend over an area approximately 2 miles north-south and one mile east-west. In addition, many of the anomalous values collected in the area were the highest of any collected across the Duncan Canal area (Bittenbender and others, 2001). The area is also attractive because it is located along a road network, is in an area of current resource development (timber), and is relatively unexplored.

TOWERS CREEK

(Plate 1, Map no. 24)

MAS no.:	0021170198	*Quadrangle:*	Petersburg D5
Deposit	VMS?: Cu?	*Latitude:*	56.8583
Land Status:	Open Federal	*Longitude:*	-133.4007
Development	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Towers Creek prospect is above a waterfall in Towers Creek, at an elevation of 140 feet. It is 1½ miles from the head of Towers Arm and 18 miles west-northwest of Petersburg. The topography of the area is gently sloping, with muskegs, dense brush, and thick timber stands. Short cliffs border the creek near the prospect, and access is most easily accomplished by helicopter. Investigators must land nearby and hike down a short cliff to the prospect in the creek.

History

In 1978 Amoco Minerals Co. staked a large block of claims covering the Towers Creek prospect at the north end of Duncan Canal. In 1978 and 1979 the company carried out airborne geophysical surveys; ground electromagnetic, magnetic, and gravity surveys; geologic mapping; soil and stream sediment geochemical sampling; and core drilling on their claims.

Mineral Assessment

The Towers Creek prospect is located in Devonian schists near the contact between Devonian schists and phyllites and Triassic Hyd Group argillite (Karl and others, 1999). The rocks trend west to northwest and dip 25° to the northeast.

The BLM's examination of this prospect revealed an outcrop/boulder in the middle of the creek that consists of iron-stained, calcareous, silicified schist containing disseminations and narrow bands of pyrite with sparse chalcopyrite. Six samples across the schist and pyrite bands contained from 175 to 713 ppm copper (map no. 24.1, samples 111-113, 270-272). Two stream sediment and three rock chip samples collected in Towers Creek, downstream from the prospect, did not contain significant metal values (map no. 24.2, samples 2345-47, 9558, 9559).

Conclusions

The BLM's examination of the Towers Creek prospect did not reveal significant mineralized rock.

NORTHERN COPPER

(Figures 8-12, Map no. 25)

MAS no.:	0021170011	*Quadrangle:*	Petersburg D5
Deposit Type:	PR/Skarn, VMS?: Cu, Zn	*Latitude:*	56.3454
Land Status:	Closed Federal	*Longitude:*	-132.3473
Development:	Adits, shaft, pits, 6 DDH	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Northern Copper prospect is at the north end of Duncan Canal on north-central Kupreanof Island, 17 miles west-northwest of Petersburg. The prospect sits at an elevation of approximately 1,300 feet on the south face of Kupreanof Mountain. The topography in the area is moderately steep. Dense conifer forest covers the ridge slopes, and muskegs are common on the ridge crest. Covering the prospect are four patented mining claims (MS 652) that at one time were an inholding within the Petersburg Creek-Duncan Salt Chuck Wilderness area (as defined by the Alaska National Interest Lands Conservation Act, 1980). The patented claim holders subsequently turned the property over to the Forest Service to manage as wilderness. Access is most easily accomplished by taking a helicopter to the ridge crest above the property (which marks the boundary of the wilderness area) and then descending to the prospect on foot.

History

The claims at Northern Copper were first staked in 1900 (Wright and Wright, 1908). They were active between 1900 and 1901 and between 1918 and 1921. Between 1900 and 1901, the claims were held by the Portage Mountain Mining Co., which also held claims approximately 6 miles to the east on Portage Mountain. This company prospected the claims with adits and shafts (Wright and Wright, 1908). Sometime after 1906, the property was acquired by the Kupreanof Mining Co., which began the construction of a plank road to tidewater in 1918. The road was intended to connect to an aerial tram, which, in turn, was to connect to the prospect on the mountainside above (Buddington, 1923). The tram was apparently never constructed, as no evidence or mention of its existence was found. In 1920 the claims were purchased by the Northern Copper Co., which began exploring the prospect by extending adits as well as cutting trenches, opencuts, and pits (Buddington, 1923). Development ceased in 1921, and the property remained idle until it was restaked in 1944 (U.S. Bureau of Mines, 1945). Bureau of Mines and USGS personnel examined the property in the 1940's (U.S. Bureau of Mines, 1945; Twenhofel and others, 1949). The renewed interest was probably driven by demands of the war effort. After the 1940's, there is no published evidence of activity at the site until the late 1970's.

In 1978 Amoco Minerals Co. (Amoco) staked a large block of claims at the north end of Duncan Canal that covered the Northern Copper prospect. In 1978 and 1979 the company carried out airborne geophysical surveys; ground electromagnetic, magnetic, and gravity surveys; geologic mapping; soil and stream sediment geochemical sampling; and core drilling. In the Northern Copper area, weak airborne EM anomalies were further delineated by ground EM and soil geochemical surveys. Six diamond drill holes were subsequently drilled to evaluate the anomalies (Zelinski, 1979?; Amoco Minerals Company, 1979).

Four claims belonging to the Kupreanof Mining Co. were patented in 1907 (Bureau of Land Management, MAS) in the name of John Johnston (Patent No. 44523), who may have been a representative of the Portage Mountain Mining Co., the likely claim holders at the time of patent. These four claims were acquired by Boochever, Dubuar, and Hansen, who then deeded the property to the Forest Service for inclusion in the Petersburg Creek-Duncan Salt Chuck Wilderness area in 1995.

Mineral Assessment

The Northern Copper prospect lies within an undifferentiated belt of volcanic rocks (Brew and others, 1984; Brew, 1997m) that elsewhere in the Duncan Canal area are associated with VMS deposits. New mapping in the area by Karl and others (1999) after the release of airborne geophysical data (ADGGS, 1997a-m) dates the Northern Copper host rocks as Devonian. The mineralized rock has been described as a replacement-type deposit by past investigators (Buddington, 1923; U.S. Bureau of Mines, 1945; Twenhofel and others, 1949) and, as such, may not be related to Triassic VMS deposits in the area.

Historic developments at Northern Copper include numerous workings, many of which are now caved and overgrown. Most of these are concentrated at an elevation of approximately 1,300 feet, where a shaft and at least eight trenches, opencuts, and pits have been developed (figs. 8, 9). The shaft (fig. 10), when examined in 1998, was 28 feet deep, although two earlier reports give different descriptions–50 feet deep (U.S. Bureau of Mines, 1945) and 40 feet deep with a drift at the bottom (Twenhofel and others, 1949). Three adits were also developed on the property. One, at an elevation of approximately 1,200 feet, was driven to undercut the mineralized rock exposed in the shaft. It is presently caved, but was reportedly 354 to 375 feet long (U.S. Bureau of Mines, 1945, and Twenhofel and others, 1949, respectively). A second adit, 30 feet long, lies approximately 1,500 feet northeast of the shaft at an elevation of approximately 1,100 feet. It was cut to follow a band of mineralized rock exposed in a small, adjacent creek bed. BLM personnel located a third adit, the “lower” adit, at an elevation of 1,180 feet on the north side of a small creek that flows to the east and drains the area of the main workings. The adit extends for 285 feet and exposes bands or layers of mineralized rock from near its portal to its face (figs. 11, 12).

The BLM's investigation included surveying the main workings (fig. 8); mapping and sampling the shaft (fig. 10) and the lower Northern Copper adit (figs. 11 and 12); and mapping and sampling where mineralized rock was easily exposed in the trenches, pits, and opencuts (fig. 9). Because much of the area is overgrown, the investigation was confined to discrete outcrops, which present an incomplete picture of the nature of mineralization in the area.

Mineralized rock is exposed in three main places in the Northern Copper area: (1) near the main workings, in the shaft and adjacent trenches (map nos. 25.3-25.18), (2) in the 285-foot lower adit (map nos. 25.32-25.44), and (3) in the 30-foot adit (map no. 25.2).

Mineralized rock in the area of the main workings consists of sulfide-bearing greenstone and chlorite schist. The sulfides are mainly pyrrhotite with pyrite, chalcopyrite, and sphalerite. They occur in massive lenses, as well as patches and disseminations within the host rock. Two lenses of massive sulfide are partially exposed in the main trench (fig. 9). Their largest dimensions are only about 2 to 3 feet. The lenses are hosted by greenstone and chlorite schist at the base of a massive greenstone bed. Disseminated sulfides are found concentrated in the greenstone along with skarn minerals. The massive lenses generally contain more chalcopyrite than sphalerite; whereas, the disseminated sulfides in the greenstone generally consist of more sphalerite than chalcopyrite.

Skarn minerals include garnet and radiating crystals of pyroxene, likely altered to amphibole. The skarn minerals are generally restricted to the massive greenstone units and are commonly accompanied by silicification of the greenstone. White, coarsely crystalline marble is found in layers and lenses that are commonly oriented parallel to the foliation/layering in the chlorite schist and greenstone. Nowhere were sulfides, particularly massive sulfides, found associated with the marble.

Another mineralized interval in the main workings area is described in an unpublished Amoco report on the Northern Copper area (Zelinski, 1979?). It occurs in gray argillites approximately 80 feet stratigraphically below the massive greenstone bed exposed in the main trench. The massive sulfides in this interval are mainly pyrrhotite with variable amounts of chalcopyrite. Samples as high as 22.4 percent copper were collected, but the massive sulfide layer was not found to exceed a thickness of 2 feet at any point. The zone is said to be relatively continuous, but the grades are variable (Zelinski, 1979?).

BLM personnel collected 36 samples from the shaft, trenches, pits, and dumps in the main workings area. Analytical results revealed elevated concentrations of copper and zinc, with minor silver and trace gold. The highest copper values were 1.7 percent over 1.5 feet (map no. 25.10, sample 8684), 1.4 percent over 1.8 feet (map no. 25.13, sample 3714), and 3.5 percent in a select sample from an outcrop (map no. 25.7, sample 3666). Zinc values ranged up to 1.2 percent over 3 feet (map no. 25.20, sample 108) and 2.4 percent over 1.5 feet (map no. 25.14, sample 3715) in silicified greenstone. Silver and gold values ranged up to 32.6 ppm silver (map no. 25.7, sample 3666) and 165 ppb gold in a massive sulfide lens (map no. 25.17, sample 3725).

Mineralized rock exposed in the 285-foot lower adit consists of two types: massive sulfide layers and disseminated sulfides (figs. 11, 12). A continuous layer of massive pyrrhotite with chalcopyrite and minor sphalerite, 0.2 to 1.7 feet thick, is exposed for approximately 100 feet near the face of the adit. The layer is offset in four or five places by apparent dip-slip movement on northeast-striking, southeast-dipping faults (fig. 12). The massive sulfide layer is hosted by chlorite schist and is commonly on or near the contact with dark gray to black, fine-grained phyllite, which it structurally overlies. Samples across the layer of massive sulfide ranged up to 3.1 percent copper and 1,427 ppm zinc over 0.6 feet (map no. 25.23, sample 3685), and 2.5 percent copper over 1.4 feet (map no. 25.23, sample 3806). Precious metal values in the massive sulfide are low; they range up to 29 ppb gold (map no. 25.23, 3806) and 11.5 ppm silver (map no. 25.23, 3685).

The second type of mineralized rock in the lower adit consists of a silicious band of chlorite schist containing pyrrhotite (both disseminated and in veinlets) and very minor chalcopyrite. This band structurally underlies the layer of phyllite described above. Analytical results indicate little significance to this second type of mineralized rock. Results ranged up to 860 ppm copper and 369 ppm zinc over 2.2 feet (map no. 25.23, samples 3810, 3687).

The 30-foot adit northeast of the main workings was driven to cut a band of massive sulfide exposed in a small creek. The band is concordant to foliation in the host rocks; it strikes 330° to 345° and dips 10° to 30° to the southwest. The band is from 0.25 to 2 feet thick and is exposed for approximately 20 feet along strike, both in the adit and in the adjacent creek. It consists of pyrrhotite, pyrite, and chalcopyrite. Samples from the band of sulfides contained up to 12.4 percent copper over 2 feet (map no. 25.2, sample 415). Precious metal values from samples of the sulfide band were higher than elsewhere in the Northern Copper area, but still were low. Gold values ranged up to 440 ppb (map no. 25.2, sample 417) and silver to 37.7 ppm (map no. 25.2, sample 415).

Conclusions

There is some question regarding the paragenesis of the mineralized rock at the Northern Copper prospect. Although some skarn minerals are present, there is very little identified carbonate rock in the area and no obvious intrusives. Some investigators have thought the rocks represent VMS mineralization (Zelinski, 1979?). Karl and others (1999) assign a Devonian age to the rocks at the Northern Copper prospect, and as such, they would not be associated with the area's Triassic VMS deposits. As a replacement or skarn deposit, the occurrence at Northern Copper is of less significance. The mineralized zones are relatively thin, and although they are exposed over a large area, they make up only a small percentage of the host rock. Precious metal values are also low. Since the Northern Copper property is now part of the Petersburg Creek-Duncan Salt Chuck Wilderness area, evaluation of the property may provide insight into other mineral prospects in the Duncan Canal area, but exploration incompatible with its wilderness status is prohibited.

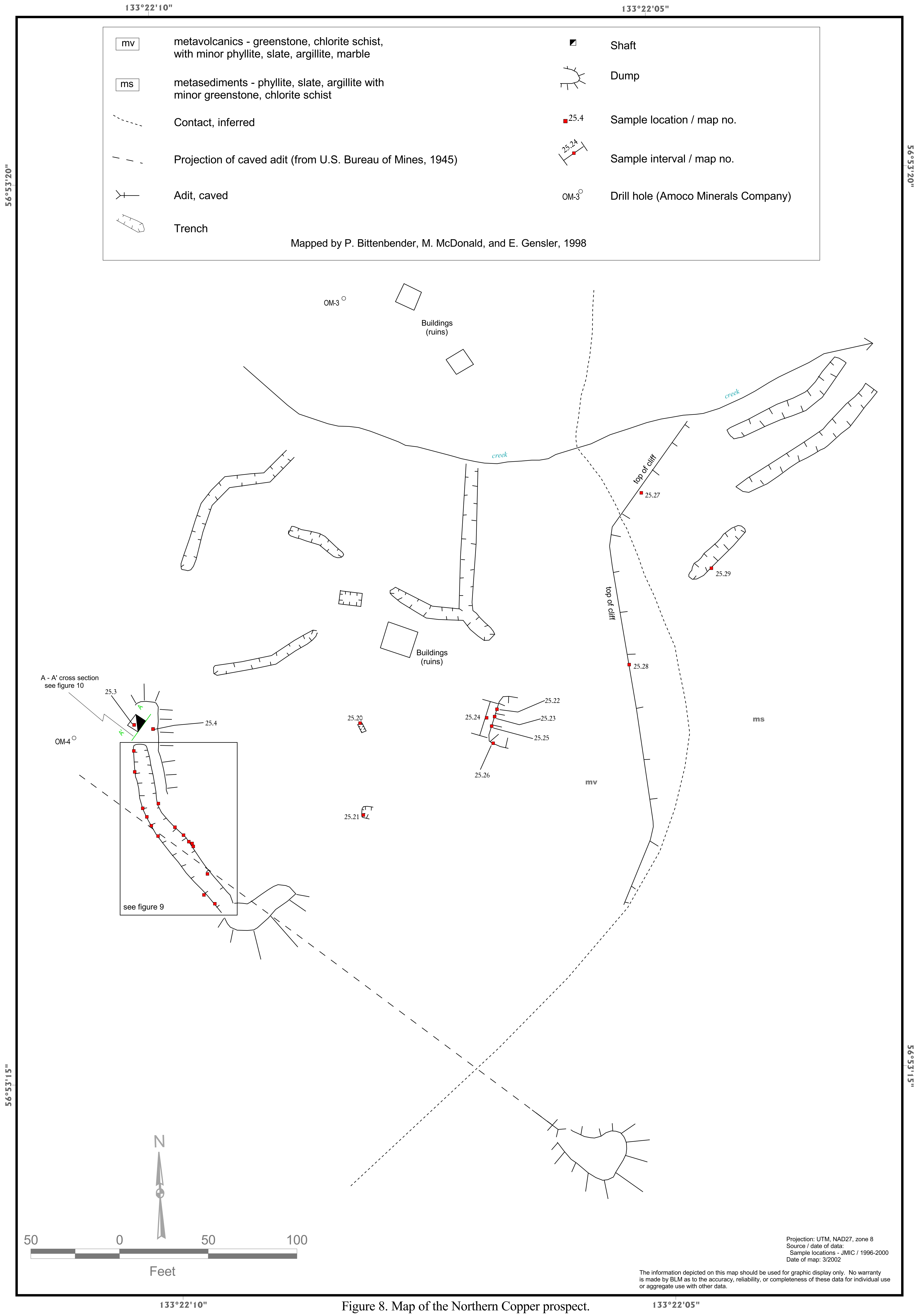


Figure 8. Map of the Northern Copper prospect.

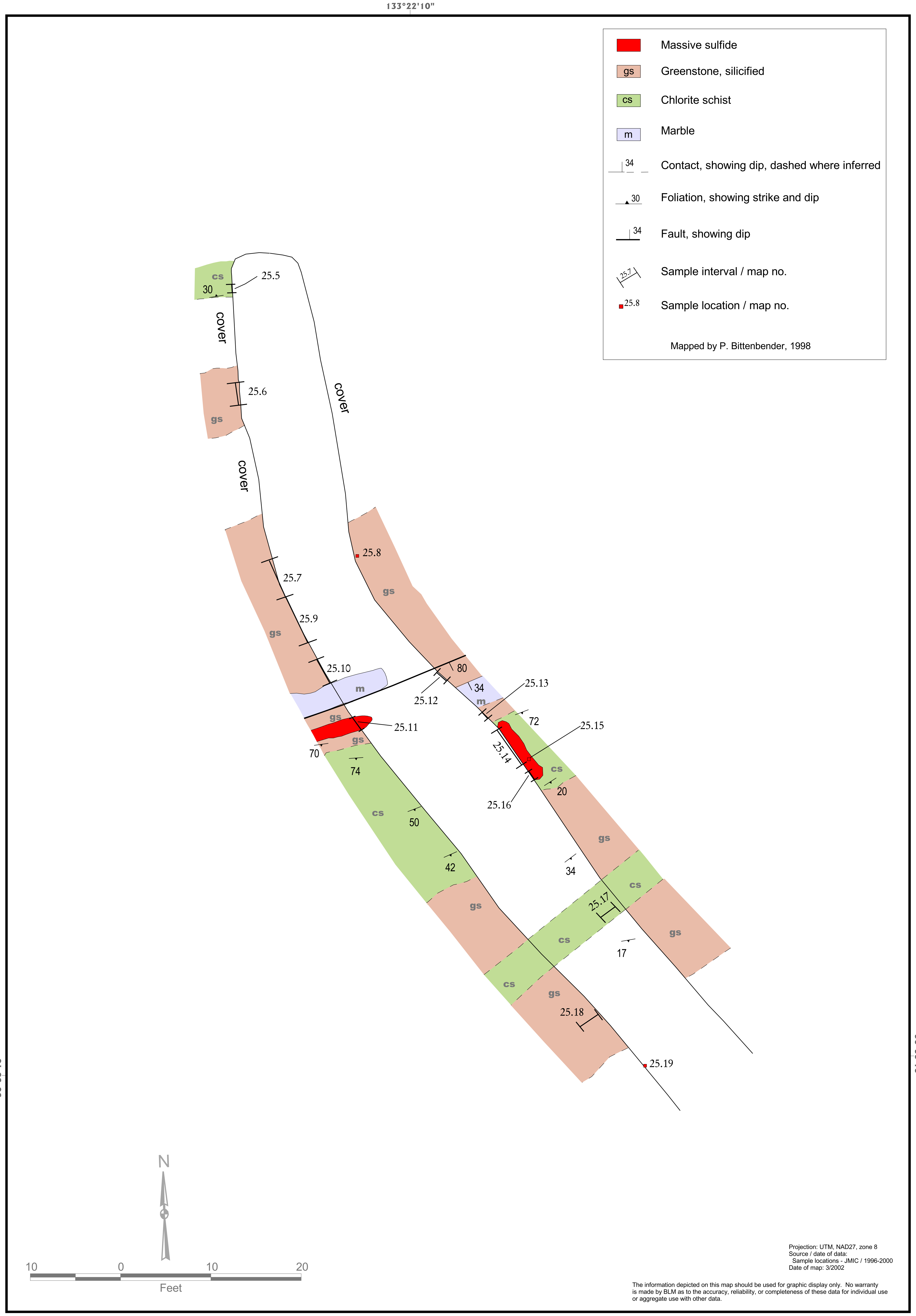


Figure 9. Map of the Northern Copper main trench.

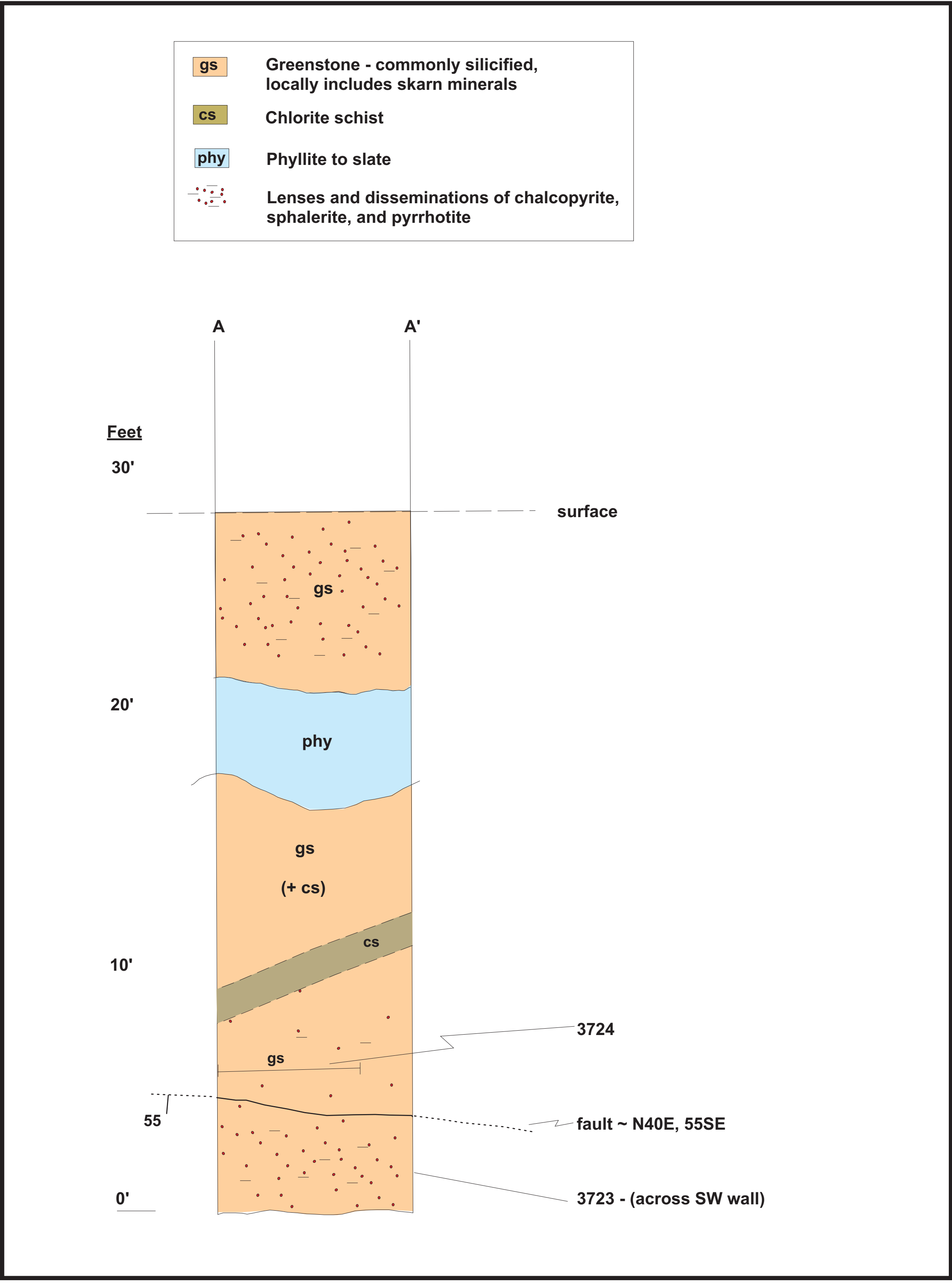


Figure 10. Cross section of the southeast face of the Northern Copper shaft. Section A A' location shown on figure 8.

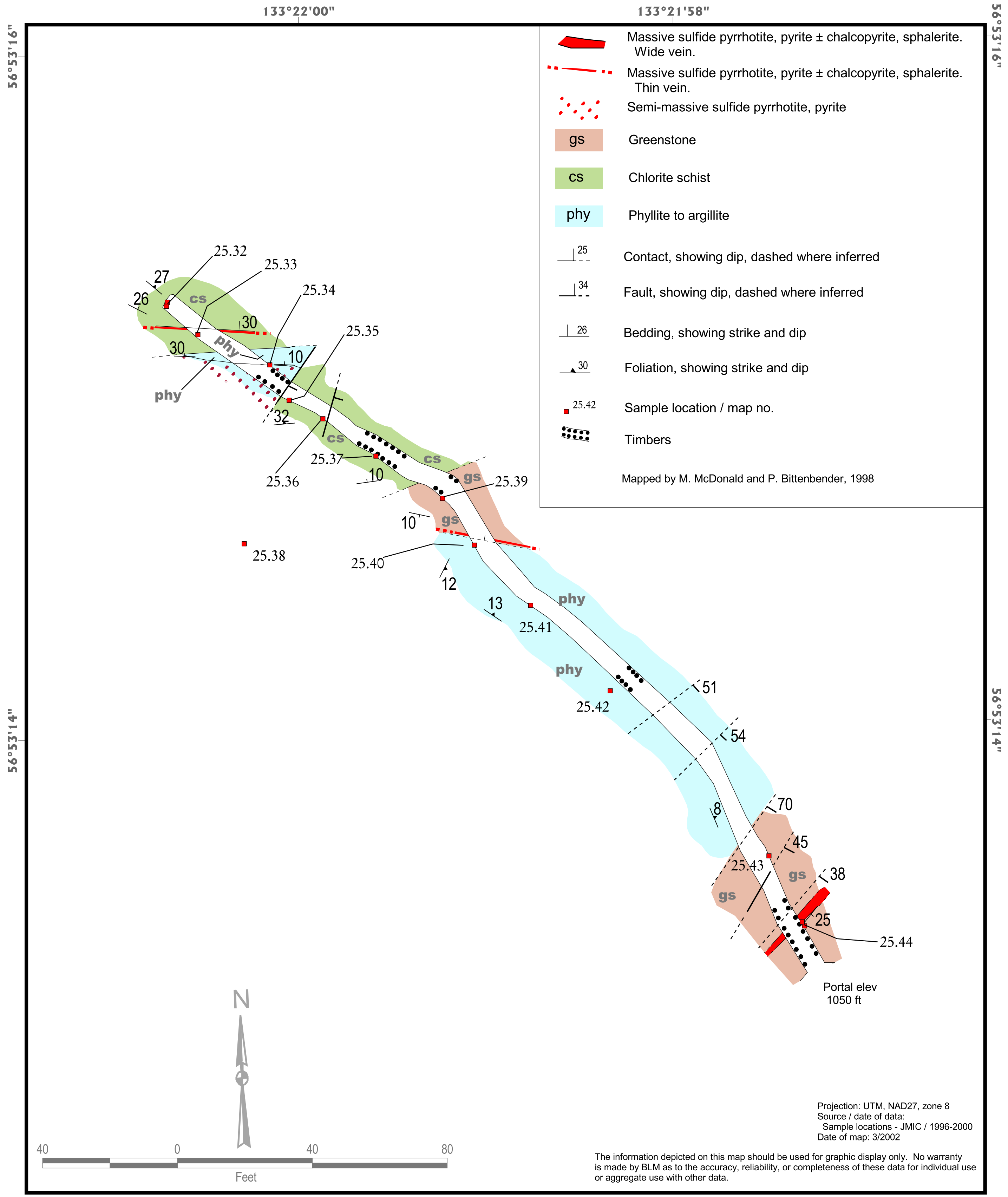


Figure 11. Map of the Northern Copper lower adit. Profile of southwest rib shown in figure 12.

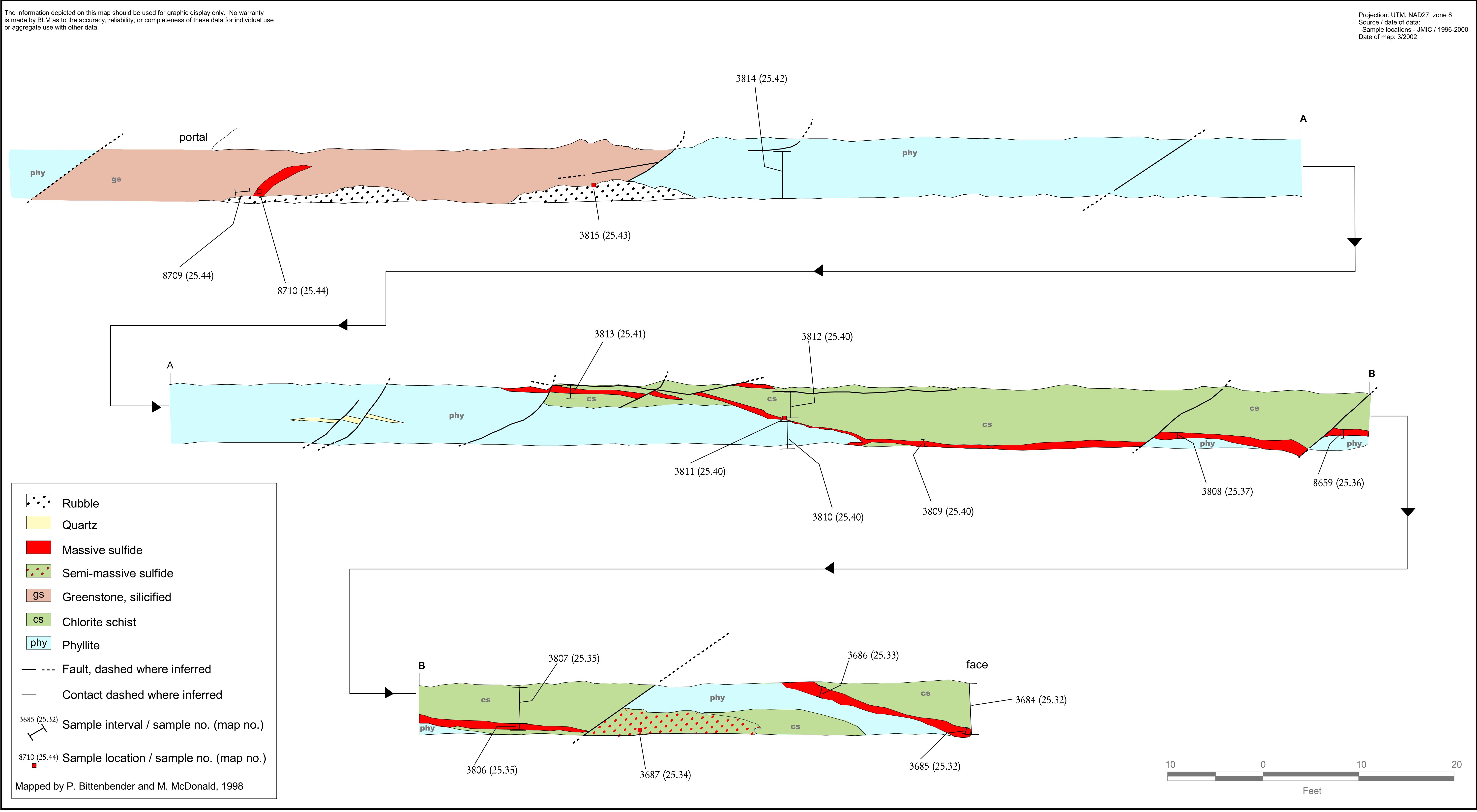


Figure 12. Profile of the southwest rib of the Northern Copper lower adit. Plan view shown on figure 11.

PORTAGE BAY PIT

(Plate 1, Map no. 26)

MAS no.:	0021170193	*Quadrangl*	Petersburg D4
Deposit Type:	P: Cu, Mo; PV: Au, Ag, Zn, Pb	*Latitude:*	56.9145
Land Status:	Open Federal	*Longitude:*	-133.2687
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Portage Bay Pit is on northern Kupreanof Island, half a mile south of the head of Portage Bay. The site is 14 miles northwest of Petersburg. The occurrence is exposed in a borrow pit from which material was removed to construct part of the Portage Bay road system (photo 10). The road system extends around the bay, connecting the borrow pit at the head of the bay with the log transfer facility and logging camp near its mouth. The bay is accessible by boat or float plane; and the pit, by road or helicopter.

History

In 1998 BLM personnel discovered copper and molybdenum in a borrow pit south of Portage Bay. No mention of this site is known to exist in published literature.

Photo 10. Aerial view of Portage Bay borrow pit that exposes sulfide mineralization. Photo by P. Bittenbender.

Mineral Assessment

The country rock exposed in the Portage Bay Pit is a fine- to medium-grained, dark gray to dark green diorite(?). Geologic maps of the area do not indicate the presence of an intrusive body in the immediate area; however, Cretaceous age quartz monzonite to diorite bodies have been mapped to the north and south of the pit (Brew and others, 1984; Brew, 1997l).

Pyrrhotite is almost ubiquitous in the intrusive and makes up approximately 1 to 2 percent of the rock. Very fine grained, disseminated chalcopyrite is also common across the pit, but makes up only a fraction of a percent of the rock. Pyrite is also common. The sulfides commonly occur as thin coatings on fracture surfaces. Rare coatings of molybdenite are also present on fracture surfaces.

Several faults cut the intrusive in the pit. Along the faults, sulfides are commonly concentrated in the sheared and altered rocks. One of the faults, oriented with a strike of 315° and dip of 77° northeast, contains bands of sulfides that include mainly pyrrhotite with chalcopyrite, sphalerite, galena, arsenopyrite, and pyrite.

To the north of the pit, the hornfels that hosts the intrusive is exposed. The host rock is fine-grained and well indurated, with evidence of bedding planes in some places indicating that it is likely a metasediment. The rocks in the area have been mapped as Cretaceous phyllite, derived from sediments of the Jurassic to Cretaceous Seymour Canal Formation (Brew and others, 1984; Brew, 197l).

BLM personnel examined the Portage Bay rock pit and collected 12 samples. The average of four random, representative samples collected across the pit was 163 ppm copper (map no. 26.2, samples 2803-06). These samples ranged in length from 8 to 20 feet. Higher-grade samples were collected from sulfide-rich, silicified zones that seem to be concentrated near faults. Examples of these altered zones were found in one place on the northwest side of the pit as well as in rubble on the pit floor. One select sample of sulfide-rich material contained 3,271 ppb gold, 13.9 ppm silver, 3,025 ppm copper, 4,708 ppm lead, 1.4 percent zinc, and 9,762 ppm arsenic (map no. 26.2, sample 3674). Other samples contained up to 855 ppm molybdenum (map no. 26.2, sample 3678), and 1,365 ppm nickel (map no. 26.2, sample 3682).

BLM personnel collected a sample of road material northwest of the Portage Bay Pit that was similar to the higher-grade material concentrated near the faults in the pit. The road material likely came from the Portage Bay Pit. Analysis of the sample returned 0.296 oz/t gold, 40 ppm silver, 1,227 ppm copper, 2.22 percent lead, 3.69 percent zinc, and greater than 10,000 ppm arsenic (map no. 26.1, sample 6371). BLM investigators found additional sulfide mineralization in intrusive rocks 7 miles northwest of the pit that appeared somewhat similar to that in the pit. Samples of the intrusives revealed 165 to 294 ppm copper (pl. 2, map nos. R80, R81, R83, R84, samples 3676, 6372, 6373, 6375) and 1,516 ppm molybdenum (pl. 2, map no. R81, sample 6375).

Conclusions

The disseminated nature of the pyrrhotite and minor chalcopyrite in the intrusive rock exposed in the Portage Bay Pit suggests the potential for a porphyry-type deposit. However, there are no significant porphyry systems of Cretaceous age known in the area. The wide extent of mineralized rocks in the Portage Bay area, the higher-grade zones with elevated precious metals, and the potential for porphyry-type deposits to be large may attract exploration interest.

IRONTON

(Plate 1, Map no. 27)

MAS no.:	0021170196	*Quadrangle:*	Petersburg D5
Deposit Type:	VMS	*Latitude:*	57.4806
Land Status:	Open Federal	*Longitude:*	-133.4763
Development:	Adit, trenches	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Ironton prospect is near tidewater on the west side of Towers Arm, 1 to 1½ miles from its head. It is 15 miles west of Petersburg. Access to Towers Arm is possible by boat or float plane, but extensive mud flats make water access difficult at low tides. Helicopter access is easy at low tide.

History

J.C. Roehm, a mining engineer with the Territorial Department of Mines, mentions in his 1945 report that the Ironton group of six claims on "Tower Bay" were located by Mary and Mike McKallick and G.W. Morgan (Roehm, 1945). In a subsequent report, following an investigation of the property in 1946, Roehm describes five claims located by Mary and Mike McKallick. He notes in his description that the only workings that he observed on the property consisted of "old" trenches (Roehm, 1946). This indicates that the property was discovered and explored with trenches at least several years before 1945. This early history is not known to have been recorded.

Mineral Assessment

The west side of Towers Arm in the vicinity of the Ironton prospect has been mapped as Triassic Hyd Group volcanic, and volcanic and sedimentary rocks. The northern Ironton location, map no. 27.1, is in an area mapped as Devonian metavolcanic rocks (Karl and others, 1999).

BLM personnel traversed the shoreline along the west side of Towers Arm and located apparent cuts in the bluffs along the shore as well as a short adit and trench. This appears to be similar to the setting described by Roehm (1946). He describes greenstone schists impregnated with sulfides and specks of zinc and lead sulfides in pyrite seams (Roehm, 1946).

BLM personnel found country rock in the area that consists of interbedded greenstone, greenstone schist, quartz-calcite-chlorite schist, sericite schist, and black slate. Many of these rocks locally contain quartz-calcite lenses and veinlets. The greenstone contains disseminations, patches, and veinlets of pyrite. In the more foliated rocks, pyrite is common in seams and lenses parallel to the foliation. Very fine to medium-grained pyrite from about 3 to 15 percent of the rock is common in the area. Iron staining is common in many of the outcrops along the shoreline and in the adjacent 10- to 15-foot bluffs. Metavolcanic rocks sparsely mineralized with pyrite are exposed along the shoreline for about half a mile in the Ironton area.

The country rock in the vicinity of the adit and trench is a sericitized metavolcanic. There is also more pyrite, up to about 15 to 20 percent of the rock. The pyrite is fine-grained, mainly disseminated, but also banded parallel to foliation and in lenses. Gossan is common in the exposed rocks near the adit.

BLM personnel collected 10 samples to evaluate the Ironton area. The samples contained very low precious and base metals; the highest precious metal values were 18 ppb gold and 0.2 ppm silver (map no. 27.2, sample 8796) and the highest base metal values were 281 ppm copper (map no. 27.1, sample 3913), 4 ppm lead (map no. 27.2, sample 3908), and 93 ppm zinc (map no. 27.1, sample 3912). However, many of the samples contained elevated nickel, cobalt, and mercury, with up to 66 ppm nickel (map no. 27.2, sample 8795), 56 ppm cobalt (map no. 27.1, sample 3913), and 2.115 ppm mercury (map no. 27.2, sample 8796) . About half the samples were elevated in barium, up to 3,943 ppm (map no. 27.2, sample 3909). None of these elements approach the concentrations necessary to be considered commodities, however.

Conclusions

Analytical results from samples collected by the BLM in the Ironton area reveal low precious and base metals. The only apparent significance of the prospect is the extent of sulfide mineralization and evidence of VMS-type mineralization associated with Triassic Hyd Group volcanic and sedimentary rocks. The zinc and lead sulfides that were reportedly associated with some of the pyrite seams (Roehm, 1946) were not detected. The VMS type of mineralization and the broad extent of mineralized rock in the Ironton area may attract mineral exploration in the future.

SALT CHUCK
(Plate 1, Map no. 28)

MAS no.:	0021170195	*Quadrangle:*	Petersburg D4
Deposit Type:	PR?, VMS?: Cu, Zn, Pb	*Latitude:*	56.8408
Land Status:	Closed Federal	*Longitude:*	-133.3226
Development:	5 DDH, cuts	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Medium

Location/Access
The Salt Chuck prospect is on the peninsula between Towers Arm and North Arm at the head of Duncan Canal on Kupreanof Island, 15 miles west of Petersburg. The topography of the area is gently sloping, with muskegs, dense brush, and thick timber stands. The area was temporarily withdrawn from mineral entry in 1978 until RARE II (Roadless Area Review and Evaluation) wilderness areas had been designated by Congress. In 1980 the prospect was included in the Petersburg Creek-Duncan Salt Chuck Wilderness area (defined by the Alaska National Interest Lands Conservation Act, 1980). Access to the prospect is by boat, on foot, or by helicopter–if special permission is obtained to access the wilderness area.

History
In 1978 Amoco Minerals Co. (Amoco) staked a large block of claims covering the Salt Chuck prospect at the north end of Duncan Canal. The company's geologists were among the first to recognize the importance of VMS deposits in the Duncan Canal area. In 1978 and 1979 the company carried out airborne geophysical surveys; ground electromagnetic, magnetic, and gravity surveys; geologic mapping; soil and stream sediment geochemical sampling; and core drilling. In the Salt Chuck area, airborne EM anomalies were further delineated by ground EM and soil geochemical surveys. Five diamond drill holes were subsequently drilled to evaluate these anomalies (Zelinski, 1979?; Amoco Minerals Company, 1979).

Mineral Assessment
The Salt Chuck prospect is hosted in Devonian phyllite, schist, and greenstone (Karl and others, 1999). The rocks trend northwest and dip steeply to the southeast. The prospect is defined by an 8,000-foot-long, northwest-trending geophysical anomaly identified by airborne and ground geophysics. Three verified bedrock conductors are shown on an Amoco map. Five holes were drilled into the Salt Chuck anomaly. They range in length from 600 to 1,000 feet and explore the anomaly for approximately 5,000 feet along strike. Amoco describes the massive sulfide bands on this prospect as thin, discontinuous, and generally low-grade. The best intersections occurred in one hole where 1.7 feet averaged 1.86 percent copper and another 10 feet averaged 0.877 percent copper (Zelinski, 1979?; Amoco Minerals Company, 1979).

Amoco geologists discovered two mineralized outcrops during their examination of the prospect. The westernmost is located on the peninsula between Towers and North Arms, 3 miles north of the peninsula's tip and 2,000 feet inland from North Arm. The outcrop is located midway along the length of the anomaly and is described as a 10-foot-long by 5-foot-wide band of chalcopyrite hosted in rhyolite. (There is an inconsistency between the text description given above and an Amoco map that indicates a 16-foot sample/outcrop. BLM examination indicates that the text is correct.) Amoco samples collected across the outcrop averaged 6.3 percent copper, 0.02 percent zinc, and 0.32 oz/t silver. The other mineralized zone is located 2,000 feet to the east, on the west side of Towers Arm. Here, three sulfide bands are exposed along the beach; each is less than 6 inches wide and composed of chalcopyrite, sphalerite, and galena hosted in rhyolite. The bands contain from 0.01 to 0.13 percent copper, 0.10 to 25.3 percent lead, 0.15 to 7.8 percent zinc, and from 0.2 to 13.62 oz/t silver (Zelinski, 1979?; Amoco Minerals Company, 1979).

The BLM's examination of the Salt Chuck prospect revealed bands of disseminated to massive sulfides at two locations, called the "Salt Chuck Copper" to the west and "Salt Chuck Zinc" to the east (map nos. 28.1-28.2). These are at or near the two mineralized locations described above by Amoco geologists.

The Salt Chuck Copper occurrence consists of a band of sulfides exposed in three cuts. The cuts are up to 4 feet wide and are aligned along strike and separated by 84 feet and 30 feet of muskeg. The host rock is rusty yellow, iron-stained, silicified chlorite schist. It is more resistant to weathering than the surrounding rock, so it forms ridges that stand out above the surrounding muskeg. The mineralized band is conformably hosted in schist that strikes 320°, dips steeply to the northeast, and is coincident with the geophysical anomaly. The band contains disseminated to massive pyrite and chalcopyrite. Samples averaged across 3.8 feet at the northernmost outcrop contained 0.8 percent copper and 3.4 ppm silver (map no. 28.1, samples 279-280). A 1.0 foot sample across the most mineralized part of the middle outcrop contained 3.0 percent copper and 3.4 ppm silver (map no. 28.1, sample 269). A 1.3-foot-long sample across the southernmost outcrop contained 1.1 percent copper and 2.8 ppm silver (map no. 28.1, sample 513). A 0.4-foot, high-grade sample from the northernmost outcrop contained 7.1 percent copper and 9.9 ppm silver (map no. 28.1, sample 109).

At the Salt Chuck Zinc location, silicified schist hosts narrow, conformable quartz veins. One of these veins, 0.5 feet thick, contains blebs and bands of pyrite and sphalerite. A sample across it contained 5,898 ppm zinc (map no. 28.2, sample 115). A 1.2-foot sample across adjacent pyritized, silicified schist did not contain significant metal values (map no. 28.2, sample 114). A 0.075-foot-thick vein in the vicinity contained 2.3 percent zinc (map no. 28.2, sample 9647).

Conclusions

The Salt Chuck prospect is hosted in Devonian rocks and may not be of VMS origin as initially suspected by Amoco geologists (Karl, and others, 1999: Amoco Minerals Company, 1979). It is most likely a polymetallic replacement deposit, although the conformable character and extent of the sulfide mineralization suggest VMS origins. The prospect has been sufficiently explored by shallow drilling to preclude a significant near-surface deposit. (Amoco Minerals Company, 1979). The wilderness land designation covering the Salt Chuck prospect prohibits exploration and mining in the immediate area.

PORTAGE MOUNTAIN GROUP

(Plate 2, Map no. D10)

MAS no.:	0021170012	*Quadrangle:*	Petersburg D4
Deposit Type:	Vein?: Au, Ag, Cu	*Latitude:*	56.8763
Land Status:	Closed Federal	*Longitude:*	-133.2431
Development:	Adit(?), cuts	*MDP:*	Low
BLM work:	Not found	*MEP:*	Low

Location/Access

The Portage Mountain Group is reportedly located between 2,000 and 3,000 feet elevation on the west side of Portage Mountain, which is east of the North Arm of Duncan Canal. The site is approximately 12 miles west-northwest of Petersburg. Access to the area is easiest by helicopter; however, the historic prospect is located in what is now the Petersburg Creek-Duncan Salt Chuck Wilderness area, which means helicopter access is restricted. The prospect is presumably accessible by foot from the North Arm of Duncan Canal, but this would require an arduous hike up the western slopes of Portage Mountain. The North Arm is accessible by boat or float plane. The relatively shallow water and extensive mudflats in North Arm mean access is best timed with the tides. The wilderness status of the area precludes mineral entry and development.

History

There is some confusion in the published literature on the Portage Mountain Group as to the descriptions and location of the claims. Most of the early literature describes quartz veins above about 2,000 feet on the west side of Portage Mountain (Wright and Wright, 1908; Roehm, 1945). Other reports describe workings around 900 feet elevation (Wright, 1909) and still others describe mineralized rock at 400 feet (Buddington, 1923).

After review of the available literature and field investigations, the authors of this report define the Portage Mountain Group as a historic prospect for gold in quartz veins located around 2,000 to 3,000 feet elevation on the west side of Portage Mountain. We think Wright's (1909) description of the Portage Mountain Group workings at 900 feet elevation are mistaken with workings on the Northern Copper prospect to the west of the North Arm of Duncan Canal (map no. 25). Buddington (1923) describes magmatic-segregation-type mineralized rock that the authors of this report define as the Portage Creek occurrence (map no. 29). Reports by Berg and Cobb (1967) and Cobb (1972) combine descriptions of the Portage Creek magmatic segregation and the Portage Mountain quartz veins occurrences.

The Portage Mountain Group was discovered and prospected prior to 1904 (Wright and Wright, 1905). The last report of activity at the prospect was by Wright and Wright in 1908. At that time, the workings at the site were described as small open cuts. J.C. Roehm examined the prospect in 1945 and described the workings as consisting of a 130-foot adit and open cuts (Roehm, 1945). This indicates development work subsequent to 1908, but there are no known published accounts describing the work.

Mineral Assessment
BLM personnel were unable to locate the Portage Mountain Group prospect. Several traverses were made in the area without locating any of the workings. After examining the area and reviewing the literature, the authors of this report believe the workings may be located in the northeast quarter of the northwest quarter of section 2, T. 58 S., R. 77 E. In this area, Jurassic to Cretaceous Seymour Canal Formation (Karl and others, 1999) or Cretaceous Stephens Passage Group (Brew, 1997l) metasedimentary rocks have been cut by a Cretaceous diorite (Brew, 1997l; Karl and others, 1999).

The occurrence at Portage Mountain is described as four, northeast-striking quartz-calcite veins, a few feet wide, that cut slates and greenstones (Wright and Wright, 1905, 1908). Diorite dikes intrude the host rocks (Wright and Wright, 1908). Some of the mineralized rock is hosted by northeast-trending faults, and some occurs where the northeast faults intersect north-south faults. The veins are reported to include pyrite, pyrrhotite, chalcopyrite, bornite, and tetrahedrite (Roehm, 1945) along with small amounts of gold and silver (Wright and Wright, 1908).

Conclusions
The occurrence at the Portage Mountain Group is probably of little economic significance. The veins are said to be relatively narrow and contain only small concentrations of precious and base metals. The fact that the area is now managed as wilderness precludes mineral exploration.

PORTAGE CREEK

(Plate 1, Map no. 29)

MAS no.:	0021170194	*Quadrangle:*	Petersburg D4
Deposit Type:	Mag Seg: Cu, PGE	*Latitude:*	56.8501
Land Status:	Closed Federal	*Longitude:*	-133.2598
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Medium

Location/Access

The Portage Creek prospect is on Portage Mountain, east of the head of Duncan Canal on Kupreanof Island. It is 12 miles northwest of Petersburg and lies within the Petersburg Creek-Duncan Salt Chuck Wilderness area. The prospect is at an elevation of approximately 400 feet on the west side of Portage Mountain. Mineralized rock is found mainly on the north side of a small creek that flows west-southwest. The slopes of the mountain extend from sea level to an elevation of over 3,600 feet. The area is covered by conifer forest. Access is easiest by helicopter to a muskeg north of the creek exposure; however, helicopter access is restricted due to the area's wilderness designation. Overland access is possible from North Arm on Duncan Canal.

History

Several authors have written about prospects that were active in the early 1900's on the west side of Portage Mountain (Wright, 1907; Wright and Wright, 1908; Wright, 1909; Buddington, 1923; Roehm, 1945). Review of the early reports indicates that at least two different prospects are described, one now called "Portage Creek" and the other called "Portage Mountain Group." The Portage Creek prospect refers to sulfides in hornblendite; the Portage Mountain Group refers to gold in quartz veins. Two other names are associated with prospects in the area, the Portage Mountain Mining Co. and the Portage Bay Copper Co. (Wright, 1907; Roehm, 1945). Both of these are believed to be associated with the Portage Mountain Group prospect (map no. D10).

The date of discovery of Portage Creek is unknown. Buddington (1923) reports opencuts on the Silver Star claim in 1921, which along with the Silver King claim, made up the 2-claim block in the area. No other exploration activity is known to have occurred at the prospect.

Mineral Assessment

The mineralized rock at Portage Creek consists of seams and disseminations of sulfides in hornblendite that appear to be a magmatic segregation from the dioritic country rock in the area. An Upper Cretaceous mafic intrusive has been mapped in the area and described as quartz monzodiorite to diorite (Brew and others, 1984).

Mafic segregations with sulfides are exposed in Portage Creek between 360 and 480 feet in elevation. In this area, at least five outcrops of hornblendite or hornblende diorite with disseminated pyrrhotite, pyrite, and chalcopyrite can be found. Three are on the north side of the creek and two are on the south side. The rock is commonly green-gray to black, coarsely crystalline with prominent phenocrysts of hornblende and biotite. Much of the hornblende-rich rock deteriorates upon weathering and crumbles easily.

The largest outcrop of mineralized rock is exposed along the north bank of the creek at an elevation of 450 feet. Poorly indurated, hornblendite is bounded by hornblende diorite and exposed for 60 feet along the creek bank. The hornblendite is cut by partially assimilated dikes of diorite and broken basalt dikes. Foliation in the hornblendite strikes west to northwest and dips steeply. Veinlets and stringers of pyrite and pyrrhotite up to 1 inch thick are common in the hornblendite and make up approximately 5 percent of the rock. Copper staining indicates the presence of copper minerals, but they likely make up less than 1 percent of the hornblendite.

BLM personnel collected 17 samples from the outcrops along Portage Creek (map nos. 29.1). All of them indicate the presence of minor amounts of copper, and some contained a trace of platinum and palladium, but little else. Seven samples were collected from the main outcrop on the northwest side of Portage Creek, where the highest copper values were found (map no. 29.1, samples 138-141, 2367-69). Samples ranged up to 4,666 ppm copper over 15 feet (map no. 29.1, sample 139) and 2,597 ppm copper over 40 feet (map no. 29.1, sample 2367). Ten samples collected from other sulfide-bearing outcrops below the main one on Portage Creek indicate lower copper values. Of these, a grab sample yielded the highest copper value of 925 ppm (map no. 29.1, sample 62). The highest platinum value was 39 ppb (map no. 29.1, sample 9600), and the highest palladium value was 59 ppb (map no. 29.1, sample 136) over 18 and 27 feet respectively.

Conclusions

The deposit at Portage Creek appears to be a magmatic segregation of sulfides from the mafic portion of an intrusive mass. Although sulfide mineralization is exposed for a large distance along Portage Creek, the precious and base metal values are low. In addition, the area is covered by a wilderness designation, which prohibits mineral exploration and development.

UPPER TAYLOR CREEK

(Plate 1, Map no. 30)

MAS no.:	0021170201	*Quadrangle:*	Petersburg D5
Deposit Type:	VMS: Au, Ag, Pb, Zn	*Latitude:*	56.7960
Land Status:	Open Federal	*Longitude:*	-133.3829
Development:	5 DDH	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Medium

Location/Access

The Upper Taylor Creek prospect is approximately 2 miles up Taylor Creek, which flows into Duncan Canal from the west, just south of Towers Arm on Kupreanof Island. The prospect is at an average elevation of 500 feet on the north-facing nose of the mountain south of Taylor Creek. It is 16 miles west of Petersburg. Access to the area is easiest by helicopter. Alternative access is by foot from the mouth of Taylor Creek, which is accessible by boat or float plane during favorable high tides.

History

The Upper Taylor Creek prospect was staked by Kennecott Exploration Co. in 1997 (Bureau of Land Management, ALIS). The company drilled at least five holes in 2000 to test an apparent geophysical and geochemical anomaly at the prospect (R. Franklin, oral commun., 2001). The results of their drilling have not been made public. There are no known published reports on mineralization at the Upper Taylor Creek prospect.

Mineral Assessment

The rocks in the Upper Taylor Creek area have been mapped as undifferentiated Triassic Hyd Group rocks including clastic sedimentary rocks, volcanics, and limestone (Karl and others, 1999). The BLM's brief investigation of an outcrop in the area revealed calcareous chlorite schist interbedded with calcareous graphitic slate. The chlorite schist is generally fine- to medium-grained, light green, well foliated and includes porphyroblasts of calcite, which may represent carbonate alteration or filling of vesicles in a mafic flow rock with calcite. The chlorite schist is intercalated with layers of slate that in the outcrop examined are up to 20 feet thick. The slate layers are oriented approximately parallel to foliation, which is northwest-trending and shallowly northeast dipping.

Mineralization at the outcrop consists of semi-massive to massive layers of pyrite in chlorite schist and slate, oriented parallel to foliation. Pyrite, from 20 to 50 percent, is generally fine-grained and associated with a matrix of silica. Most of the pyrite layers observed are inch-scale in thickness. Gossan is prevalent on some surfaces.

BLM investigators collected four samples of mineralized chlorite schist and slate from the Upper Taylor Creek outcrop. Analytical results from the samples indicate the presence of elevated precious and base metals. Sample 6335 (map no. 30.2) over 3.0 feet of semi-massive sulfide in chlorite schist returned 197 ppb gold, 19.2 ppm silver, 335 ppm lead, and 479 ppm zinc. Sample

6333 (map no. 30.2) over 0.6 feet of semi-massive sulfide in graphitic slate had higher lead and zinc values with 453 ppm lead and 2,518 ppm zinc. All the samples collected had elevated concentrations of arsenic, mercury, and barium, and at least slightly elevated nickel and cobalt. All of these elements have been determined to be indicator elements for Triassic VMS deposits of the Alexander terrane in southeastern Alaska (Taylor and others, 1995).

Conclusions

Little information is publicly available regarding the mineral occurrence at Upper Taylor Creek. Analytical results from samples collected by the present authors indicate anomalous concentrations of metals, but not in the range of being economically viable, even in relatively large volumes. Kennecott Exploration drilled a target at the occurrence based on geochemistry as well as a geophysical signature. Given the recent interest by Kennecott as well as the anomalous indicator elements that suggest the presence of a potential Triassic VMS deposit, the Upper Taylor Creek area is likely to attract continued mineral exploration attention.

TAYLOR CREEK

(Plate 1, Map no. 31)

MAS no.:	0021170013	*Quadrangle:*	Petersburg D5
Deposit Type:	PR: Ag, Zn, Pb	*Latitude:*	56.7961
Land Status:	Open Federal	*Longitude:*	-133.3579
Development:	4 DDH, trenches	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Taylor Creek prospect is near the head of Duncan Canal, 16 miles west of Petersburg. The prospect is exposed in Taylor Creek (1½ miles upstream from tidewater) and on a small knoll to the north. The topography of the area consists of muskeg flats and low hills covered by brush and timber. The outcrop in the creek lies at an elevation of approximately 160 feet; the outcrop on the knoll to the north, at approximately 400 feet. Access by helicopter is easiest; however, boat access to the mouth of Taylor Creek is possible at high tide.

History

Claims were first located at Taylor Creek in 1903 (Kerns, 1950) or 1904 (Wright and Wright, 1908). Early exploration to expose mineralized rock consisted of a 30-foot trench (Wright and Wright, 1908). Additional claims were staked in the area in 1912 (Alaska Kardex, 117-029), but the trench remained the only development on the property until the 1940's (Kerns, 1950).

In 1946 six claims were staked over the property, and a few small pits were excavated (Kerns, 1950; Alaska Kardex, 117–029). In 1948 the Bureau of Mines cut 280 feet of trenches and drilled 770 feet of core in four holes to evaluate the property (Kerns, 1950).

No published work has been accomplished at Taylor Creek since the 1940's. It has been investigated briefly by various workers, more as part of an inventory than an investigation of mineral potential (e.g., Grybeck and others, 1984; C.D.Taylor, written commun., 1998). In 1997 Kennecott Exploration Co. staked a block of claims that covered the Taylor Creek prospect, but results of its investigation have not been released to the public.

Mineral Assessment

The Taylor Creek prospect is hosted by dolomite that has been included in a unit of undifferentiated Hyd Group rocks of Triassic age (Karl and others, 1999). Units in the area strike to the northwest and dip to the northeast. Regional structures include broad, open folds with northwest-oriented axes and southwest-verging thrust faults (Karl and others, 1999).

Because of the detailed evaluation, including mapping, trenching, and drilling by the Bureau of Mines at Taylor Creek, BLM personnel restricted their investigation to corroborating the published geology and sample results. The following geologic description is taken from Kerns (1950, p. 4-5):

> The deposit was found to occur as patches that appear to replace the dolomitic limestone. The patches of mineralization are small, irregularly shaped, and distributed and do not occur in any recognizable pattern. The mineralized sections of the dolomitic limestone are better cemented and more blocky than the surrounding broken and fractured dolomitic limestone. The patches of minerals range from 2 to 12 feet in width and 4 to 10 feet in length.
>
> The deposit consists of a dissemination of galena and sphalerite associated with much pyrite and some marcasite. Pyrite is the predominant mineral, and the greatest amount of galena and sphalerite occurs where there is an abundance of pyrite.
>
> Very little sulfide was found in the gray-banded limestone that appears to underlie the buff dolomitic limestone or in the greenstone that appears to underlie the gray-banded limestone.

The four Bureau of Mines drill holes at Taylor Creek ranged in length from 66 to 291 feet. The best intercept was 5 feet of 0.8 oz/t silver, less than 0.1 percent lead, and 2.5 percent zinc. The highest lead value was in a 3-foot intercept of 0.6 percent lead, 0.5 oz/t silver, and 0.35 percent zinc. Surface samples that were cut across patches of mineralized rock exposed in the trenches north of Taylor Creek had higher values. Results include: 9 feet of 0.5 oz/t silver, 0.7 percent lead, and 4.3 percent zinc and 12 feet of 1.0 oz/t silver, 0.45 percent lead, and 1.4 percent zinc (Kerns, 1950).

BLM personnel collected seven samples from outcrops, trenches, and dumps at Taylor Creek. The best samples include 0.7 feet at 25.9 ppm silver, 7.72 percent lead, and 6.9 percent zinc (map no. 31.1, sample 53); a select sample with greater than 500 ppm silver, 7,217 ppm lead, and 2.1 percent zinc (map no. 31.1, sample 54); and a grab sample of gossan that returned 903 ppb gold, 160 ppm silver, 9.69 percent lead, and 3.0 percent zinc (map no. 31.1, sample 226). Several of the Taylor Creek samples also had elevated concentrations of arsenic, barium, and/or mercury (map no. 31.1, samples 51-54, 225-27).

The results of the Bureau of Mines drilling indicated the lack of an ore body at Taylor Creek, so no attempt was made to estimate tonnage and grade (Kerns, 1950). H.M. Fowler, a mining engineer with the Alaska Territorial Department of Mines, suggested that a lack of trenching prior to the drilling caused the Bureau of Mines to misplace their drill sites, which resulted in the agency's failure to adequately evaluate the mineralized zone (Fowler, 1948). No additional published work has been done at Taylor Creek, so the presence of an ore body is still in question.

Conclusions

The extensive work done by the Bureau of Mines at Taylor Creek, as well as the work of others, suggests only a minor potential for a significant deposit at the site. The replacement nature of the mineralized rock at Taylor Creek is similar to that in other places in the Stikine area, e.g., Cornwallis Peninsula. Although the replacement-type mineralization may be related to the VMS deposits in the area, it seems to have less mineral development potential than the bedded VMS deposits. It is unlikely to attract mineral exploration interest.

KANE PEAK
(Plate 1, Map no. 32)

MAS no.:	021170035	*Quadrangle:*	Petersburg D-4
Deposit Type:	Mag. Seg.: Fe?, PGE?	*Latitude:*	56.9017
Land Status:	Open Federal	*Longitude:*	-134.0786
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access
The Kane Peak prospect is 13 miles northwest of Petersburg, on the northeast side of Kupreanof Island. Kane Peak is the easternmost member of the Missionary Range on the north end of Lindenberg Peninsula. The mineralized intrusive at the prospect extends east from near the summit of Kane Peak to the vicinity of Cape Strait on Frederick Sound. The area around the peak is relatively steep and rugged, but the terrain slopes more gently closer to tidewater at Frederick Sound. The mineralized intrusive body is exposed from sea level to an elevation of over 3,000 feet near the summit.

Most of the area is covered with muskeg, brush, and timber; the best mineral outcrops are at the shoreline and above the tree line. The use of a boat or float plane is the best way to access the shoreline. But the higher-elevation exposures on Kane Peak are most easily accessed by helicopter.

History
A.F. Buddington's examination of the Kane Peak area in 1923 is the first record of activity at the site (Buddington and Chapin, 1929). Kennedy and Walton of the USGS investigated the area in August 1943 and described the geologic features of the intrusive complex. They did not collect any samples for analysis, however, because the sulfide-bearing pyroxenite was reported to contain only 1 to 2 percent sulfides (Kennedy and Walton, 1946).

Kennedy and Tolstoy made a topographic map of the area in 1946. They also produced a detailed geologic map, but their study of the area was confined mainly to the southwestern part of the complex (Kennedy and Walton, 1951).

In 1960 the first known mineral claims on the site were staked by Joe Bigelow for magnetite. These coincided with a low ridge, parallel and adjacent to tidewater, approximately 1,000 feet north-northwest of the mouth of Twelvemile Creek (Banister, 1962). In 1961 Joe and Esther Bigelow staked the Joyce Ann and Esther E. claims for iron. These were situated on the northwest side of Twelvemile Creek, south of Kane Peak (Alaska Kardex, 117-060). No other claims or prospecting are known in the area.

In 1961 the Bureau of Mines, in connection with an iron resource study of Southeast Alaska, investigated the area for iron (Banister, 1962). There has been no production from the Kane Peak prospect.

Mineral Assessment

The occurrence at Kane Peak is associated with Cretaceous intrusive rocks of the Klukwan-Duke Plutonic Belt (Brew and Morrell, 1983). The ultramafic complex consists of wehrlite, dunite, and clinopyroxenite. Zone boundaries are poorly developed, and the major rock types are gradational (Brew, 197l). The ultramafic body has intruded graywacke and biotite-quartz gneiss and is in turn intruded on the northwest by monzodiorite. According to Kennedy (1946), the central part of the complex is composed of dunite, wehrlite, and diopside pyroxenite. This ultramafic part of the complex is exposed in most of the outcrops on the peak. A band of hornblendite borders the ultramafic body on the north and south sides. Looking northward from a small lake south of Kane Peak, one can see a conspicuous band of brick-red-stained, sulfide-bearing pyroxenite on the peak's south slope. The staining is likely due to oxidation of sulfide minerals that make up only a small proportion of the ultramafic body (Kennedy and Walton, 1946).

Walton (1951) describes "appreciable" amounts of sulfide minerals "sporadically distributed" in the southwestern part of the complex–specifically pyrrhotite, pentlandite, and chalcopyrite. Although no economically significant masses of sulfides were discovered, Kennedy and Walton (1951) suggest that such masses may exist.

The Bureau of Mines examined an area north of Twelvemile Creek near tidewater, but found nothing of economic significance. The work included a magnetometer survey that reportedly indicated subeconomic grades of iron (Banister, 1962). The iron-bearing magnetite bodies in hornblendite that were examined were too small and too low-grade to be of economic interest. A representative sample analyzed for titanium, vanadium, and copper also revealed low values (Banister, 1962).

In the summer of 1998 BLM personnel examined the shoreline exposure of the ultramafic body at Kane Peak and collected six stream sediment and six rock chip samples to evaluate the occurrence (map no. 32.6, samples 392-398, 2810-14). Exposures higher on the peak, especially the stained pyroxenite on the south slope, were not examined in 1998 due to poor weather. However, in 1999 BLM personnel were able to reach the east ridge and collect samples there, from below the outlet of the small lake to the south of the peak and from along the shoreline to the east. Analytical results from samples of the shoreline outcrops and stream sediments showed generally low metal values. However, a stream sediment sample from a drainage on the northeast side of Kane Peak, contained elevated platinum of 124 ppb (map no. 32.5, sample 546). Two samples from a malachite-stained outcrop on the south-facing slope of the east ridge had elevated levels of copper, platinum, and palladium. Sample 2865 (map no. 32.3) contained 1,954 ppm copper, 113 ppb platinum, and 180 ppb palladium. Sample 2866 (map no. 32.3) contained 2,078 ppm copper, 78 ppb platinum, and 83 ppb palladium.

Conclusions

The ultramafic body at Kane Peak is similar to others in Southeast Alaska that have been prospected for iron, chrome, and platinum group elements. To date, no significant quantities of these elements have been found at Kane Peak.

INDIAN POINT

(Plate 1, Map no. 33)

MAS no.:	0021170054	*Quadrangle:*	Petersburg C4
Deposit Type:	Unknown	*Latitude:*	56.8280
Land Status:	Open Federal	*Longitude:*	-133.3557
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Low

Location/Access

The Indian Point occurrence is in the intertidal zone near Indian Point, 14 miles west-southwest of Petersburg. Access to the prospect is by boat.

History

Four lode claims were staked at Indian Point in 1977 by Chromalloy Mining and Minerals (Alaska Kardex, 117-087). This is the same company, also known as Chromalloy American, that owned and operated the Castle Island barite mine for several years (map no. 35). The claims were apparently active for only one year (Alaska Kardex, 117-087). No other published reference to the site is known.

Mineral Assessment

The Indian Point prospect is hosted in Mesozoic phyllite and slate near its contact with Mesozoic gabbro (Brew, 1997j).

The BLM's examination revealed a 0.15-foot-thick, silicified pyrite band conformably hosted in sericite schist. Foliation in the schist strikes 350° and dips 32° to the east. The band is exposed through beach gravel in the intertidal zone for approximately 10 feet. Samples collected from the band contained up to 187 ppb gold (map no. 33.1, samples 50, 224).

Conclusions

The sulfide occurrence at Indian Point is of very limited extent and contains low base and precious metal values. As a consequence, this occurrence is unlikely to attract mineral exploration interest.

WEST DUNCAN

(Plate 1, Map no. 34)

MAS no.:	0021170191	*Quadrangle:*	Petersburg, C4
Deposit Type:	VMS: Zn, Ag, Pb	*Latitude:*	56.6721
Land Status:	Open Federal	*Longitude:*	-133.2582
Development:	Soil grids, pit	*MDP:*	Low
BLM work:	Sampled	*MEP:*	High
Alternate name: Go, Halobia			

Location/Access

The West Duncan prospect is on the west side of Duncan Canal 16 miles southwest of Petersburg. Situated near the intertidal zone at the mouth of a creek 2 miles north of Castle River, West Duncan is accessible by helicopter, float plane, or boat; however, float plane and boat access are inhibited by tidal mud flats that extend for over a mile (photo 11).

History

Grybeck and others (1984) first described mineralized rock at the West Duncan prospect, but they called it the "Castle River." The same location was called the "Halobia" in 1998 (Grybeck and Berg, 1998). Pacific Alaska Resources Co. has a large block of claims covering the West Duncan prospect that they called the "Go" prospect. This company had a plan of operations filed with the Forest Service to drill up to 12 holes during 1998 and again in 1999. These plans were not carried out.

Mineral Assessment

The West Duncan prospect is hosted in Mesozoic phyllite and slate (Brew, 1997). The rocks at this site are almost certainly Triassic Hyd Group strata (Grybeck and Berg, 1998).

USGS investigators describe upper Triassic phyllite hosting zones, 9 to 12 feet wide by 90 to 120 feet long, containing lenses of massive sulfides up to 0.75 feet wide and 3 feet long. Grab samples from these sulfide lenses contained up to 100 ppm copper, 100 ppm silver, and 1,000 ppm arsenic (Grybeck and others, 1984; Grybeck and Berg, 1998).

Pacific Alaska Resources Co. prospected the area during the late 1980's and 1990's. During 1998 and 1999 they had a plan to place 12 diamond drill holes at locations from 1 to 1.5 miles to the east of the tidewater location at elevations from 300 to 700 feet. A brief company report (DeLancey, 1990) and written communication with Barry Hoffman (1999) of Pacific Alaska Resources Co. indicated significant geochemical anomalies in copper, lead, zinc, and silver near the planned drill hole locations. BLM stream sediment and soil samples collected in the vicinity of the proposed diamond drill holes contained up to 548 ppm zinc. For a detailed report on this sampling see Anomalous Area 6 in Bittenbender and others (2001).

The BLM's examination of the West Duncan prospect revealed bands of disseminated to massive sulfides up to 1.5 feet thick hosted in carbonaceous and silicified phyllite. These bands strike approximately east-west; dip 50° to the south; conform to foliation in the phyllite; and contain pyrite, sphalerite, and galena. They are exposed across the creek bed for distances of up to 40 feet. Cover obscures the bands on either side of the creek. Samples across the bands contained up to 30.8 ppm silver, 5,400 ppm lead, and 5.4 percent zinc (map no. 34.1, samples 2622, 9645).

Conclusions

The West Duncan prospect is Triassic in age and is characteristic of VMS deposits in the Duncan Canal area. These factors and the anomalies defined by Pacific Alaska Resources Co. and the BLM make the area an attractive exploration target.

Photo 11. Extensive tide flats at some locations in Duncan Canal can complicate access. The depth of water between the geologist and the boat averages less than one foot. Photo by J. Still.

KUPREANOF PYRITE

(Plate 1, Map no. 35)

MAS no.:	0021170038	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Zn, Ag, Pb	*Latitude:*	56.4737
Land Status:	State,Open Federal	*Longitude:*	-132.0954
Development:	Soil grids, pit	*MDP:*	Low
BLM work:	Sampled	*MEP:*	High
Alternate name: Go			

Location/Access

The Kupreanof Pyrite prospect is in the intertidal zone on the west side of Duncan Canal, 1.3 miles north of Castle River. It is 16 miles southwest of Petersburg. The intertidal area is covered with beach grass and kelp. Farther inland, brush, timber, and second-growth timber cover the gently to moderately sloping topography. Access is possible by boat, float plane, or helicopter; however, over a mile of tidal mud flats can cause problems for access by boat and float plane.

History

In 1921 Buddington (1923) noted a 4-foot-thick by 50-foot-long pyrite zone exposed near the high-tide line at the Kupreanof Pyrite prospect. Grybeck and others (1984) describe a similar zone. Pacific Alaska Resources Co. has a large block of claims covering the Kupraenof Pyrite prospect that they called the “Go” prospect. This company had a plan of operations filed with the Forest Service to drill up to 12 holes during 1998 and again in 1999. These plans were not carried out.

Mineral Assessment

The Kupreanof Pyrite prospect is hosted in Mesozoic phyllite and slate (Brew, 1997j). The rocks at this site are almost certainly Triassic Hyd Group strata (Grybeck and Berg, 1998).

Grybeck and others (1984) describe a 1 mile long zone of felsic metatuff that locally contains massive layers of pyrite at this location. Grab samples from massive sulfide zones up to several meters thick contained up to10 ppm silver, 700 ppm lead, and 350 ppm zinc (Grybeck and others, 1984).

Pacific Alaska Resources Co. prospected the area during the late 1980's and 1990's. During 1998 and 1999 they had a plan to place 12 diamond drill holes at locations from 1 to 1.5 miles to the east of the tidewater location at elevations from 300 to 700 feet. A brief company report (DeLancey, 1990) and a conversation with Barry Hoffman (oral commun., 1999) of Pacific Alaska Resources Co. indicated significant geochemical anomalies in copper, lead, zinc and silver near the planned drill hole locations. BLM stream sediment and soil samples collected in the vicinity of the proposed diamond drill holes contained up to 548 ppm zinc. For a detailed report on this sampling see Anomalous Area 6 in Bittenbender and others (2001).

The BLM's examination of the Kupreanof Pyrite prospect revealed two lenses of pyrite approximately 6 feet thick that are exposed through kelp and sea grass near the high-tide line. Both lenses are conformably hosted in silicified phyllite and schist, the foliation of which strikes 035° and dips 42° to 65° to the southeast. The lenses are separated by approximately 300 feet and align approximately along strike. A zone of disseminated pyrite extends between the lenses. Small amounts of sphalerite are found with the pyrite. Two 6-foot chip samples across the widest parts of the sulfide lenses contained up to 31.8 ppm silver, 1,304 ppm lead, 1.7 percent zinc, and 1,268 ppm arsenic (map no. 35.1, samples 278, 9646).

Conclusions

The Kupreanof Pyrite occurrence is likely Triassic in age and is characteristic of VMS deposits in the Duncan Canal area. These factors and the anomalies defined by Pacific Alaska Resources Co. and the BLM make the area an attractive exploration target.

CASTLE ISLAND MINE

(Plate 1, Map no. 36)

MAS no.:	0021170002	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Ba	*Latitude:*	56.6522
Land Status:	Private, State	*Longitude:*	-133.1675
Development:	Mine	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Castle Island Mine is on a small island in Duncan Canal, 0.1 mile south of Big Castle Island and 14 miles southwest of Petersburg. The island is covered by a patented mining claim. The topography of the island is one of moderate relief, and the landscape is covered with thick brush. Access to the prospect is by boat, float plane, or helicopter.

History

The USGS noted the presence of barite on the Castle Islands in 1913 (Burchard, 1914). Recognizing the potential importance of associated base metals and gold, the Alaska Treadwell Gold Mining Co. staked the deposit in 1913. The claim was patented in 1929 (MS1452) as the Red Cliff Lode and subsequently sold to the Alaska Juneau Mining Co., which drilled the deposit for its barite and gold content in 1931. The gold and silver assays were low (Carnes, 1980; Williams and Decker, 1932).

In 1966 the Alaska Barite Co. acquired claims at Castle Island and started mining an outcrop on the northeast end of the island. Between 1966 and 1969, the company mined 234,000 tons of barite from above the high-tide line (Carnes, 1980; photo 12). In 1969 Inlet Oil Corporation acquired the claims and proceeded to mine barite below tidewater. In 1975 the company declared bankruptcy, and the mine was purchased by Chromalloy American. From 1970 to 1980, the companies mined 552,888 tons of barite from an underwater, openpit operation. Drilling and blasting liberated the ore, which was recovered by a clamshell crane (Carnes, 1980). In 1980, with economic reserves exhausted, the mine closed, and by the next year, the mill and most of the camp were removed (R.D. Carnes, oral commun., 1995). By 1996 all mining equipment and signs of habitation had been removed from the island. The site is now overgrown with alder and brush.

Mineral Assessment

The Castle Island Mine is located in Upper Triassic Hyd Group rocks that are in contact with Devonian limestone and Quaternary basalt (Karl and others, 1999). Berg and Grybeck (1980) describe the deposit as a dismembered VMS deposit.

The Castle Island barite lens occupies a small syncline and has a strike of 330° and a dip of 60° to the northeast. Its hanging wall consists of limestone and gray schist. The limestone is mostly massive, with abundant veinlets of white calcite. The gray schist is finely foliated with scattered veinlets of white calcite and abundant lenses of black chert. In places, there is an abundance of conformable, fine-grained sulfides in thin layers. The footwall consists of graphite-carbonate schist that contains abundant lenses of white calcite and quartz and conformable, thin sulfide layers. The sulfides are pyrite, sphalerite, galena, chalcopyrite, and tetrahedrite. The barite is intercalated with the host rocks along both the hanging wall and footwall (Wiese, 1977; Carnes, 1980; Williams and Decker, 1932; Burchard, 1914; Kazda, 1972; Berg and Grybeck, 1980). R.D. Carnes (oral commun., 1999) estimates that the interbedded barite and schist constitute several million tons of mineralized, low-grade rock.

Most of the Castle Island barite lens has been mined. It was 300 feet long and 200 feet wide and extended from 35 feet above sea level to 130 feet below. The barite ore was massive, gray to white and 90 percent pure. It contained 5 percent silica and 2 to 4 percent sulfides consisting of pyrite, pyrrhotite, sphalerite, galena, bornite, chalcopyrite, and tetrahedrite. Small amounts of magnetite, ilmenite, pyrolusite, and quartz were also present (Carnes, 1980; Williams and Decker, 1932; Burchard, 1914). Prior to mining, an analysis of the barite ore included 0.006 oz/t gold, 1.2 oz/t silver, 0.05 percent copper, 0.60 percent lead, and 1.80 percent zinc (Williams and Decker, 1932). A more recent analysis returned 0.01 ppm gold, 1.05 ppm silver, 0.04 percent copper, and 1.38 percent zinc (Carnes, 1980).

By 1980 the deposit had been mined to a depth of approximately 90 feet below sea level. Carnes (oral commun., 1999) estimates that several irregularly shaped barite lenses at a depth of 60 feet below sea level are located to the north of the main ore body and that detrital barite material is lying offshore of the main lodes. In 1977 he inferred 390,000 tons of low-grade barite resources at a grade of 85 percent $BaSO_4$ and 315,000 tons of higher-grade barite resources (Carnes, 1980). Holdsworth (1980), at the request of Chromalloy American, estimated 69,600 tons of ore-grade material in 1980. (From 1977 to 1980, 35,000 tons of barite were mined from the Castle Island Mine.)

The BLM’s examination consisted of sampling waste dumps on the small island where the mill was located. The dumps consist of barite with disseminated sulfides, barite with bands of sulfides, and grey schist with bands of barite and sulfides. Samples from these rocks contained up to 347 ppb gold, 151.0 ppm silver, 518 ppm copper, 7,783 ppm lead, 2.3 percent zinc, and greater than 2 percent barium (map no. 36.1, samples 42-43, 46).

Conclusions

The Castle Island Mine was exhausted of economic reserves in 1980. Some underwater barite resources remain according to Carnes (1980) and Holdsworth (1980).

Photo 12. Conveyors loading barite on a barge at the Castle Island Mine. This photograph was taken in about 1968 when barite was still being mined from the surface. Photo from BLM archive.

RUBBLE

(Plate 1, Map no. 37)

MAS no.:	0021170176	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Zn	*Latitude:*	56.6609
Land Status:	Open Federal	*Longitude:*	-133.0940
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Rubble occurrence is on the northeast side of Duncan Canal, east-southeast of the Castle Islands and 12 miles southwest of Petersburg. Historic claims in the area extend from the shoreline inland to approximately the crest of the ridge that is parallel to Duncan Canal, at elevations of 1,500 to 2,000 feet. The claim block extends approximately 2 miles along the shoreline and inland 1¼ miles. Access to the area is easily accomplished by boat, float plane, or helicopter.

History

There are no published accounts of mineral occurrences or mineral activity in the Rubble area. BLM personnel discovered mineralized rock in the area while following up several sources of information. The area was investigated in a reconnaissance fashion by Amoco Minerals Co. geologists in the late 1970's (Amoco Minerals Company, 1979). Atna Resources, Ltd. (also known as Quail Hill Mining Co.?) from Vancouver, Canada staked a block of 70 claims called the Rubble claims in 1985. The company abandoned the claims in 1988 (Bureau of Land Management, ALIS; Petersburg Recording Office, book 25, page 737).

The East Duncan Pyrite occurrence (map no. 38) is within the area described herein as the Rubble occurrence. The location of the pyrite occurrence was mentioned to the BLM by USGS investigators (see Junior Creek; Taylor, in press). A petrographic report in the BLM files also contains a mention of pyrite-bearing rock exposed along a logging road on the east side of Duncan Canal (Bureau of Land Management, MAS). No other reference to the Rubble occurrence is known to exist in published literature.

Mineral Assessment

The rocks along the east side of Duncan Canal in the area of the historic Rubble claims are mapped as Triassic Hyd Group argillite and undifferentiated sedimentary and volcanic rocks in fault contact with Permian and Mississippian Cannery Formation sedimentary and volcanic rocks. Southwest-directed thrust faults imbricate slivers of these units parallel to the shoreline (Karl and others, 1999).

The Rubble claims area was investigated by BLM personnel along the shoreline, where Amoco geologists reported finding mineralized rock, inland where a strong conductive geophysical anomaly is located, and near the East Duncan Pyrite occurrence. The investigation near the latter is described in the East Duncan Pyrite write-up (map no. 38).

The rocks along the shoreline are mapped generally as Triassic argillite (Karl and others, 1999) and consist predominantly of slate with apparent interbeds of quartz-sericite schist, calcite-chlorite schist, and chert. The slate and schist layers may be several to hundreds of feet thick. Along some contacts, the slate and schist are interlayered on an inch scale. Generally, the foliation in the schist and slate is parallel to the beds, but in places, they are at a high angle to each other. Fold hinges in the slate in places show evidence of tight to isoclinal folding.

The quartz-sericite schist and chert in the Rubble area may be an alteration product of the more mafic calcite-chlorite schist. The alteration may have consisted of silicification and sericitization along with pyritization. Alternatively, the two rock types may indicate different phases of volcanic activity, and the pyrite may be primary. The calcite-chlorite schist appears to be similar to the rock that hosts the targets that Kennecott drilled in the Taylor Creek area (map no. 31) in 2000.

The schist commonly contains disseminated, banded/layered, and/or lenses of pyrite. Analytical results indicate the presence of approximately 1 to 2 percent barite. The slate in places contains pyrite as well, commonly in thin seams parallel to foliation and also in elongate, sheath-like nodules up to 1 inch by ½ inch by 18 inches long. Generally the schist contains more pyrite than slate. Most of the rock chip samples collected by the BLM indicate pyrite as the only base metal sulfide phase present. However, elsewhere in the Rubble area quartz segregations in greenstone contain minor chalcopyrite along with pyrhhotite. The BLM's follow-up of the conductive anomaly in the area also revealed other base metals in stream sediment samples.

In one place mineralized rock is exposed in shoreline cliffs that rise to approximately 40 or 50 feet above sea level and extend along the beach for at least 100 feet. The mineralized rock here consists of quartz-sericite schist and chert with ubiquitous pyrite to approximately 2 to 3 percent. In places the pyrite makes up 20 to 30 percent of the rock. The pyrite is commonly disseminated, but also occurs in thin (up to ¼-inch, but commonly less than ⅛-inch) bands in both the chert and schist. The pyrite is both medium grained and euhedral and also fine to very fine grained. Representative samples of the mineralized rock (map nos. 37.1, 37.2, samples 3921, 8801) indicate that pyrite is the only sulfide phase.

Elsewhere along the shoreline, BLM personnel found mineralized quartz-chlorite-sericite schist with bedded pyrite (map no. 37.1, sample 3938). A 20- to 30-foot strike length of mineralized schist includes a layer of approximately 80 percent pyrite, 1 foot thick. The mineralized section may be longer, but it is obscured by cover along strike. The immediate structural footwall to the pyrite layer is approximately ½ foot of slate. Otherwise, the pyrite layer is hosted in a 5-foot bed of schist within a larger slate unit. In places, the mineralized schist includes smaller massive pyrite layers with coarsely crystalline calcite. The slate in the footwall to the mineralized schist includes up to ¼-inch layers of medium- to coarse-grained pyrite parallel to the slate foliation.

BLM investigators found lenses of pyrite in calcareous chlorite schist along the shoreline. The chlorite schist commonly contains light to dark gray, rounded "eyes" of calcite. The schist also contains disseminated pyrite and pyrite in ¼- to ½-inch layers parallel to foliation. One such exposure extends along the intertidal zone for approximately 200 feet and is approximately 100 feet wide. BLM investigators collected samples across the lenses in this mineralized section. The lenses are up to 6 feet long and 1½ feet wide (map no. 37.2, samples 3940-42, 8808-10).

BLM investigators collected stream sediment and soil samples from along the shoreline of the Rubble area and inland, mainly from along the southeastern part of the historic claim block. These samples were collected while following up a strong conductive geophysical anomaly distinguished by the Stikine airborne geophysical survey that was flown in 1997 (ADGGS and others, 1997). Analytical results from the stream sediment sampling indicate the presence of anomalous amounts of copper, barium, zinc, and molybdenum, along with minor amounts of silver, chromium, cobalt, manganese, and arsenic (Bittenbender and others, 2001). The barium, zinc, and molybdenum anomalies are generally concentrated near the shoreline of the Rubble area, whereas the copper anomalies were generally detected in samples from creeks that drain the area to the east.

Rock outcrops in the area of the conductive anomaly are generally restricted to stream cuts. The country rock in the area is predominantly slate to phyllite, commonly graphitic, fine-grained, silvery gray to black, and well foliated. The slate and phyllite is interlayered with chlorite schist, calcareous chlorite schist, quartz-sericite schist, graywacke, and limestone. Interlayering is on a scale of several to hundreds of feet. Pyrite is the predominant sulfide phase and is concentrated in the quartz-sericite schist. It occurs disseminated and in layers, seams, and knots. Layers of massive pyrite are only up to several inches in thickness. Pyrrhotite is common in some places. Sphalerite, galena, and minor chalcopyrite in ½-inch veins in the quartz-rich part of a phyllite to slate host was sampled in one place (map no. 37.5, sample 6288). The sulfides at this location may have been concentrated along a northeast-trending fault. Farther downstream, BLM personnel found light green (fuchsite) schist in discontinuous layers or lenses hosted in intensely deformed graphitic slate or phyllite. The slate/phyllite is commonly iron-stained and gossanous in places. Pyrite is disseminated in both the slate/phyllite and fuchsite schist. Nearby, boulders with 30 to 50 percent barite and/or witherite lie in the creek bed (map no. 37.7, sample 900).

Conclusions

The Rubble area is situated in rocks that only recently have been mapped as Triassic Hyd Group, which are known to host VMS deposits elsewhere in the Duncan Canal area (Karl and others, 1999; Bittenbender and others, 2001) and are part of an extensive belt of Triassic rocks that host VMS deposits across Southeast Alaska (Taylor, 1997; Taylor and others, 1995, 1999; Newberry and others, 1997). The airborne geophysical survey of the area in 1997 (ADGGS and others, 1997) defined conductive geophysical anomalies in the area that the geophysical contractor interpreted as being possible sulfide bedrock responses (Pritchard, 1997). During the BLM follow-up of the geophysical survey, the analytical results from stream sediment samples indicated the presence of geochemical anomalies in the Rubble area (Bittenbender and others, 2001). Even though the BLM's rock chip sampling revealed pyrite as the main sulfide phase, the geochemical anomalies suggest additional base metal mineralized rock may be present. The permissive geology in the Rubble area, along with the presence of conductive geophysical anomalies and anomalous geochemistry, make the area attractive for hosting mineral occurrences and a likely target for future exploration.

EAST DUNCAN PYRITE

(Plate 1, Map no. 38)

MAS no.:	0021170177	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS	*Latitude:*	56.4906
Land Status:	Open Federal	*Longitude:*	-132.0284
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The East Duncan Pyrite occurrence is exposed along a logging road on the east side of Duncan Canal, opposite Big Castle Island. The logging road is part of the Lindenberg Peninsula road network, which is accessed from a pier at a site called "Tonka," on the west side of Wrangell Narrows. The occurrence is located 12 miles southwest of Petersburg. The area has moderately steep topography and is covered for the most part by conifer forest, except in places where clear-cutting has occurred. The site can also be reached by helicopter or by taking a boat to Duncan Canal and then continuing on foot.

History

The location of a pyrite occurrence on the east side of Duncan Canal was mentioned to the BLM by USGS investigators. A petrographic report in the BLM files (Bureau of Land Management, MAS) also contains a mention of pyrite-bearing rock exposed along a logging road on the east side of Duncan Canal. No other reference is known to exist in published literature.

Mineral Assessment

The East Duncan Pyrite occurrence is near the boundary between the Alexander terrane to the west and the Gravina Belt overlap sequence to the east (Silberling and others, 1994). Recent follow-up of airborne geophysical data (ADGGS, 1997a-m) from the Duncan Canal area by the USGS is likely to move the Alexander-Gravina contact farther to the east than previously thought (S.M. Karl, oral commun., 1998). Therefore, the East Duncan Pyrite prospect would lie in Alexander terrane rocks, within Brew and others (1984) "Duncan Canal/Zarembo Island/Screen Island" sub-belt that hosts VMS deposits in the area. The unit hosting the pyrite has been mapped as undifferentiated Mesozoic phyllite and slate (Brew and others, 1984; Brew, 1997).

Medium to dark gray slate hosts the pyrite at the East Duncan Pyrite occurrence. The pyrite is medium- to fine-grained and occurs in layers, knots, and lenses that are generally parallel to foliation in the hosting slate. No sulfides other than pyrite were noted. The pyrite-rich zone is 3 feet thick and exposed for 10 feet along strike, beyond which it is covered by dirt and vegetation. Foliation in the slate strikes north to northwest and dips moderately to the northeast. There is a sharp contact between the pyrite-rich zone and unmineralized slate in the footwall; foliation in the slate across this contact varies noticeably, indicating a possible fault. Above the footwall, the slate is more silicified, particularly where the pyrite is concentrated. The contact between the pyrite-rich zone and the slate in the hanging wall is gradational.

BLM personnel collected three measured samples from the East Duncan Pyrite occurrence. They contained low precious and base metal values. The highest gold value was 9 ppb, highest silver was 2 ppm, highest copper was 98 ppm, and highest zinc was 244 ppm. Each of the samples contained approximately 0.5 percent barium and had elevated values of nickel at 204 to 332 ppm, and chromium at 113 to 122 ppm (map no. 39.1, samples 2862, 3817-18).

Conclusions

The mineralized rock at the East Duncan Pyrite prospect is limited in extent and has low metal concentrations. It is interesting, however, because it may be related to other VMS occurrences in the area. This would be the first indication of VMS-type mineralization on the east side of Duncan Canal. Additional examination of the east side of Duncan Canal may be undertaken, given the potential for VMS mineralization.

SPRUCE CREEK

(Plate 1, Map no. 39)

MAS no.:	0021170190	*Quadrangle:*	Petersburg, C4
Deposit Type:	PR, VMS?: Zn, Ag, Pb	*Latitude:*	56.6640
Land Status:	Open Federal	*Longitude:*	-133.0289
Development:	2 (?) DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Spruce Creek prospect is on Lindenberg Peninsula near Forest Service road 6352, 10 miles south-southwest of Petersburg. The topography of the area ranges from gently sloping to moderately steep with elevations ranging from 400 to 1,000 feet. Vegetation consists of muskegs, dense brush, thick timber, and clear-cuts. Access to the prospect is by helicopter or by vehicle. It is a 6-mile drive from the Tonka pier on the west side of Wrangell Narrows, which is 6 miles south of Petersburg.

History

Paul Pieper of Petersburg discovered and staked the Spruce Creek prospect in 1983. In 1992 Westmin Resources, Ltd. (Westmin) optioned the property and performed geophysical surveys along with mapping and soil sampling. Westmin dropped the property in 1993. Results of their work have not been made public. Paul Pieper (oral commun., 1998) drilled several shallow, small-diameter holes on the property. He currently holds 10 claims covering the prospect.

Mineral Assessment

The Spruce Creek prospect is hosted in Upper Cretaceous phyllite according to Brew (1997). Revised mapping in 1998 indicates the country rock in the area consists of Permian and Mississippian rocks of the Cannery Formation in fault contact with Triassic Hyd Group volcanic and sedimentary rocks (Karl and others, 1999). The rocks trend west to northwest and dip steeply to the east.

The BLM's examination revealed three areas of sulfide mineralization: (1) on the west side of Forest Service road 6352 near a borrow pit, at an elevation of 580 feet (map no. 39.1); (2) 2,500 feet east-southeast of the borrow pit below a waterfall, at an elevation of 480 feet (map no. 39.2); and (3) 7,500 feet southeast of the borrow pit in a clear-cut (map no. 39.3).

The mineralized rock near the borrow pit consists of a 0.3-foot-thick quartz vein with sericite and chlorite conformably hosted in greenstone schist. The vein is exposed for several feet in a road cut, but beyond that is covered. It strikes to the northwest and dips steeply to the northeast. Pyrite, galena, and sphalerite are found in the quartz and along partings in the schist. A sample across the vein contained 213 ppb gold, 1,690 ppm lead, and 4,163 ppm zinc (map no. 39.1, sample 351). A 19-foot diamond drill hole was collared at this location in 1996 (P. Pieper, oral commun., 1998).

The mineralized rock near the waterfall is exposed on a steep face on the north side of the small creek that forms the waterfall. The exposure consists of gray bands of fine sulfides hosted in limestone with bedding that trends northwest and dips steeply to the northeast. A 1.4-foot sample across the sulfide bands contained 416 ppb gold, 14.9 ppm silver, 820 ppm lead, and 5,221 ppm zinc (map no. 39.2, sample 407). Thirteen additional samples in this area contained no significant metal values (map no. 39.2, samples 408-412, 2823-30).

The mineralized rock in the clear-cut consists of a 4-foot-thick bed of marble hosted in greenstone that has been exposed by a cut. The marble strikes 300° and dips 55° to the north. A 0.4-foot band of the marble contains sphalerite and galena. A sample across this band contained 779 ppb gold, 59.1 ppm silver, 5.6 percent lead, and 2.1 percent zinc (map no. 39.3, sample 421).

Conclusions

The three mineralized areas exposed on the Spruce Creek prospect are too small to attract development. Mapping in 1998 indicates that at least parts of the prospect are in Triassic rock (Karl and others, 1999), which hosts prospective deposits elsewhere in the Duncan Canal area. There is little rock exposed at the prospect, so much of it remains unexplored. Soil sampling and follow-up geophysics may point to more significant mineralized zones.

NICIRQUE

(Plate 1, Map no. 40)

MAS no.:	0021170185	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS?: Zn	*Latitude:*	56.3871
Land Status:	Open Federal	*Longitude:*	-131.3870
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*	Low

Location/Access

The Nicirque prospect is at an elevation of 2,300 feet, approximately 3 miles north-northeast of Pearl Island on the south side of Lindenberg Peninsula. It is 11 miles south-southwest of Petersburg. The topographic relief in the area is moderate. It is covered with muskegs, dense brush, thick timber, and clear-cut areas. Access to the prospect is easiest by helicopter. Alternate access is by a combination of boat, vehicle, and foot (requiring a 6-mile drive from the Tonka pier, which is 6 miles south of Petersburg on Wrangell Narrows, and then a hike to the prospect).

History

Paul Pieper of Petersburg discovered, named, and staked this prospect in 1983 (oral commun., 1998). There is no known mention of it in published literature.

Mineral Assessment

The Nicirque prospect is hosted in Permian and Mississippian rocks of the Cannery Formation that are in fault contact with Triassic Hyd Group volcanic and sedimentary rocks (Karl and others, 1999). The owner reports a Triassic fossil location on this prospect (P. Pieper, oral commun., 1998), so the mapped boundary between the Cannery and Hyd Group rocks may be subject to change.

The mineralized rock at the prospect is reportedly a massive pyrite vein in a breccia zone (P. Pieper, written commun., 1998). The BLM's investigation was confined to collecting a 3.5-foot, representative chip sample of slate with pyrite bands near the reported location of the fossils. The sample contained 56 ppb gold, 2.6 ppm silver, and 333 ppm zinc (map no. 40.1, sample 465).

Conclusions

There is insufficient mineralization to attract exploration of this prospect.

SOUTHWEST DUNCAN

(Plate 1, Map no. 41)

MAS no.:	0021170189	*Quadrangle:*	Petersburg, C4
Deposit Type:	VMS: Au, Cu	*Latitude:*	56.5653
Land Status:	Open Federal	*Longitude:*	-133.0993
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*	Low

Location/Access

The Southwest Duncan prospect is at a borrow pit near sea level on the west side of Duncan Canal, south of Little Duncan Bay. It is 18 miles south-southwest of Petersburg. Thick brush predominates in the area. Access to the prospect is by boat or helicopter.

History

Field maps generated during Amoco Minerals Co.'s 1978 to1979 investigation of the Duncan Canal area indicate copper in a borrow pit at the Southwest Duncan prospect (Zelinski, 1979?). There is no mention of this site in published literature.

Mineral Assessment

The prospect is hosted in Mesozoic greenstone and greenschist (Brew, 1997). Karl and others (1999) consider these rocks to be part of the Triassic Hyd Group.

The BLM's examination of the borrow pit and the shoreline in the Southwest Duncan area revealed greenstone containing small amounts of disseminated pyrite and chalcopyrite. Grab samples of rubblecrop from the more mineralized areas contained from 15 to 821 ppb gold, 954 to 1,189 ppm copper, and 21 to 1,906 ppm arsenic (map no. 41.1, samples 188-189, 9634-35).

Conclusions

The Southwest Duncan prospect is hosted by Triassic Hyd Group rocks that elsewhere in the Duncan Canal area host prospective VMS deposits. The combination of gold, copper, and arsenic in the greenstone, along with the Triassic age makes the property interesting; however, the occurrences are not of sufficient size to attract exploration.

TB

(Plate 1, Map no. 42)

MAS no.:	0021170129	*Quadrangle:*	Petersburg C5
Deposit Type:	Unknown	*Latitude:*	56.5245
Land Status:	Open Federal	*Longitude:*	-133.5400
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The TB prospect is 3 miles northwest of Totem Bay on the south side of Kupreanof Island. It is approximately 30 miles southwest of Petersburg. Timber, muskeg, and thick brush predominate in the area. Access to the prospect is by helicopter.

History

A large block of claims was staked in the area in 1973 (Alaska Kardex, 117-089), presumably by Resource Associates of Alaska (Bureau of Land Management, MAS). The USGS reports vivid exposures of orange-yellow altered rhyolite in the area, which is indicative of a large, felsic, hydrothermal system (Grybeck and Berg, 1998).

Mineral Assessment

The TB prospect is hosted in a thick sequence of Quaternary-Tertiary rhyolite (Brew, 1997). The USGS reports locally disseminated pyrite, but no evidence of other ore minerals (Grybeck and Berg, 1998).

The BLM's investigation was confined to a few landings in order to examine rusty, red-yellow rhyolite that extends for many miles in the area. In places, the rhyolite contains numerous quartz vugs, chalcedony, and green and red jasper. A grab sample of silicified, brecciated, pyrite-bearing rhyolite contained 425 ppm zinc (map no. 42.2, sample 2626).

Conclusion

There is insufficient information about the TB prospect to reach a definitive conclusion about its mineral potential. Although no evidence of ore minerals has been found yet, the extent of the intensely stained altered zone may encourage some further exploration of the area.

MONONGEHELA
(Plate 1, Map no. 43)

MAS no.:	0021170047	*Quadrangle:*	Petersburg B5
Deposit Type:	Unknown: U_3O_8, REE?	*Latitude:*	56.1448
Land Status:	Open Federal	*Longitude:*	-132.5855
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access
The Monongehela claims are on the west side of Little Totem Bay on the south side of Kupreanof Island. They are 31 miles southwest of Petersburg. Thick brush and heavy timber predominate in the area. Access to the prospect is by boat.

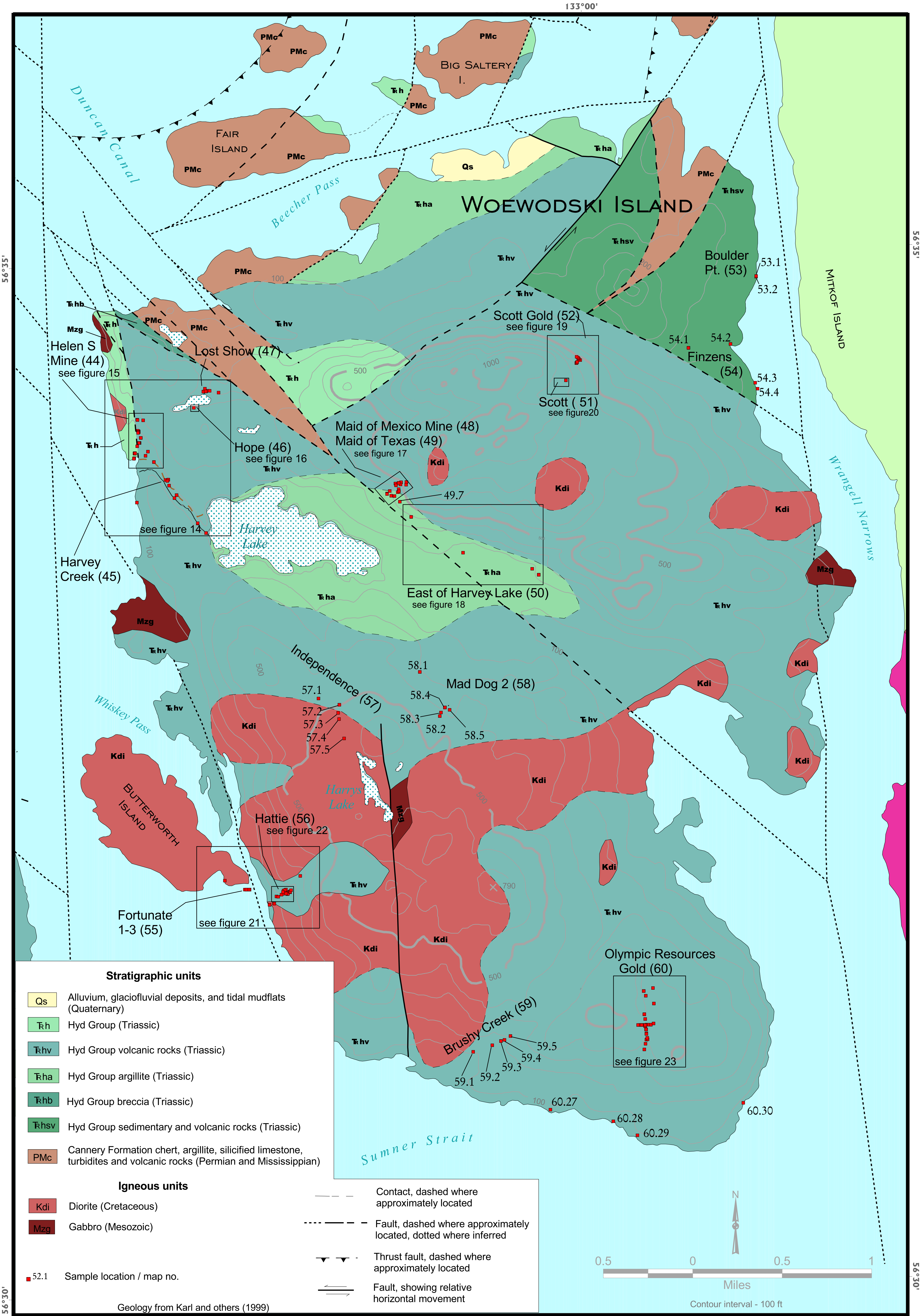
History
The Totem Bay area was examined in 1952 by Houston and others (1958) to determine if radioactive veins similar to those found on northern Prince of Wales Island extend farther north onto Kupreanof Island; no such veins were found. Nonetheless, nine claims were later staked in the Little Totem Bay area in 1955 that reportedly covered a radioactive mineral potential (Alaska Kardex, 117-018), but no subsequent activity has been reported.

Mineral Assessment
The Monongehela prospect is hosted in Quaternary-Tertiary rhyolite (Brew, 1997g). These volcanic rocks are part of a large package of Quaternary and Tertiary, predominantly extrusive, igneous rocks that cover the southwest part of Kupreanof Island (Brew and others, 1984).

Houston and others (1958) mention finding 0.003 percent equivalent uranium in andesite on the west shore of Little Totem Bay in 1952. BLM scintillometer surveys of the same area revealed a 3-foot by 3-foot zone of rhyolite at the tide line that is approximately 60 percent above background radiation. A sample across this zone contained 7 ppm uranium, 17 ppm thorium, 43 ppm neodymium, 38 ppm lanthanum, and 110 ppm cerium (map no. 43.1, sample 181).

Conclusions
The low uranium/rare-earth values at Little Totem Bay do not encourage exploration for such deposits in the area.

WOEWODSKI ISLAND



Projection: UTM, NAD27, zone 8
Source / date of data:
Sample locations - JMIC / 1996-2000
Contour lines - USGS separates (modified by JMIC) / approx 1950s -1980s
Base map - DNR, BLM (modified by JMIC) / approx 1950s - 1980s
Date of map: 3/2002

Figure 13. Map of Woewodski Island, showing prospects and geology.

The information depicted on this map should be used for graphic display only. No warranty is made by BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

HELEN S MINE

(Figures 14, 15, Map no. 44)

MAS no.:	0021170014	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au; VMS: Zn, Ag, Pb	*Latitude:*	56.5722
Land Status:	Private	*Longitude:*	-133.0588
Development:	2 shafts, pits, trenches, mill	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Helen S Mine is on the northwest side of Woewodski Island, 17 miles south-southwest of Petersburg. The mine is on patented mining claims (MS 614) that extend from tide water to an elevation of 300 feet. The topography is gently sloping. Brush, old-growth, and second-growth timber cover the claims. Access to the property can be gained by boat, float plane, or helicopter. Trails lead from the beach to the mine workings. A private cabin is located on the beach in the southwest corner of the claims.

History

The Helen S claim group was first staked in 1902 by the Olympic Mining Co. (Wright and Wright, 1908). These claims, staked on gold-bearing quartz veins 5 to 15 feet thick, were surveyed for patent in 1904 (Wright and Wright, 1905). In about 1904 a 20-stamp mill was installed. It operated until 1905 (Wright and Wright, 1908; Roppel, 2001). By 1907 improvements to the claims included the 20-stamp mill, a 100-foot shaft, another shaft 400 feet to the north, 650 feet of drifts and crosscuts, and several opencuts. A small test run had also been processed in the mill, and the gold values were reported as principally confined in the concentrate (Wright and Wright, 1908). Shortly after 1915, the surface improvements were dismantled, and the property was abandoned (Berg and Cobb, 1967). In 1945 J.C. Roehm examined the property for the Alaska Territorial Department of Mines. He reported vegetation covering most of the mineralized areas. He also reported the ore that was milled averaged $3.66 per ton (gold at $35/oz). A sample collected from pyritized schist assayed 0.06 oz/t gold and 0.2 oz/t silver (Roehm, 1945).

Mineral Assessment

The Helen S Mine is in the Upper Triassic Hyd Group (Karl and others, 1999) and consists of felsic and intermediate volcanic flows and breccias, limestone, and argillite. On the northwestern part of the property, hornblende diorite intrudes the volcanic flows (Brew, 1997j).

The gold-bearing veins at the Helen S Mine are hosted in greenstone schist. The schistosity of the metavolcanic rocks strikes north-south and dips 70° to the east. The quartz veins strike northeast, dip vertically, and contain galena, pyrite, and sphalerite (Wright and Wright, 1905). A disseminated lode approximately 40 feet wide and at least 1,000 feet long (Berg and Cobb, 1967) strikes north-south and dips 50° to the east. This is described as the principal deposit. It consists of a belt of schist that is mineralized with quartz-calcite stringers and small masses and disseminations of pyrite, galena, and sphalerite. A shaft was reportedly sunk on this zone (Wright and Wright, 1908; Berg and Cobb, 1967). Historic references regarding the development and production from the Helen S Mine are confused with the nearby Maid of Mexico Mine (fig. 13, map no. 48) and Hattie prospect (fig. 13, map no. 56) and are not completely clear.

A lineament occupied by a creek extends north-south across the Helen S Mine patented claims. Some parts of the lineament may be man-made as the result of excavation. The location of each working is described according to its position along this south-flowing creek, i.e., the distance from the mouth of the creek at the beach to each location.

The BLM's examination of the Helen S Mine was confined to exposures in trenches, pits, and the tops of caved or flooded shafts (fig. 15). The examinations revealed mill ruins 150 feet from the beach and two shafts located 400 feet (the southern shaft) and 640 feet (the northern shaft) up the creek. There are tailings in the intertidal zone, and a 120- by 150-foot dump is located north of the mill. The southern shaft is caved approximately 10 feet below the collar and does not expose bedrock. The northern shaft is flooded, with the water level approximately 10 feet below the collar. Pits and trenches are located at distances of 150, 470, 750, and 1,100 feet up the creek and 450 feet to the east of the mill ruins.

BLM personnel collected 33 samples from the Helen S Mine. Thirty of these contained below 152 ppb gold. Three contained from 4,248 ppb to 0.328 oz/t (11,246 ppb) gold (map nos. 44.1, 44.10, 44.11, samples 30, 36, 213). The lowest grade of the three, which contained 4,248 ppb gold, was a grab sample of slightly iron-stained, silicified schist collected from the trench located 1,100 feet up the creek (map. no. 44.1, sample 36). Another sample from the same location contained only 11 ppb gold (map. no. 44.1, sample 381). At the shaft 640 feet up the creek, a 1.5-foot-thick quartz vein contained 0.328 oz/t gold (map no. 44.11, sample 30). The 1.5-foot vein is exposed in the east and west walls of the shaft, but is covered along strike. A grab sample of quartz from the shaft's dump assayed 4,536 ppb gold (map no. 44.1, sample 213). Additional elements found in the three highest-grade gold samples include silver up to 22.7 ppm, copper up to 570 ppm, lead up to 795 ppm, zinc up to 1,042 ppm, and arsenic up to 1,471 ppm. Mill tailings samples contained up to 771 ppb gold, 16.5 ppm silver, 1,888 ppm lead, 1.4 percent zinc, and 371 ppm arsenic (map nos. 44.21, 44.22, samples 40, 41).

A sample collected from a 0.1-foot-thick quartz vein, located approximately 1,000 feet south of the Helen S Mine, contained 3,878 ppb gold and 3,494 ppm arsenic (map no. 44.25, sample 281). This vein is located on the beach and can only be traced for a few feet.

The highest silver, lead, and zinc values were found in the pit located 470 feet up the creek and in a trench and adjacent cut located 750 feet up the creek. The lower pit exposes a massive sulfide lens hosted in greenstone/greenstone schist in its south wall. The lens, or zone, strikes approximately 340° and dips 30° to the southeast. It is exposed for 10 feet and grades from massive sulfides to silicified schist with approximately 10 percent sulfides. The sulfides consist of pyrite, galena, and sphalerite. A 1.6-foot sample across the massive sulfide zone contained 65 ppm silver, 9,560 ppm lead, and 2,540 ppm zinc (map no. 44.13, sample 382). A sample across a 0.7-foot-thick part of the lens contained 3,078 ppm lead and 3.0 percent zinc (map no. 44.13, sample 383). Select samples from the pit dump and of flyrock in the vicinity contained from 38.9 to 113.5 ppm silver, from 7,539 ppm to 2.5 percent lead, and from 4.0 to 5.3 percent zinc (map nos. 44.12, 44.15 samples 32, 215, 9642).

The trench and cut located 750 feet up the creek exposes silicified zones containing pyrite, galena, and sphalerite hosted in brecciated schist and slate. The silicified zones trend 004°, 64° east to 015°, 54° east. A sample 0.9 feet long taken across one zone contained 1.78 oz/t silver, 1.09 percent lead, and 12.8 percent zinc (map no. 44.6, sample 9565). Samples of nearby dump and rubblecrop contained up to 2.13 oz/t silver, 1.74 percent lead, and 8.5 percent zinc (map nos. 44.3, 44.5, 44.8, 44.9, samples 38, 39, 2359, 9700).

The BLM's sampling indicates that gold is not associated with the base metal massive sulfide zones exposed at the Helen S Mine. Gold is confined to narrow quartz veins. Arsenic is more directly associated with the gold-bearing veins than the base metal sulfide zones.

Conclusions

Surface sampling is insufficient to adequately evaluate reports of gold and base metal mineralized rock at the Helen S Mine. Early reports were apparently based on owner reports and underground exposure of the mineralized rock. The BLM's surface examination failed to identify the 40-foot-wide by 1,000-foot-long zone of base metal or gold mineralization referred to by Berg and Cobb (1967). While there is insufficient data to verify early reports, BLM sampling indicated sufficient values in base metals to warrant more detailed examination.

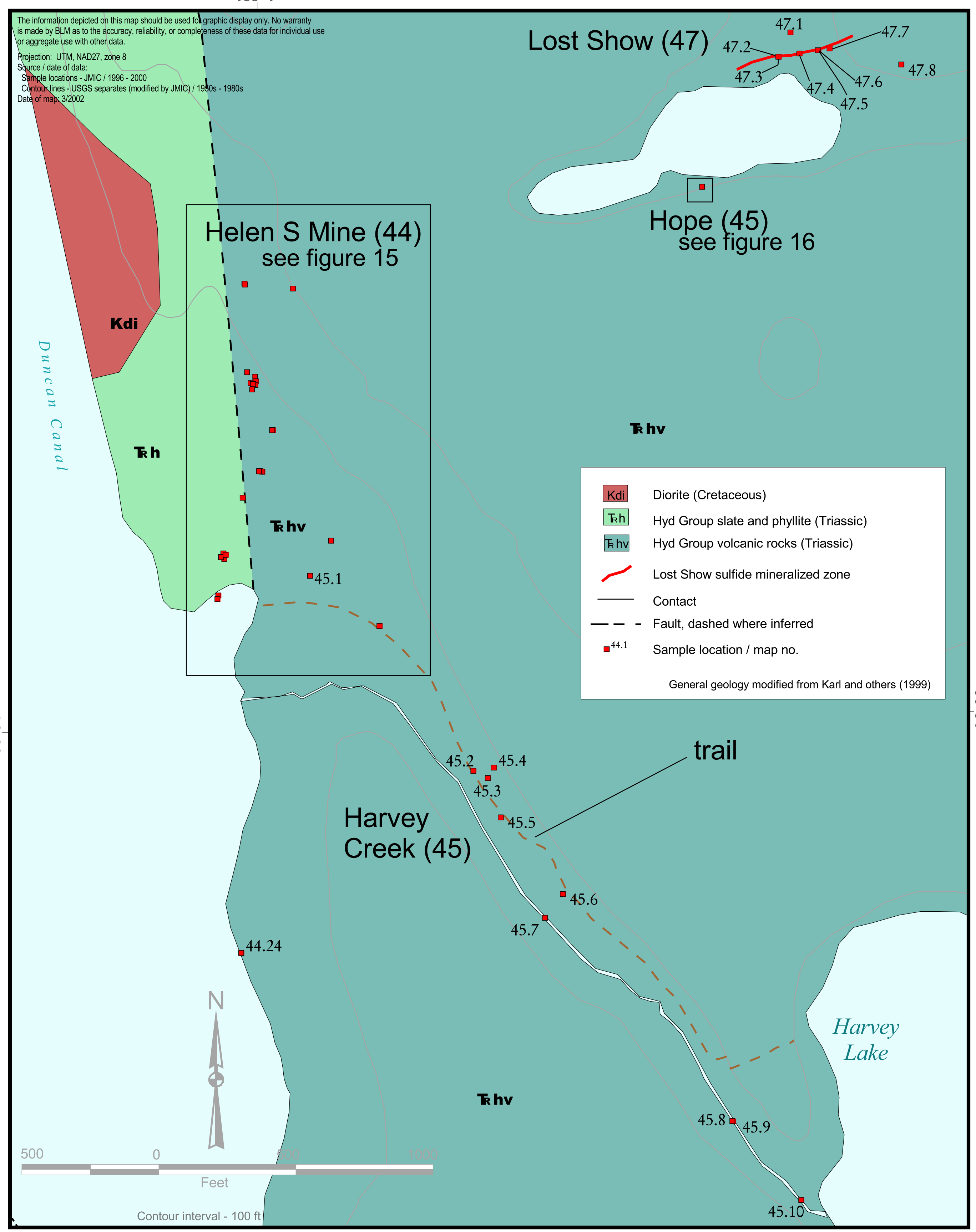


Figure 14. Map of Northwest Woewodski Island showing the Lost Show, Hope, and Harvey Creek prospects and the Helen S Mine.

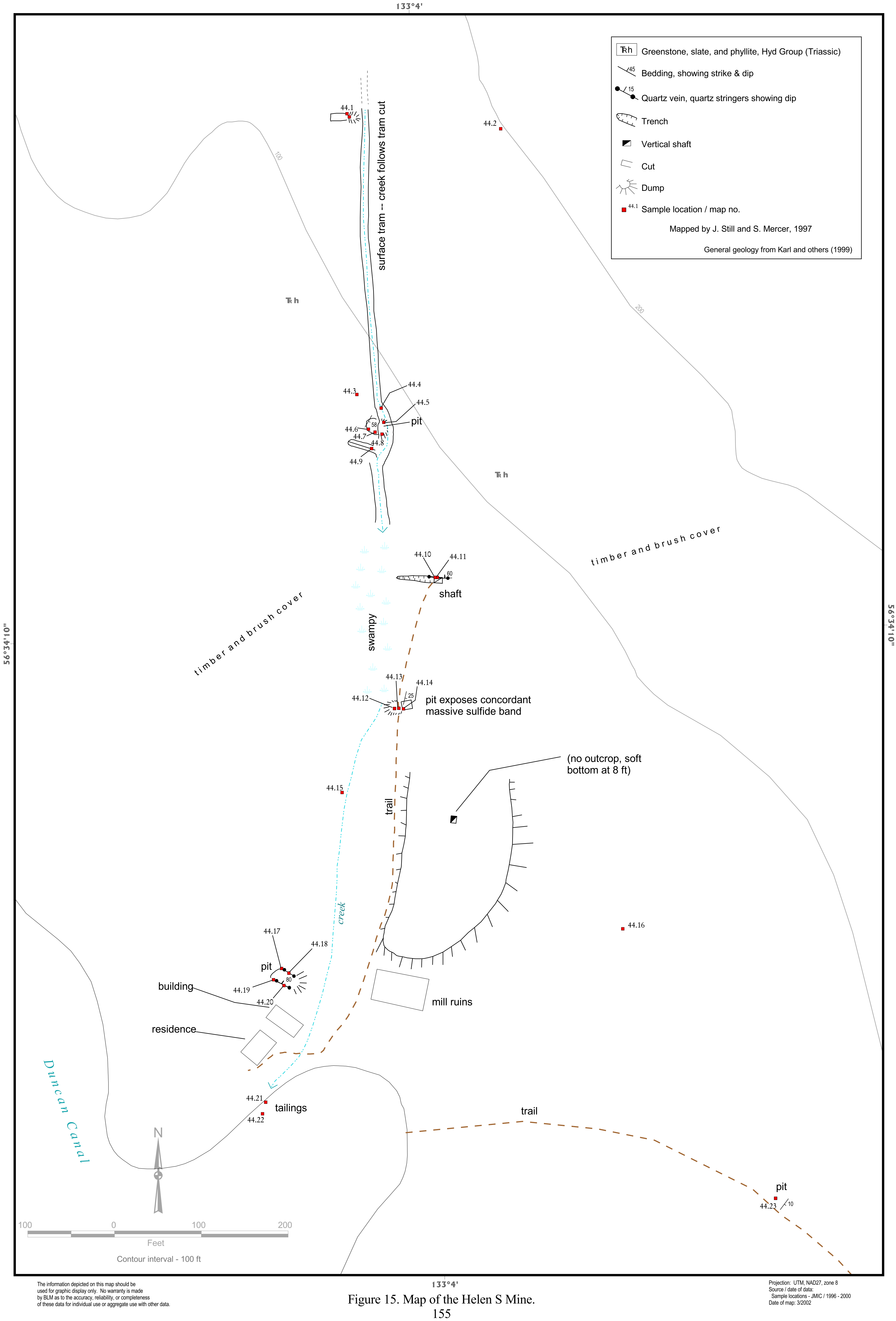


Figure 15. Map of the Helen S Mine.

HARVEY CREEK

(Figure 14, Map no. 45)

MAS no.:	0021170179	*Quadrangle:*	Petersburg, C4
Deposit Type:	Vein: Au	*Latitude:*	56.5327
Land Status:	Open Federal	*Longitude:*	-133.0478
Development:	Adit, cuts, 2 DDH	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location/Access

The Harvey Creek prospect is on the northwest side of Woewodski Island, 18 miles south-southwest of Petersburg. It is situated along the 0.5-mile-long creek that drains Harvey Lake to the west. Although the banks of the creek are steep in places, the area topography is gently sloping, with thick brush and timber cover. A Forest Service trail crosses the Harvey Creek prospect. The trail leads from Duncan Canal along the north bank of the creek to a Forest Service cabin on the west side of Harvey Lake. Access to the creek trail is via float plane or boat.

History

An old, hand-drafted map, from the files of a Petersburg resident, depicts the northwest end of Woewodski Island. The map, compiled from old records and maps, is dated August 1933. It shows two claims located along the stream that drains west from Harvey Lake into Duncan Canal (Northwest Woewodski, 1933). Just below the Forest Service trail, 2,000 feet from Duncan Canal, the portal of a caved adit and the remains of an impact mill are located on the north side of the creek.

During 1997 P. Beardslee, of Petersburg, drilled two core holes to evaluate the mineralized rock at the prospect. Active claims covering the Harvey Creek prospect are held by the Petersburg resident who accomplished the core drilling.

Mineral Assessment

Rocks at the Harvey Creek prospect are mapped as Upper Triassic (Karl and others, 1999) felsic and intermediate volcanics of the Hyd Group (Brew, 1997j). Outcrops along the creek include phyllite that is locally silicified and pyritized. The phyllite strikes 315° to 010° with a shallow dip.

The 1933 map shows a high-grade stringer and cuts located at various points up the creek: the first at 1,200 feet, the second at 1,500, and a third at 2,000 feet. Seven sample results are listed on the map. Two samples, each 1.0 foot long, collected at the high-grade stringer assayed 1.26 and 1.89 oz/t gold. Three samples ranging in length from 2.0 to 2.75 feet were collected from the second cut, at 1,500 feet up the creek These assayed from 0.02 to 0.10 oz/t gold. Two samples ranging in length from 2.0 to 7.5 feet collected from the third cut (at 2,000 feet up the creek) assayed from 0.02 to 0.06 oz/t gold (Northwest Woewodski, 1933).

BLM personnel found the remains of a pelton wheel, an impact mill, and quartz dumps in the vicinity of the third cut and a caved adit 2,150 feet up the creek. One diamond drill hole, east of the caved adit at an elevation of 140 feet, is 189 feet deep. The other, on a bank overlooking the creek west of the adit at an elevation of 60 feet, is 94 feet deep. Both holes were drilled vertically (P. Beardslee, oral commun., 1997). Both cores contained gray phyllite and greenschist with up to 5 percent pyrite. No base metal sulfides nor significant quartz were observed in the core of either hole.

BLM samples from quartz dumps at the mill assayed from 5,482 to 7,944 ppb gold (map no. 45.3, samples 572, 2874). These dumps probably represent mill feed. Samples of quartz below the adit and of silicified, iron-stained phyllite from along and to the north of the creek, contained up to 36 ppb gold, 340 ppm copper, and 365 ppm zinc (map nos. 45.2, 45.6, 45.7, samples 276, 9591, 9643). A soil sample from the western end of the Harvey Lake trail contained 1,208 ppb gold (map no. 45.1, sample 9569).

An attempt was made to trace the high-grade stringer as it is represented in the vicinity of the mill on the 1933 map (Northwest Woewodski, 1933). The area to the north of the mill is swampy and under cover. A shallow cut and quartz dump are located 50 feet northeast of the mill in the vicinity of the projection of the high-grade stringer. Two samples from the dump contained 341 and 6,811 ppb gold (map no. 45.4, samples 573, 574). BLM personnel did not locate the high-grade stringer north of the cut.

Conclusions

The high-grade stringer shown on the 1933 map and sampled by the BLM at map no. 45.4 may have been mined near the surface to feed the mill. BLM sampling indicates small amounts of gold in the mill feed. However, shallow drilling in 1997 failed to reveal significant mineralized rock. The Harvey Creek prospect is not sufficiently mineralized to attract exploration interest.

HOPE

(Figures 14,16, Map no. 46)

MAS no.:	0021170180	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au	*Latitude:*	56.4834
Land Status:	Open Federal	*Longitude:*	-131.9956
Development:	Trenches	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location Access

The Hope prospect is on the northwest side of Woewodski Island, 16 miles south-southwest of Petersburg. The topography is gently sloping, with brush, timber, and muskeg covering the area. Access to the property can be gained by float plane or boat to the Helen S Mine (map no. 43), and from there, a trail leads across private property to the south side of Lost Lake. A trench and vein are located between the south side of Lost Lake and the trail. Alternate access is by helicopter.

History

An old hand-drafted map, from the files of a Petersburg resident, depicts the northwest end of Woewodski Island and shows four claims, called the Hope, along the south side of Grass Lake (now called Lost Lake). This map was compiled from old records and maps and is dated August 1933 (Northwest Woewodski, 1933).

The Hope prospect is 750 feet southwest of the massive sulfide lead-zinc mineralization exposed on the Lost Show prospect (map no. 47). Diamond drill holes that intercept the Lost Show mineralization are near the trail south of the Hope trench. The more recent history of the Hope prospect is the same as that of the Lost Show. The Lost Show claims that include the Hope prospect were active as of 1999, but are currently idle.

Mineral Assessment

The Hope prospect is in the Upper Triassic Hyd Group (Karl and others, 1999) and consists of felsic and intermediate volcanic flows and breccias, limestone, and argillite. To the west of the property, hornblende diorite intrudes the volcanic flows (Brew, 1997j).

The old map shows a 200-foot-long zone trending east-west and cut by two trenches. The easternmost trench is noted as caved. Three samples ranging in length from 3.0 to 7.0 feet are shown at the western trench. They assayed from 0.02 to 0.1 oz/t gold (Northwest Woewodski, 1933).

BLM personnel located, mapped, and sampled the western trench (fig. 16). It is approximately 5 feet wide by 45 feet long and 3 feet deep. It exposes 12 feet of quartz rubble, 19 feet of quartz vein, and 17 feet of greenstone schist. Based on poor contact exposures in the trench it is estimated that a quartz vein at least 19 feet wide trends 330° and dips 45° southwest. A chip sample, 8.7 feet long, collected from the middle of the vein averaged 4,440 ppb gold (map. nos 46.2, 46.3, samples 686, 687). Samples collected of quartz vein on either side of these samples and from the contact did not contain significant gold.

Conclusions

BLM samples and previous samples taken from the Hope vein indicate sufficient grade and width to warrant soil sampling in order to determine the extent of the gold mineralization.

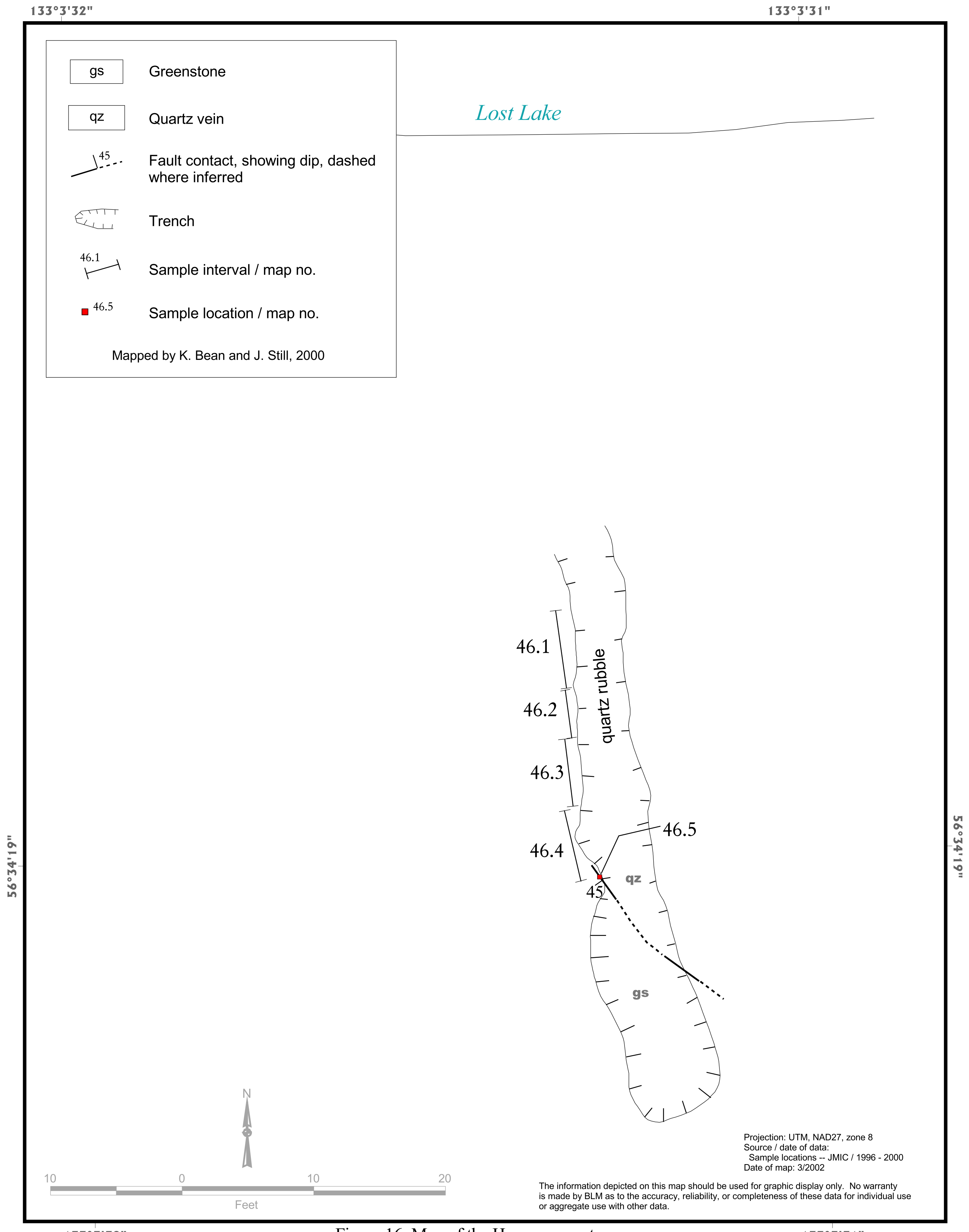


Figure 16. Map of the Hope prospect.

LOST SHOW

(Figure 14, Map no. 47)

MAS no.:	0021170182	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Zn, Pb, Ag	*Latitude:*	56.3818
Land Status:	Open Federal	*Longitude:*	-132.8984
Development:	16 DDH, trenches	*MDP:*	Medium
BLM work:	Mapped, sampled	*MEP:*	High

Location Access

The Lost Show prospect is on the northwest side of Woewodski Island, 16 miles south-southwest of Petersburg. The topography is gently sloping, with brush, timber, and muskeg covering the area. Access to the property can be gained by float plane or boat to the Helen S Mine (map no. 38), and from there, a trail leads across private property to the northeast side of Lost Lake and the Lost Show prospect. Alternate access is by helicopter.

History

Most of the northwestern part of Woewodski Island was staked during the late 1970's and early 1980's. Cominco, Colony Pacific, Amselco, Kennecott, and Westmin Resources were all active in the area sometime between 1978 and 1998. A number of area prospects were examined through soil sampling, geophysical surveying, and diamond drilling (J. McLaughlin, oral commun., 1998).

The Lost Show prospect was discovered by Cominco geologists in 1985. Between 1986 and 1988, Amselco, in partnership with Cominco, drilled 16 shallow holes there. In 1993 Westmin entered into a partnership with Amselco and in 1996 carried out a program of mapping, soil sampling, induced potential geophysical surveying, and prospecting of both the Lost Show site and the area between it and the Scott prospect (map no. 50). The induced potential survey failed to detect the Lost Show mineralization. In 1998 Westmin announced a "geological reserve" for the Lost Show prospect (Terry, 1998). Boliden, Ltd. acquired the property in its take-over of Westmin, and in 1999 held the claims at the site. As of 2002, the claims were inactive.

Mineral Assessment

The Lost Show prospect is located in the Upper Triassic Hyd Group (Karl and others, 1999) that consists of felsic and intermediate volcanic flows and breccia, limestone, and argillite (Brew, 1997j). Rocks exposed at the prospect consist of tan schists that have been identified by Westmin geologists as meta-andesite (Terry, 1998). Studies and analysis by Newberry and Brew (1997) indicate that the "andesite" is actually an altered, more mafic rock, likely a metabasalt.

Based on 16 shallow drill holes and surface outcrops, Westmin published a "geological reserve" (resource) for the Lost Show prospect of 500,000 tons grading 8.1 percent zinc, 0.6 percent lead, and 2.5 oz/t silver (Terry, 1998). Information on the drilling was not made available for this study.

The BLM's investigation of the prospect revealed three mineralized outcrops or cuts, roughly aligned along a strike of 072°. The mineralized rock is approximately conformable to the grain of the host metabasalt and dips steeply. The first (No. 1) outcrop/cut is located at the edge of Lost Lake (photo 13), the second (No. 2) is located 90 feet (at 072°) from the first, and the third (No. 3) is located 200 feet (at 072°) from the first. The area surrounding the outcrops/cuts is covered with muskeg, brush, and timber.

The No. 1 outcrop or cut exposes a 5-foot-thick, steeply dipping, massive sulfide band hosted in tan-weathering schist. The sulfides are pyrite, sphalerite, and galena. A 4.4-foot chip sample across part of the zone contained 153.8 ppm silver, 5,519 ppm lead, and 11.5 percent zinc (map no. 47.2, sample 198). A 0.6-foot sample across the remainder of the zone gave similar results (map no. 47.2, sample 197). At outcrop No. 2, two narrow sulfide bands dip 64° to the south and contain pyrite, sphalerite, and galena (photo 13). They are hosted in the same tan-weathering schist as outcrop No. 1. A 7.5-foot sample across this outcrop assayed 83.9 ppm silver, 5,180 ppm lead, and 4.5 percent zinc (map no. 47.4, sample 9639). The No. 3 outcrop or cut exposes brown-weathering schist that hosts a steeply dipping, 1.1-foot-thick band of sulfides. This band assayed 282 ppm silver, 2.79 percent lead, and 24.15 percent zinc (map no. 47.5, sample 9697). These sample results correlate well with Westmin's resource grades of 2.5 oz/t silver, 0.6 percent lead, and 8.1 percent zinc (Terry, 1998).

Photo 13. A cut exposes several feet of sphalerite at the Lost Show prospect. Don Grybeck, USGS, inspects the rock. Photo by J. Still.

Conclusions

The Lost Show has sufficient indications of grade and extent to be a prospective target for exploration, both down dip and along strike. The general vicinity, particularly the area between the Lost Show and the Scott (map no. 51), is also a prospective exploration area.

MAID OF MEXICO MINE

(Figure 17, Map no. 48)

MAS no.:	0021170015	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au	*Latitude:*	56.5651
Land Status:	Open Federal	*Longitude:*	-133.0291
Development:	3 adits, stopes, cuts, mill	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location Access

The Maid of Mexico Mine is on north-central Woewodski Island, 17 miles south of Petersburg, on the northeast side of Harvey Lake, at an elevation of 340 feet. The area topography is gently sloping to moderately steep, with brush and timber covering the property. Access to the mine can be gained by float plane to Harvey Lake and then by a short trail from the northeast side of the lake. Alternatively, a trail leads to the mine from tide water on the Helen S property (map no. 43) located 1½ miles to the west.

History

The Maid of Mexico Mine was first staked in 1906 on a gold-bearing quartz vein (Nelson, 1931). By 1908 a 40-foot adit had been driven (Wright, 1909). By 1916 workings consisted of a 130-foot crosscut, 170 feet of drift, a short adit, and pits and trenches. A test shipment was made by 1916 (Chapin, 1918). Buddington (1923) reports that the vein averaged 4½ feet thick at $20 per ton (1 oz/t) and had been traced for 2,000 feet.

A report by Nelson (1931) indicates that the Maid of Mexico vein could be traced for 750 feet on the surface. He reported that a small stope had been started on the vein and a 10-stamp Straube mill was being installed. A partly legible assay plan is attached to the Nelson report. Seven samples, with vein widths varying from 6 to 15 inches, were collected from the drift and raise and range in value from $2.64/ton to $98.81/ton and average $40.62/ton (gold at $20.67/oz). Eight samples, with widths ranging from 6 to 20 inches, were collected down the shaft. Although values are not all readable on the Nelson map, six are below $1.00/ton and two are above, at $9.30 and $23.98/ton (Nelson, 1931). By 1939 over 1,000 feet of underground workings were reported (Smith, 1941).

Bureau of Mines production records indicate that the Maid of Mexico Mine produced gold in 1915, 1930, 1931, 1933, and 1936. There is some confusion as to the units, i.e., dollars or ounces, used in the records, but it appears that 158 ounces of free-milling gold and 1,038 ounces of gold from concentrate were produced (U.S. Bureau of Mines, Mine Production records).

In 1945 J.C. Roehm examined the property for the Alaska Territorial Department of Mines (Roehm, 1945). He reported three tons of concentrates at the mill, the No. 1 adit portal, and three opencuts northeast of the raise to the surface (fig. 17, map nos. 48.11, 48.10, 48.1, 48.2, and 48.5 respectively). A sample from the concentrates assayed 1.62 oz/t gold (fig. 17, map no.

48.11). Samples from the cuts northeast of the shaft contained: 5 feet at 0.63 oz/t gold (fig. 17, map no. 48.1), 0.4 feet at 0.98 oz/t gold (fig. 17, map no. 48.2), and gold not detected (fig. 17, map no. 48.5).

In 1953 Alaska Territorial Department of Mines mining engineer James A. Williams examined the underground workings at the property (Williams, 1954), which Roehm had earlier reported as caved (Roehm, 1945). Williams reported a 130-foot crosscut and 260 feet of drift along the vein, with a flooded winze and a raise to the surface. He collected eight samples in the drift at five locations along the vein. Williams' sample results are markedly lower than those reported by Nelson in 1931. Adjacent to a sample reported by Nelson to assay $98/ton (4.7 oz/t at $20.67/oz gold), Williams obtained 0.06 oz/t. At another location, Williams' samples across the vein averaged less than 0.02 oz/t across 44.5 inches. Samples across stringers from 2 to 3 inches thick contained from 0.47 to 0.64 oz/t gold. Williams attributes the disparity in sample values to spotty gold occurrence in the vein (Williams, 1954).

An old hand-drawn, uncredited, undated, poorly copied, and incomplete map, taped together from numerous copies was given to the BLM by E. Magill, who is one of the owners of claims that cover the Maid of Mexico Mine. It shows three adits, a winze, three raises or stopes, and two cuts, and gives the location and results of 110 samples collected from these workings. A few of the sample results are unreadable, a few are located off the edge of the copies supplied, some do not have reported widths, and a few of the highest grades have question marks beside them (Magill, undated). The scale had to be estimated. It was likely drawn by W.M. Jasper who is reported to have consulted for a Canadian concern during the 1930's (Williams, 1954).

No activity was reported on the property from 1953 to 1998. The Maid of Mexico Mine claims are currently held by a Petersburg resident.

Mineral Assessment

The Maid of Mexico Mine is hosted in units mapped as Mesozoic semischist and phyllite, Mesozoic phyllite and slate, and Triassic felsic and intermediate volcanics (Brew, 1997j). Karl classifies these rocks as Triassic Hyd Group (Karl and others, 1999). At the mine scale, the vein is near the contact between slate and siliceous dolomite (Berg and Cobb, 1967), with slate in the hanging wall and dolomite in the footwall (Nelson, 1931). A map of the underground workings shows the vein striking east to northeast and dipping 65° to the south (Williams, 1954). Williams (1954) reports that the 2- to 7-foot-thick quartz vein contains small amounts of pyrite, galena, sphalerite, and free gold.

The BLM's investigation revealed the remains of a sheet metal and wood cabin, a wood cabin with a tarp top, and the remains of a Straube mill (photo 14). Investigators located and examined three adits: the No.1, or main adit, is caved at the portal (elevation 340 feet), the No. 2 is 30 feet long (elevation 385 feet), and the No. 3 is 45 feet long (elevation 404 feet). A shaft (elevation 453 feet) that connects to the No. 1 adit is caved near its collar. Several trenches or cuts expose the vein on the surface above the adits (fig. 17).

The three adits are collared in slate near a northeast-trending contact between dolomite and slate. The Nos. 2 and 3 adits expose slate, dolomite, and narrow, discontinuous quartz stringer zones. Samples collected from the Nos. 2 and 3 adits contained from 11 to 1,462 ppb gold (map nos. 48.3, 48.7, samples 2381-2385). Quartz samples from the Nos. 2 and 3 adit dumps contained from 13 to 540 ppb gold (map nos. 48.4, 48.8, samples 504, 505, 2620). A quartz dump sample from the No. 1 adit contained 8,289 ppb gold (map no. 48.10, sample 506).

Surface cuts and trenches expose a quartz vein up to 1.8 feet thick above the Nos. 2 and 3 adits for a distance of 160 feet. This vein strikes east to northeast and dips 73° to 80° to the south. BLM personnel collected five samples from the vein and a one from quartz rubble. The samples contained from less than 5 ppb to 1,351 ppb gold (map nos. 48.1, 48.2, 48.5, 48.6, samples 502, 503, 724, 2386, 2387, 9575).

The old Straube mill, located below the No. 1 adit, contained remnant mill feed and concentrate. Samples of the feed contained up to 6,584 ppb gold, 1,567 ppm lead, 1138 ppm zinc, and 426 ppm arsenic (map nos. 48.11, 48.12, samples 507, 2388). Samples of the sulfide-rich concentrate contained up to 1.385 oz/t gold, 3.17 oz/t silver, 1,224 ppm copper, 2.05 percent lead, 746 ppm zinc, and 4,297 ppm arsenic (map nos. 48.11, 48.12, samples 508, 2389-90).

The Magill map is sufficiently complete to estimate some grades. The No. 1, or main adit, consists of a 130-foot crosscut, a 250-foot drift, three raises or stopes, and a winze with a sublevel. Based on 69 samples, the 250-foot drift averages 0.2 oz/t gold at a width of 1 to 4 feet. Based on 17 samples, two of the raises average 0.3 oz/t gold at a width of 1 to 4 feet. A third raise, 80 feet long, reaches the surface and, based on three samples, averages 0.16 oz/t gold. A fourth sample from this raise assayed 2.80 oz/t gold. Widths range from 3 to 4.5 feet. Eleven samples from a sublevel near the bottom of the winze contained from a trace to 0.05 oz/t gold (Magill, undated).

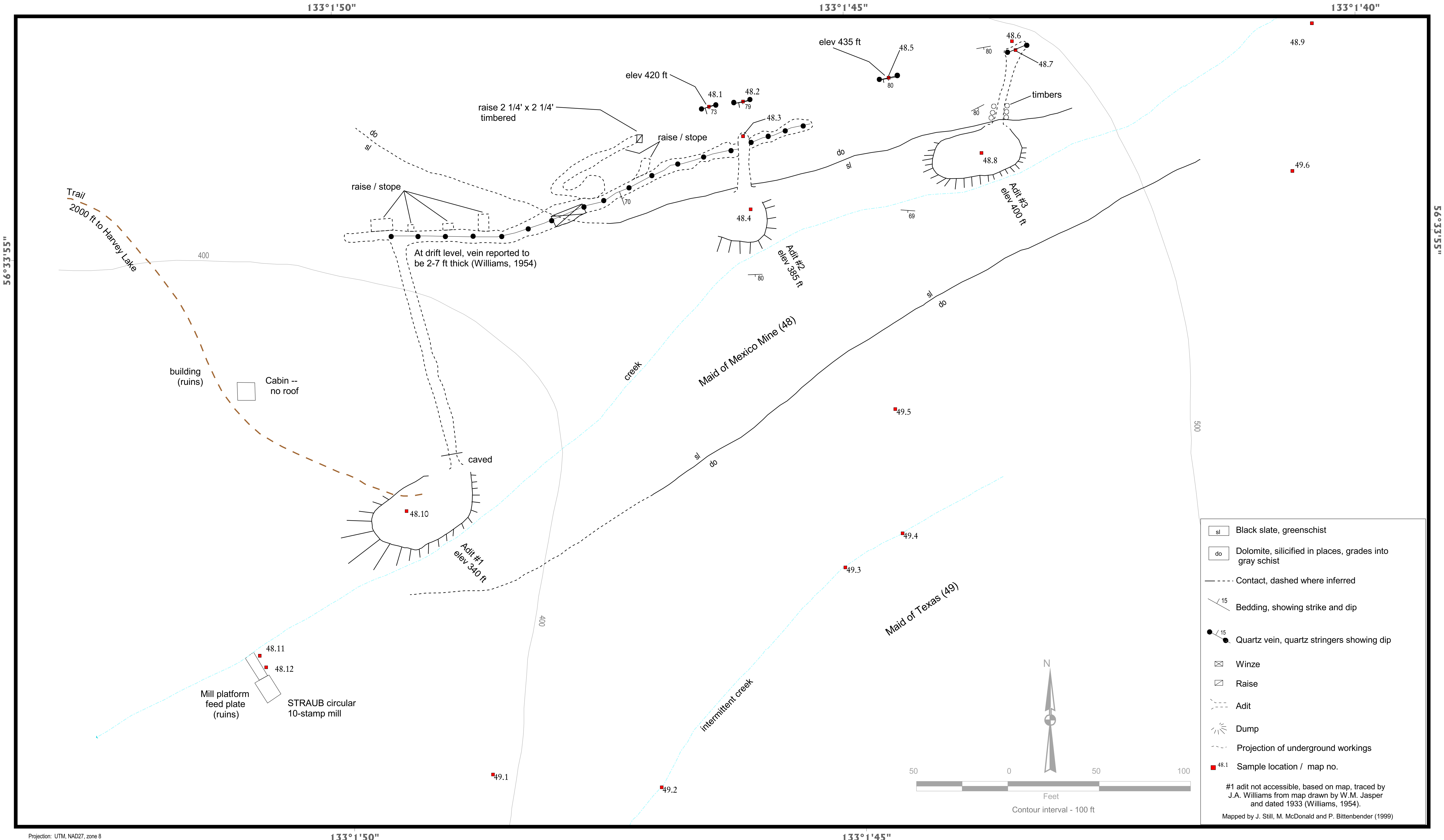
The Magill map shows two surface cuts. Two samples collected from the westernmost surface cut contained 0.09 and 1.60 oz/t gold at widths of 0.5 and 0.9 feet respectively. A third sample contained 8.00 oz/t gold (This number is portrayed with question marks on the map). Four samples from the easternmost surface cut contained from a trace to 0.08 oz/t at widths of 1.9 to 3.0 feet (Magill, undated).

Conclusions

The gold values in samples collected by the BLM and by mining engineer James A. Williams (1954) are markedly lower than those reported on the assay map attached to a report by Nelson (1931), the Magill map (undated), or the average mined grade of 1 oz/t reported by Buddington (1923). This disparity in values could be the result of higher-grade ore having been mined out prior to sampling, the spotty occurrence of gold in the vein, or selective sampling and reporting. Both Nelson (1931) and the Magill map (undated) indicate significantly lower values in the

winze and sublevel than in the raises. Even the best gold value reported by Nelson, $98 per ton across 15 inches, is only 1.2 oz/t across a 5-foot mining width (gold at $20.67/oz).
The narrow veins of the Maid of Mexico Mine contain sufficient values to attract some exploration interest.

Photo 14. Ruins of a ten-stamp Straub mill that was installed at the Maid of Mexico Mine during the 1920's. Inset shows the manufacturer’s plate. Photo by J. Still.



Projection: UTM, NAD27, zone 8
Source / date of data:
Sample locations - JMIC / 1996 - 2000
Date of map: 3/2002

Figure 17. Map of the Maid of Mexico Mine and the Maid of Texas prospect.

The information depicted on this map should be used for graphic display only. No warranty is made by BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

MAID OF TEXAS

(Figure 17, Map no. 49)

MAS no.:	0021170184	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au	*Latitude:*	56.6671
Land Status:	Open Federal	*Longitude:*	-132.2380
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location Access

The Maid of Texas prospect is on north-central Woewodski Island, 17 miles south of Petersburg, on the northeast side of Harvey Lake, at an elevation of 340 feet. The area topography is gently sloping to moderately steep, with brush and timber covering the property. Access to the mine can be gained by float plane to Harvey Lake and then by a short trail from the northeast side of the lake. Alternatively, a trail leads to the mine from tide water on the Helen S property (map no. 43) located 1½ miles to the west.

History

An old, hand-drafted map from the files of a Petersburg resident depicts the northwest end of Woewodski Island and shows the two Maid of Texas claims located south of and adjacent to the Maid of Mexico claims. This map, dated August 1933, was compiled from old records and maps (Northwest Woewodski, 1933).

Mineral Assessment

The Maid of Texas prospect is near the contact between units mapped as Mesozoic semischist and phyllite, Mesozoic phyllite and slate, and Triassic felsic and intermediate volcanics (Brew, 1997j). Karl classifies these as Triassic Hyd Group rocks (Karl and others, 1999).

The 1933 map shows the Maid of Texas claims located along a creek oriented northeast approximately parallel to the Maid of Texas vein. This map shows a cut located along the creek (Northwest Woewodski, 1933).

The BLM's investigation revealed a shallow gulch with intermittent water flow that contained scattered angular quartz rubble. Three samples collected from the quartz rubble contained up to 8 ppb gold and 419 ppm zinc (map nos. 49.2, 49.4, 49.5, samples 720, 721, 827). Two stream sediment samples collected from the gulch contained up to 23 ppb gold and 782 ppm zinc (map nos. 49.1, 49.4, samples 723, 826). Two samples collected from iron-stained, pyrite-rich schist located in the northeast area of the prospect contained 51 and 68 ppb gold (map no. 49.6, samples 509, 8747).

Conclusions

The Maid of Texas prospect is not sufficiently mineralized to attract exploration interest.

EAST OF HARVEY LAKE

(Figure 18, Map no. 50)

MAS no.:	0021170178	*Quadrangle:*	Petersburg C4
Deposit	VMS: Zn	*Latitude:*	56.4213
Land Status:	Open Federal	*Longitude:*	-132.5330
Development	9 DDH.	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location Access

The East of Harvey Lake prospect is on north-central Woewodski Island, 17 miles south of Petersburg. The topography is gently sloping, with brush, muskeg, and timber covering the area. Access to the prospect is gained by taking a helicopter to a nearby muskeg landing site and then bushwhacking to the sites.

History

The area surrounding Harvey Lake was staked during the late 1970's and early 1980's. Cominco, Colony Pacific, Amselco, Kennecott, and Westmin Resources were all active in the area sometime between 1978 and 1998. Diamond drilling, soil sampling, and geophysical surveying were carried out east of Harvey Lake (J. McLaughlin, oral commun., 1998). A "discovery diamond drill hole" containing significant zinc values is reported at the east end of Harvey Lake (P. Beardslee, oral commun., 1998). Neither the drill logs nor the exact location of the hole were available for this study. In 1999 P. Beardslee drilled 8 shallow holes in the area (fig. 18). These were collared in schist and phyllite and in some cases encountered small bands of massive pyrite (P. Beardslee, oral commun., 1999).

Mineral Assessment

The East of Harvey Lake prospect is located in Mesozoic semischist and phyllite (Brew 1997j). According to Karl and others (1999) these are Triassic Hyd Group rocks.

BLM investigators found a 5-foot-high by 17-foot-long outcrop in the western bank of a small stream in an area with extensive brush, timber, and muskeg cover. The outcrop consists of iron-stained, silicified schist with 10 percent pyrite that is disseminated and in conformable bands. The schist strikes 315° and dips 27° to 43° to the southwest. Four samples collected from the outcrop did not contain significant metal values (map nos. 50.3, 50.4, samples 384, 8650, 9571, 9699).

A sample was collected from a small landslide 400 feet west of the above location. It was cut across 0.4 feet of silicified massive pyrite and contained 1,023 ppm zinc (map no. 50.1, sample 538).

This area falls within the favorable RD 22 conductive zone (Pritchard, 1997). Anomalous Area 8 described by Bittenbender and others (2001) contains a discussion of soil and stream sediment samples collected in the area.

Conclusions

The BLMs' investigation of the East of Harvey Lake prospect failed to locate significant metal values, but it did locate narrow massive pyrite bands anomalous in zinc. The recent drilling by P. Beardslee also located narrow massive pyrite bands. This area also falls within the favorable RD 22 geophysical anomaly and Anomalous Area 8 discussed in Bittenbender and others (2001). The massive pyrite bands along with reports of a discovery hole containing significant zinc and the favorable geophysical and geochemical anomalies all indicate that the Triassic rocks in the general area are exploration targets of interest.

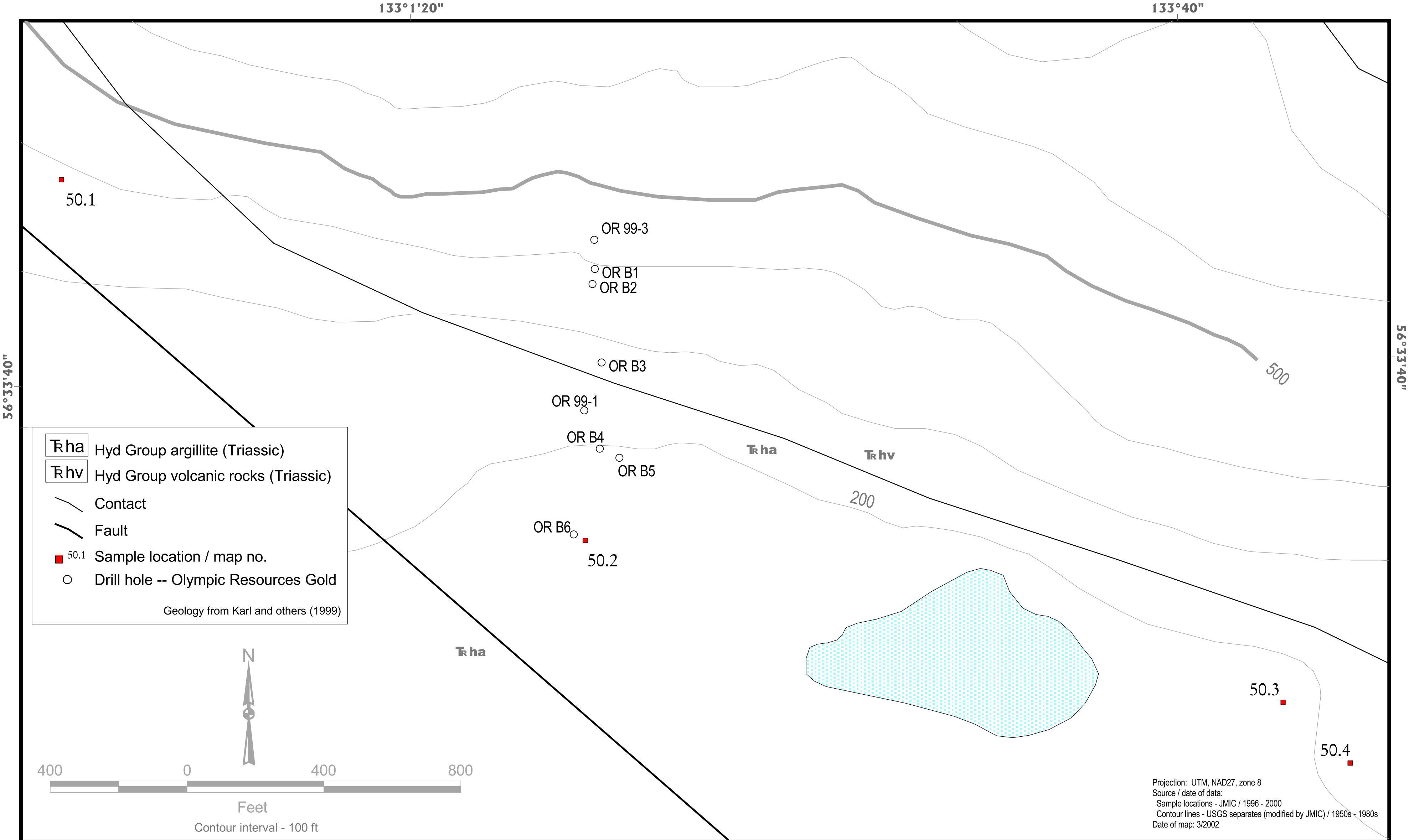


Figure 18. Map of the East of Harvey Lake prospect.

SCOTT

(Figures 19, 20, Map no. 51)

MAS no.:	0021170187	*Quadrangle:*	Petersburg C3
Deposit Type:	VMS: Zn, Pb	*Latitude:*	56.5733
Land Status:	Open Federal	*Longitude:*	-133.0054
Development:	3 DDH, cuts	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	High

Location/Access

The Scott prospect is at an elevation of 700 feet on north-central Woewodski Island. It is 16 miles south of Petersburg in an area of the island that is moderately steep, with brush and timber cover. The prospect is located in a steep gulch on the east side of the highest point on Woewodski Island and can be accessed by helicopter using a muskeg to the northwest as a landing site.

History

The Scott prospect was staked during the 1970's and early 1980's, as was most of the northern part of Woewodski Island. Cominco, Colony Pacific, Amselco, Kennecott, Houston International Minerals, and Westmin Resources were all active in the area sometime between 1978 and 1998. During the late 1980's and early 1990's, soil sampling and diamond drilling (about 3 holes) were used to evaluate the Scott prospect (J. McLaughlin and C. Rockingham, oral commun., 1998). The claims were active in 1999.

Mineral Assessment

The Scott prospect is in semischist and phyllite (Brew 1997j). According to Karl and others (1999), these are Triassic Hyd Group rocks (fig. 19). Maps by Houston International Minerals indicate that the area bedrock consists predominately of rhyodacite with some andesite and basalt (Houston International Minerals, 1980).

The BLM's investigation of the Scott prospect revealed a steep-walled gulch that contains massive bands/lenses and disseminations of sulfides (fig. 20). The gulch, formed by a shear zone that appears to conform to the grain of the country rock, trends 075°. The banding and schistosity trend in a similar direction and dip from 65° to 90° to the southeast. The BLM identified base metal sulfides and barite at scattered locations from elevations of 710 to 755 feet over a strike distance of 300 feet. Examination of the gulch to the east (down the gulch) failed to reveal additional mineralized rock. Muskeg, heavy brush, and timber cover the mineralized rock to the west and provide few outcrops.

The most significant mineralized rock is confined to massive barite, pyrite, galena, and sphalerite bands from 0.1 to 2.0 feet thick. These sulfide bands are found at scattered locations in lengths up to 30 feet. They occur in approximately 60 linear feet of the 300 feet mapped. Twenty-two samples were collected from these bands. They contained up to 1,122 ppb gold, 47.3 ppm silver, 2.63 percent lead, and 40.9 percent zinc (map nos. 51.7, 51.11, 51.26, samples 329, 336, 9679). Sphalerite is the predominate sulfide. The highest zinc value, 40.9 percent, was confined to a 0.3-foot width in the hanging wall of a 1.0-foot-thick lens (map no. 51.7, sample 329). A 0.7-foot-long sample at the same location contained only 14.2 percent zinc (map no. 51.7, sample 326). Samples from the bands/lenses also contained up to 56.35 percent barium (map no. 51.4, sample 331), greater than 2,000 ppm cadmium, and greater than 50 ppm mercury (map no. 51.7, sample 329). Samples of the schist hosting disseminated sulfides contained from 214 ppm to 1.5 percent zinc (map nos. 51.5, 51.8, 51.12, 51.15, 51.16, 51.18, 51.25, 51.28, samples 327, 333, 338, 339, 341, 343, 9672, 9680). A sample of quartz and greenstone float collected near the massive sulfide lens contained 8,157 ppb gold (map no. 51.2, sample 325).

Three diamond drill holes were located on the south side of the gulch. They were inclined to intercept the area of the highest zinc values (map no. 51.7, samples 326, 329; J. McLaughlin and C. Rockingham, oral commun., 1998). The results of the drilling were not made available for this report.

Conclusions

The apparent conformity of the bands and lenses of sulfides with the grain of the country rock is permissive of a volcanogenic origin for the Scott deposit. Later shearing resulted in the truncation of some mineralized bands. Although the bands are too scattered, narrow, and mostly low-grade to be considered for development, sufficient mineralized rock is exposed to warrant further exploration in the vicinity.

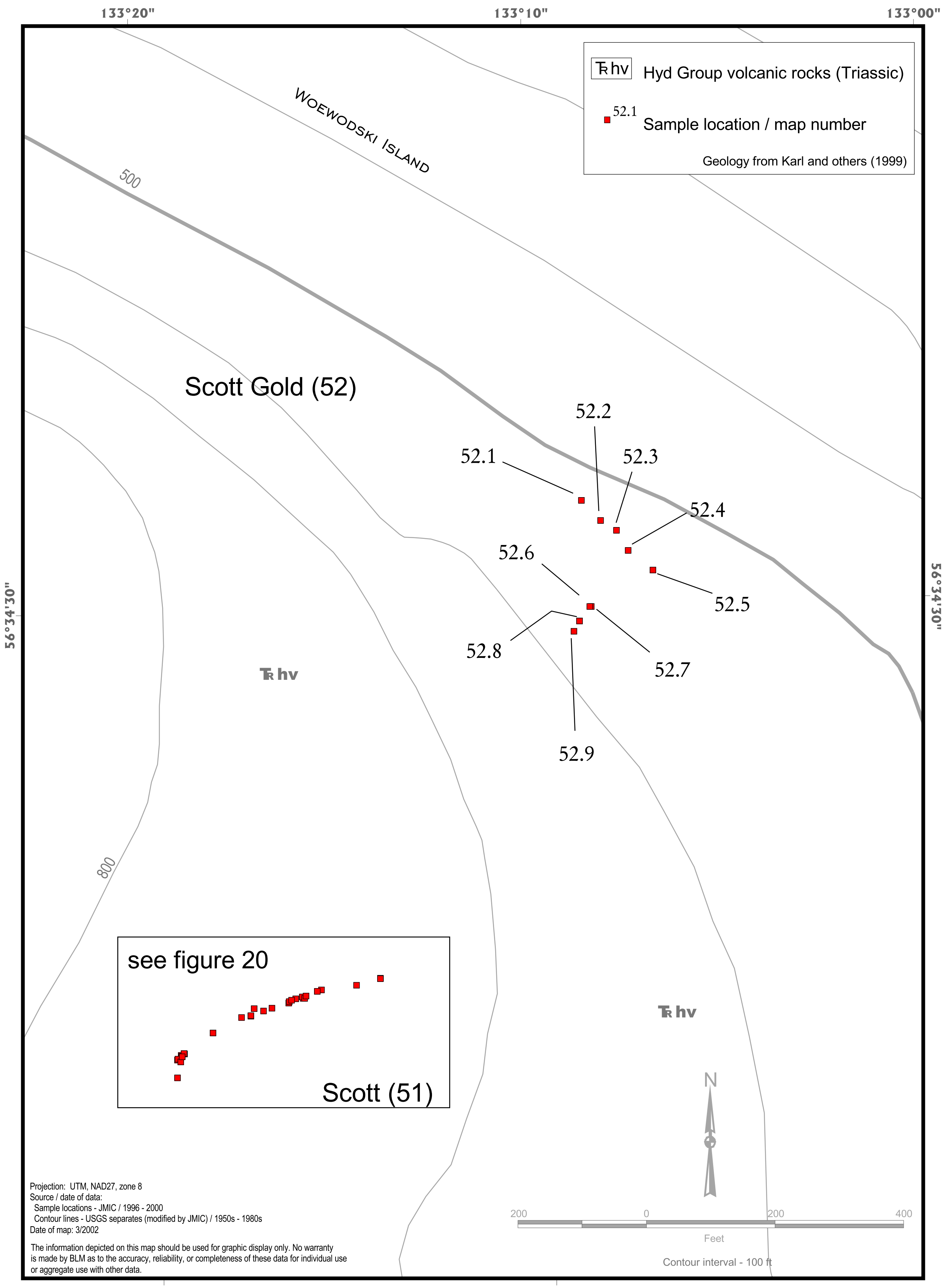


Figure 19. Map of the Scott Gold and Scott prospects.

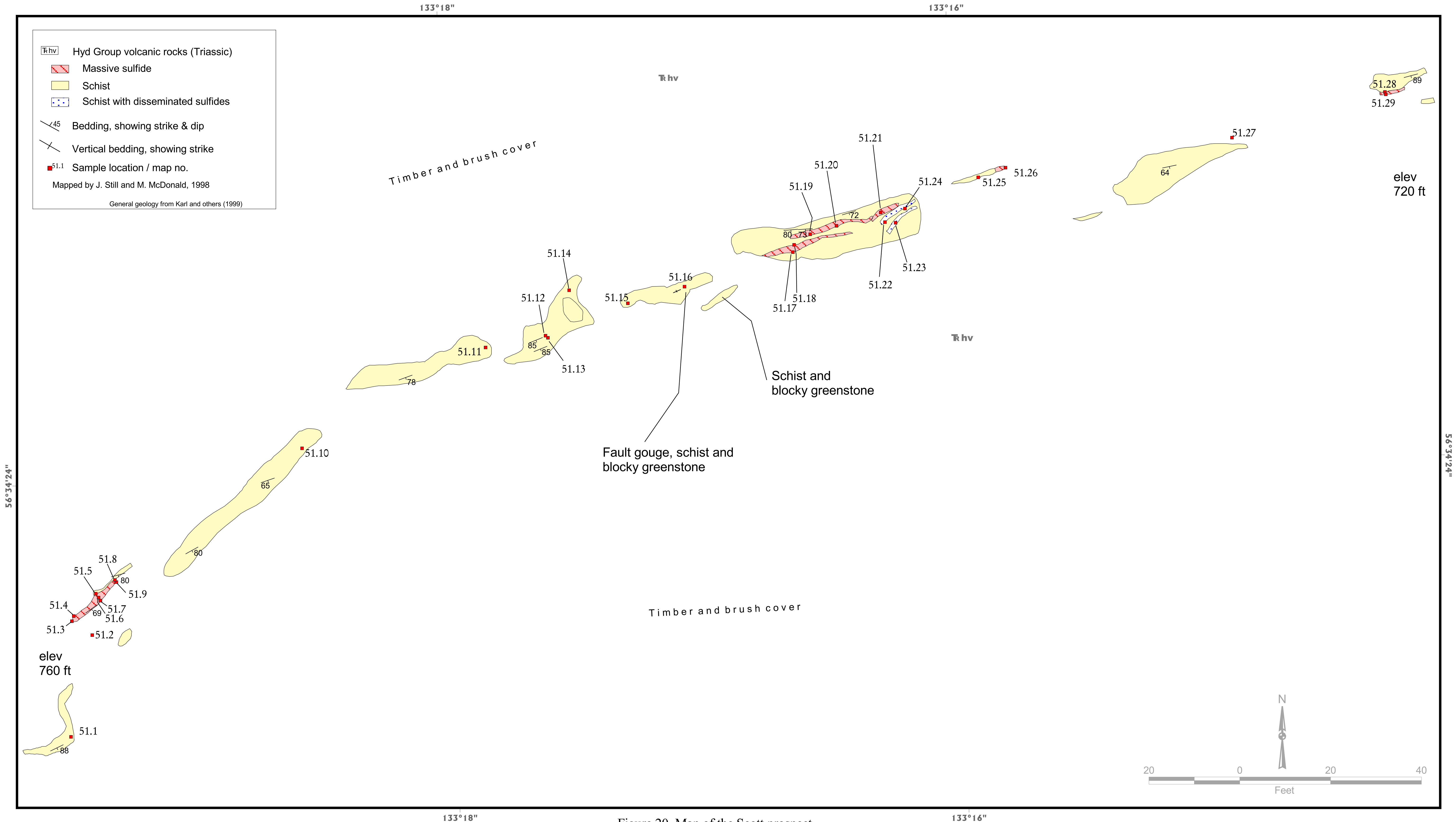


Figure 20. Map of the Scott prospect.

Projection: UTM, NAD27, zone 8
Source / date of data:
Sample locations - JMIC / 1996 - 2000
Date of map: 3/2002

The information depicted on this map should be used for graphic display only. No warranty is made by BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

SCOTT GOLD

(Figure 19, Map no. 52)

MAS no.:	0021170188	*Quadrangle:*	Petersburg C3
Deposit Type:	Vein: Au	*Latitude:*	56.5751
Land Status:	Open Federal	*Longitude:*	-133.0020
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location/Access

The Scott Gold prospect is at an elevation of 500 feet on north-central Woewodski Island. It is 16 miles south of Petersburg in an area of the island that is moderately steep, with brush and timber cover. The prospect is located in a shallow gulch approximately 1,000 feet northeast of the deep gulch that forms the Scott prospect (fig. 19). It can be accessed by helicopter using a muskeg to the northwest as a landing site.

History

The Scott Gold prospect history is the same as that of the Scott prospect. It was staked during the 1970's and early 1980's, as was most of the northern part of Woewodski Island. Cominco, Colony Pacific, Amselco, Kennecott, Houston International Minerals, and Westmin Resources were all active in the area sometime between 1978 and 1998. During the late 1980's and early 1990's, soil sampling was used to evaluate the Scott prospect (J. McLaughlin and C. Rockingham, oral commun., 1998). Gold-bearing quartz float was reported in the vicinity by a company prospector (J. McLaughlin, oral commun., 1998). The claims were active in 1999.

Mineral Assessment

The Scott Gold prospect is in semischist and phyllite (Brew 1997j). According to Karl and others (1999), these are Triassic Hyd Group rocks. Maps by Houston International Minerals indicate that the area bedrock consists predominately of rhyodacite with some andesite and basalt (Houston International Minerals, 1980).

The BLM's investigation of the Scott Gold prospect revealed a shallow west-trending gulch that contains quartz and silicified green volcanic rubble. In places this rubble contains sulfide bands parallel to the quartz volcanic contact along with sulfide blebs and disseminations. The sulfides consist of pyrite, galena, and sphalerite. Barite was noted in one sample (map no. 36.1, sample 9682).

A grab sample of green volcanic rubble from the gulch was unmineralized (map no. 52.9, sample 733). Three representative samples of quartz or heavily silicified volcanics from the gulch contained from 834 to 1,793 ppb gold, 826 to 2,559 ppm lead, and 9,428 ppm to 2.52 percent zinc (map nos. 52.7-52.9, samples 732, 734, 9682). Sample 9682 also contained 13.76 percent barium. It is noteworthy that a similar sample of quartz and greenstone float collected near the massive sulfide lens in the Scott prospect gulch contained 8,157 ppb gold (map no. 50.2, sample 325).

Seven stream sediment, four soil, and two rubble samples were collected to investigate the area to the west of the Scott Gold prospect. These contained up to 51 ppb gold, 211 ppm copper, and 583 ppm zinc (map nos. R191-R196, samples R725-R728, R828-R830).

Conclusions

The anomalous values in gold, lead, zinc, and barium in the rubble from the gulch; the anomalous values in gold, copper, and zinc in the reconnaissance samples; and proximity to the Scott prospect may encourage some additional exploration.

BOULDER POINT

(Figure 13, Map no. 53)

MAS no.:	0021170170	*Quadrangle:*	Petersburg C3
Deposit Type:	VMS?: Cu	*Latitude:*	56.5815
Land Status:	Open Federal	*Longitude:*	-132.9759
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location Access

The Boulder Point occurrence is at sea level on Boulder Point on the northeast side of Woewodski Island, 16 miles south of Petersburg. The topography near the occurrence is gently sloping, with brush, timber, and muskeg cover. Access can be gained by float plane or boat to Boulder Point.

History

This occurrence was discovered during this study. A literature search failed to find any indication of this occurrence.

Mineral Assessment

The Boulder Point occurrence is in the Upper Triassic Hyd Group and consists of felsic and intermediate volcanic flows and breccias, limestone, and argillite (Karl and others, 1999).

Iron-stained andesite is exposed for several hundred feet along the shore at Boulder Point. It is locally silicified. Samples collected from iron-stained silicified-andesite with pyrrhotite and chalcopyrite along fractures contained from 246 to 929 ppm copper (map. nos. 53.1, 53.2, samples 489-491).

Conclusions

Even though two BLM samples were anomalous in copper, there are not sufficient values to attract mineral exploration.

FINZENS

(Figure 13, Map no. 54)

MAS no.:	0021170172	*Quadrangle:*	Petersburg, C3
Deposit Type:	Unknown: Cu	*Latitude:*	56.5332
Land Status:	Open Federal	*Longitude:*	-133.0531
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location Access

The Finzens prospect is from ⅛ to ¼ mile west of tide water on the northeast side of Woewodski Island, 16 miles south of Petersburg. The topography is gently sloping, with brush, timber, and muskeg covering the area. Access to the property can be gained by float plane or boat to the northeast side of Woewodski Island and bushwhacking inland.

History

In their 1908 report, Wright and Wright include a map of Woewodski Island with 13 "X's" scattered over a distance of 2 miles near the eastern shore. These points are labeled Finzens Prospects (Wright and Wright, 1908). This is the only reference found in the literature concerning this prospect.

Mineral Assessment

The Finzens prospect is in the Upper Triassic Hyd Group and consists of felsic and intermediate volcanic flows and breccias, limestone, and argillite (Karl and others, 1999).

The BLM's examination of the Finzens prospect consisted of collecting stream sediment samples from prominent drainages in the area (map. nos. 54.1, 54.2, samples 493, 494, 496). These did not contain significant ore metals. Investigators collected samples from silicified schist, andesite, and basalt (map. nos. 54.1-54.4, samples 492, 495, 8740, 8741). The best value was 1,943 ppm copper (map. no. 54.2, sample 495).

Conclusions

Metal values are not sufficient to warrant additional exploration in the area.

FORTUNATE 1-3

(Figure 21, Map no. 55)

MAS no.:	0021170040	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Au, Ag, Zn, Pb	*Latitude:*	56.7197
Land Status:	State	*Longitude:*	-132.7799
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low
Alternate name:	Fortune		

Location Access

The Fortunate 1-3 prospect is on the south end of Butterworth Island (fig. 21), off the west coast of Woewodski Island. It is approximately 20 miles south-southwest of Petersburg. The mineral occurrence is located in the intertidal zone. The topography of Butterworth Island is gently sloping, with brush and timber cover. Access is by boat or helicopter.

History

The Fortunate 1-3 claims were staked for gold, silver, and iron in 1955. The northwest part of Woewodski Island, including these claims, was the site of exploration activity that was started in 1978 by Cominco, Colony Pacific, Amselco, Kennecott, and Westmin Resources (J. McLaughlin, oral commun., 1998). In 1999 it was part of the Mad Dog group of active claims.

Mineral Assessment

The southern tip of Butterworth Island consists of Mesozoic greenschist and greenstone (Brew, 1997j) that have been identified as Triassic (Karl and others, 1999). The remainder of the island is mapped as Upper Cretaceous hornblende diorite (Brew, 1997j).

The BLM's examination of the Fortunate 1-3 prospect revealed mineralized rock that is largely covered with silt and kelp in the intertidal zone. Exposures reveal silicified, iron-stained greenschist with conformable bands of sulfides from 0.075 to1.0 foot thick. These bands consist of pyrite, black sphalerite, galena, and, based on high silver content, tetrahedrite. The area of silicified volcanic rock containing the bands of sulfides is 15 feet wide and extends for 160 feet along strike. The bands strike 280° and dip 40° to the south. The mineralized exposure is covered by beach gravel immediately to the west and is not found farther to the west where hornblende diorite crops out. To the east, the mineralized zone is covered by tide water. It is not found on Woewodski Island farther east, nor on the small island to the south of Butterworth Island.

BLM personnel collected 15 samples from the more highly mineralized parts of the 15-foot-wide zone. Values ranged from 58 to 3,927 ppb gold, 43 to 630.4 ppm silver, 341 ppm to 9.76 percent lead, and from 3,951 ppm to 20.1 percent zinc (map nos. 55.2-55.6, samples 28, 29, 211, 212, 533-36, 9718-24).

Conclusions

The relatively wide mineralized zone and the substantial values in silver, lead, and zinc make the Fortunate 1-3 prospect an attractive exploration target. It is the only massive sulfide in the Duncan Canal area to contain such significant gold and silver. However, the limited extent of mineralized rock to the northeast and the likelihood that further exploring and, potentially mining, would need to be carried out under tide water discourages exploration of the prospect.

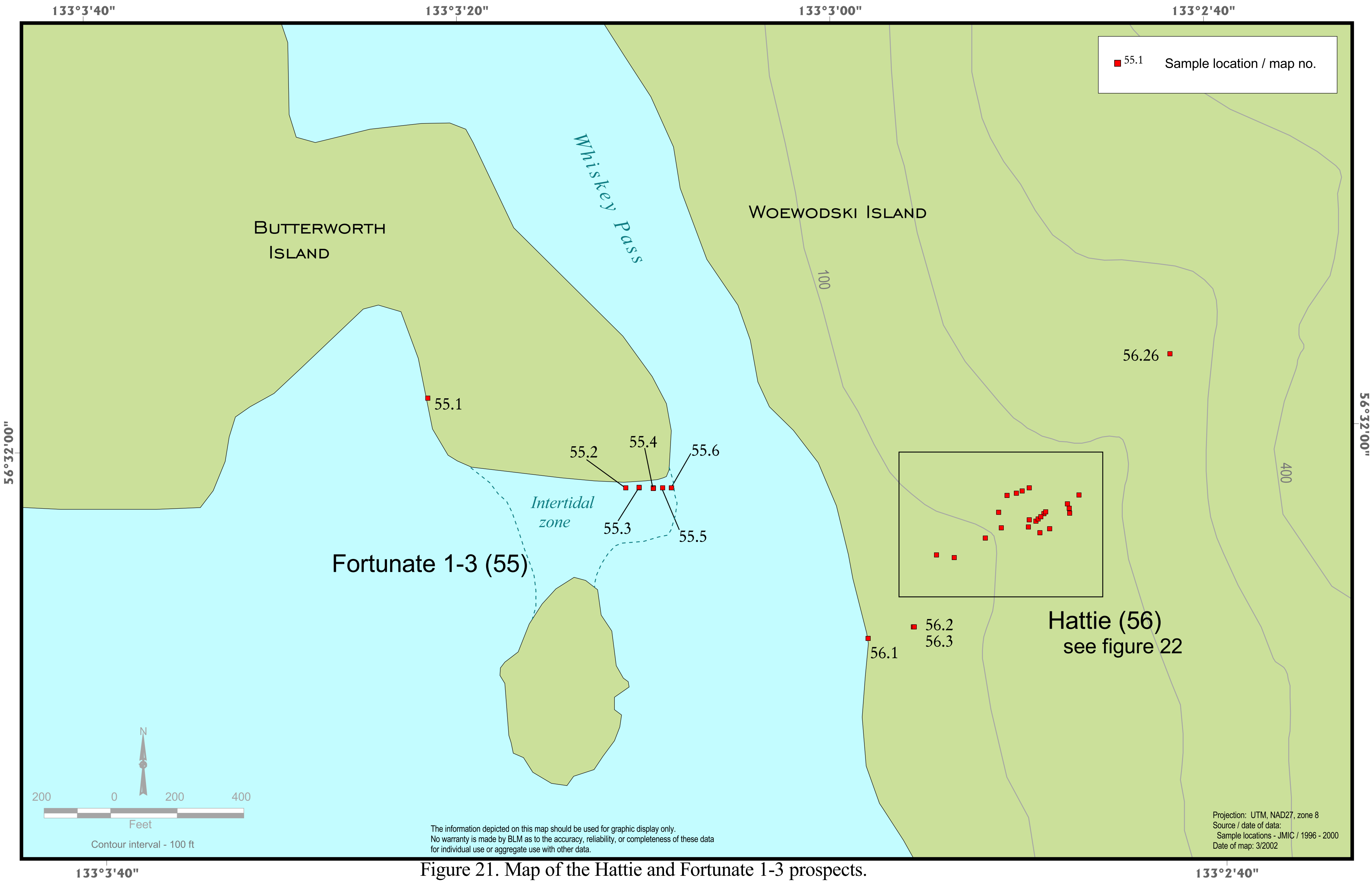


Figure 21. Map of the Hattie and Fortunate 1-3 prospects.

HATTIE

(Figures 21, 22, Map no. 56)

MAS no.:	0021170016	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au	*Latitude:*	56.5686
Land Status:	Open Federal	*Longitude:*	-133.0662
Development:	Adit, pits, cuts	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location/Access

The Hattie prospect is 20 miles south of Petersburg on the southwest side of Woewodski Island. It is 2½ miles south of the Helen S Mine (map no. 43). The prospect workings are located 500 feet from tide water at an elevation of 100 feet (fig. 21). The area topography is gently sloping, with brush, old-growth, and second-growth timber covering the area. Access can be gained by boat, helicopter, or float plane to the beach, although rough seas can preclude float plane access. A trail leads to the mine from the beach.

History

Mining activity at the Hattie prospect started in the late 1890's (Roppel, 2001). In 1900 it was staked as the property of the Olympic Mining Co. It originally consisted of 60 claims (Alaska Kardex, 117-046). Wright and Wright (1908) show the claim group extending from near sea level to over 560 feet elevation at Harrys Lake. They refer to the Hattie as the Lower Smith camp. According to Wright and Wright (1908), active exploration first started on the claims in 1901. A gold-bearing quartz breccia zone was explored by a 360-foot adit and a 135-foot winze with levels at 62 and 134 feet (photo 15). Surface developments at the property consisted of a 1,000-foot tram, a wharf, and various buildings. By 1907 the mine winze was flooded (Wright and Wright, 1908). No additional development was reported on the property, but the claims were active in 1937 (Alaska Kardex, 117-046). In 1945 J.C.

Photo 15. Geologists working inside the Hattie adit portal. Photo by P. Bittenbender.

Roehm examined the property for the Alaska Territorial Department of Mines (Roehm, 1945). In 1999 the Hattie area was included in the Mad Dog claim group.

Mineral Assessment

The Hattie prospect is in Triassic Hyd Group greenstone and greenschist (Karl and others, 1999). In the immediate prospect area, the quartz veins are hosted in greenschist that has been identified as metarhyolite by the USGS (D.J. Grybeck, oral commun., 1996). Wright and Wright (1908) report a quartz and breccia zone or vein 5 to 20 feet thick that is hosted in greenstone. The zone or vein can be traced for several hundred feet and reportedly strikes northeast and dips steeply. Pyrite, chalcopyrite, galena, and sphalerite constitute 1 to 3 percent of the vein (Wright and Wright, 1908).

In 1945 J.C. Roehm collected quartz samples from the adit dump, from a trench located near the beach, and from a cut located 2,000 feet northeast of the adit. Only the sample from the trench contained detectable gold at 0.03 oz/t. A sample from the adit across "highly mineralized schist" (altered diorite) did not contain detectable gold. Roehm also reports that some of the Hattie ore was mined and transported to the mill at the Helen S Mine (map no. 43) where it was found that the mill results were low and the ore was not amenable to amalgamation (Roehm, 1945).

The BLM's investigation of the Hattie prospect revealed a 325-foot adit with a flooded winze, a raise 65 feet long, and 4 prominent veins hosted in greenschist or diorite (fig. 22). The most northerly vein, located 90 feet north of the adit, is exposed for 90 feet in a gulch and is explored by a cut. It consists of massive quartz, up to 10 feet thick, and strikes northeast with a variable southeast dip (map nos. 56.9-56.12, samples 520, 712, 713, 9715). The portal vein is exposed for a few feet at the adit portal. It strikes northeast and dips southeast at 65°. It consists of brecciated quartz and is approximately 5 feet thick (map no. 56.7, sample 2636). The winze vein, located underground 60 feet from the adit portal, is exposed for 60 feet in the adit. It strikes north 70° east and dips 55° south. It consists of brecciated quartz and is 0.4 feet thick (map no. 56.14, sample 6956).

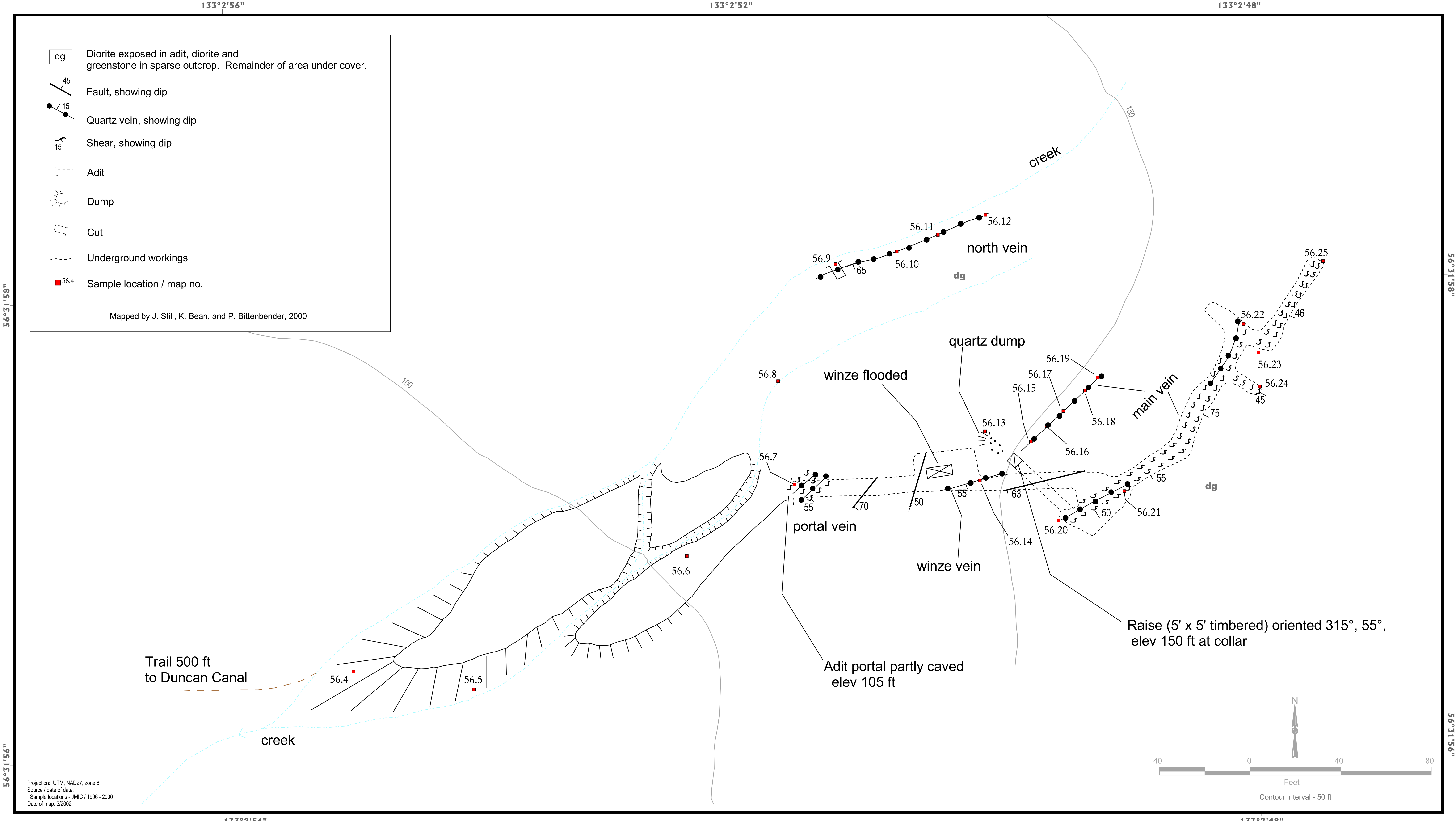
The main vein is exposed for 160 feet in the adit (map nos. 56.20-56.25, samples 6950-55), in the raise, on the surface to 60 feet northeast of the raise collar (map nos. 56.15-56.19, samples 2630-34), and in a trench located 400 feet at 250° from the adit (map nos. 56.2, 56.3, samples 715, 818). It strikes from 45° to70° and dips from 45 to 85° southeast. The main vein consists of massive to highly fractured quartz with calcite. In places it contains little quartz and consists predominately of fractured, iron-stained, bleached diorite. It ranges from 5 to 20 feet thick.

BLM personnel also collected samples from the raise dump (map no. 56.13, sample 519), from the adit dump (map nos. 56.4-56.6, samples 27, 512, 8750), and from veins exposed on the beach in line with the main vein trend (map no. 56.1, samples 518, 9714). In all, 27 samples were collected from the Hattie prospect veins and dumps. One sample of the main vein contained 134 ppb gold (map no. 56.20, sample 9650); all the rest contained less than 37 ppb gold. The silver, copper, lead, and zinc values are all very low as well.

Conclusion

The historic description of the mineral occurrence at the Hattie prospect sounds very similar to that of the Helen S Mine (map no. 43). Previous investigators have expressed confusion between the descriptions of the Helen S Mine and Hattie prospect (Grybeck and others, 1984).

The BLM's examination of the veins, dumps, and adits at the Hattie prospect failed to reveal significant gold values. The highest-grade sample, 134 ppb gold, would not make the cutoff grade in most large open pit gold mines. If gold was mined at this prospect, it was from small shoots, and mining has removed the evidence of such. Sampling indicates that the Hattie veins do not contain significant gold mineralization and are not exploration targets.



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for individual use or aggregate use with other data.

Figure 22. Map of the Hattie prospect.

INDEPENDENCE

(Figure 13, Map no. 57)

MAS no.:	0021170181	*Quadrangle:*	Petersburg C4
Deposit Type:	Vein: Au	*Latitude:*	56.7401
Land Status:	Open Federal	*Longitude:*	-133.2443
Development:	Shaft, trenches	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location Access

The Independence prospect is on the northwest side of Woewodski Island, 17 miles south-southwest of Petersburg. The topography is gently sloping, with brush, timber, and muskeg covering the area. Access to the property can be gained by float plane or boat to the Helen S Mine (map no. 43), and from there, a trail leads to Harvey Lake, elevation 90 feet. Bushwacking along the south side of Harvey Lake leads to a stream that drains Harrys Lake, elevation 600 feet. The four Independence claims trend south from Harvey Lake to Harrys Lake. Trenches and a shaft are located in or near the stream that connects the two lakes.

History

The Independence prospect is briefly mentioned in a 1931-dated report, which shows four claims between Harvey and Harrys lakes (Nelson, 1931). A hand-drafted map given to the BLM by a Petersburg resident depicts the northwest end of Woewodski Island and also shows four claims extending along the drainage between Harrys and Harvey lakes. This map, dated August 1933, was compiled from other old records and maps by an unknown author (Northwest Woewodski, 1933).

Mineral Assessment

The Independence prospect is in the Upper Triassic Hyd Group (Karl and others, 1999) and consists of felsic and intermediate volcanic flows and breccias, limestone, and argillite. Near the south end of the property, hornblende diorite intrudes the volcanic flows (Brew, 1997j).

The 1931 report describes a north-south striking, east-dipping, 3- to 10-foot-thick quartz vein traced by 5 cuts and an old water-filled shaft along a distance of 1,800 feet (Nelson, 1931). Eight samples collected across the vein ranged in length from 36 to 60 inches and assayed from 0.01 to 0.003 oz /t gold (Nelson, 1931).

The 1933 map shows 12 cuts and a shaft located along the drainage on the three southernmost claims. The map indicates that the shaft is 10 to 20 feet deep and notes “reported to go 8.00 ounces.” Five samples collected across the vein ranged in length from 2.5 to 11.0 feet and, according to the notes, contained from “0.01 to 0.48" again with no units specified. However, the map indicates either ounces of gold or dollars for other prospects (Northwest Woewodski, 1933).

BLM personnel followed the outlet stream from Harrys Lake to Harvey Lake, a distance of approximately 6,000 feet. North-striking, steeply east-dipping quartz veins and lenses were found in the stream's vicinity through elevations of 550 to 350 feet and for a distance of approximately 2,000 feet. The shaft indicated by earlier reports was found at an elevation of 500 feet. It is flooded to the collar, which measures 5 feet by 5 feet. Quartz samples were collected from the shaft dump, from outcrops, and from rubblecrop (map. nos. 57.1-57.5, samples 497-501, 8742-44). In most cases the width of the quartz vein or lens was only partly exposed and samples were only collected from the exposed parts of the vein. Of the eight samples collected, six contained less than 5 ppb gold, one contained 74 ppb gold (map no. 57.3, sample 8744), and another 94 ppb gold (map no. 57.3, sample 8743).

Conclusions

The Independence prospect consists of a fissure zone containing veins and lenses of quartz up to 10 feet thick that are continuous for at least 2,000 feet. The eight BLM samples collected from the veins do not contain significant gold. The highest gold assay reported from the eight samples of Nelson (1931) was only 0.01 oz/t. The BLM and Nelson (1931) gold values are well below a grade necessary to attract exploration interest.

MAD DOG 2

(Figure 13, Map no. 58)

MAS no.:	0021170183	*Quadrangle:*	Petersburg C4
Deposit Type:	VMS: Au, Ag, Zn, Cu	*Latitude:*	56.5653
Land Status:	Open Federal	*Longitude:*	-133.0321
Development:	2 DDH, cut	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Mad Dog 2 prospect is on Woewodski Island, 18 miles south of Petersburg. It is located southeast of Harvey Lake, along a small, stream-formed gulch at an elevation of 400 feet. The area is moderately steep, with muskeg, brush, and timber covering the site. Access is via float plane to Harvey Lake and bushwhacking to the site or by helicopter.

History

The Mad Dog 2 prospect (and most of the northwestern part of Woewodski Island) was staked during the late 1970's and early 1980's. Cominco, Colony Pacific, Amselco, Kennecott, and Westmin Resources were all active in the area sometime between 1978 and 1998 (J. McLaughlin and C. Rockingham, oral commun., 1998). A Petersburg resident now holds the claims covering the Mad Dog 2 prospect. The claimant drilled two shallow diamond drill holes on the claims in 1998 (P. Beardslee, oral commun., 1999).

Mineral Assessment

The Mad Dog 2 prospect is located in Triassic Hyd Group volcanic flows and breccia (Karl and others, 1999).

The BLM's investigation of the prospect revealed a sulfide band conformably hosted in iron-stained schist at an elevation of 360 feet. It is exposed in the northwest bank of a small creek. The sulfide band ranges in thickness from 0.3 to 0.8 feet, strikes 035°, and dips 45° to the southeast. It contains pyrite, chalcopyrite, and sphalerite. A small excavation for a drill platform and a cut in the bank of the creek expose this band for 25 feet along strike.

BLM personnel collected six samples from the sulfide band. They contained from 67 to 2,867 ppb gold, from 2.4 to 27.1 ppm silver, from 240 to 1,512 ppm copper, and from 732 ppm to 2.9 percent zinc (map nos. 58.1, 58.4, samples 344-347, 9570, 9702). The diamond drill hole was collared just below this sulfide band and failed to encounter significant mineralized rock. Another drill hole, collared 260 feet at 030° from this hole, also failed to encounter significant mineralized rock. Investigation and sampling up the small creek to an elevation of 450 feet revealed no notable mineralized rock (map nos. 58.2, 58.3 samples 349, 350). However a stream sediment sample from the same creek contained anomalous zinc at 314 ppm (map no. 58.5, sample 348).

Conclusions

The Mad Dog 2 prospect contains interesting values in gold, silver, copper, and zinc. However, the two drill holes failed to encounter significant mineralized rock. The Triassic rocks in the area are worthy of additional examination.

BRUSHY CREEK

(Figure 13, Map no. 59)

MAS no.:	0021170175	*Quadrangle:*	Petersburg, C4
Deposit Type:	VMS: Zn, Pb, Ag	*Latitude:*	56.5203
Land Status:	Open Federal	*Longitude:*	-133.0165
Development:	Cuts, soil grids	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Brushy Creek prospect is on the south end of Woewodski Island, 21 miles south of Petersburg. The topography is moderately sloping, with brush and timber covering the area. Access to the prospect can be gained by boat to the south side of Woewodski Island and then on foot, a quarter of a mile to the first outcrops, or by helicopter to muskegs near the eastern end of the prospect.

History

Westmin Resources was active in the Brushy Creek area during 1996 (C. Rockingham, oral commun., 1998). Recently flagged surveying grids on the prospect indicate detailed work in the area (possibly soil sampling or geophysical surveying). There are no published reports on this prospect.

Mineral Assessment

The Brushy Creek prospect is in Mesozoic greenschist and greenstone near its contact with Upper Cretaceous hornblende diorite (Brew, 1997j). According to Karl and others (1999), the greenstone and greenschist are Triassic Hyd Group volcanic rocks.

The BLM's investigation revealed a series of cuts in bluffs on the south side of a narrow creek. The creek, which follows a shear zone, trends 075° to 085°. The foliation in the hosting greenstone schist trends 055° to 085° and dips from 15° to 40° to the southeast. Five cuts that expose iron-stained, mineralized rock were examined and sampled. The cuts range in elevation from 90 feet to 170 feet and are scattered along a distance of 3,000 feet. The continuity of units between the cuts was not determined. Mineralized rock consists of disseminated, thinly banded sulfides hosted in silicified, calcareous volcanics. The sulfides are pyrite, sphalerite, and galena.

BLM personnel collected nine samples. The best sample was a 2-foot chip that contained 423 ppb gold, 27.9 ppm silver, 7,380 ppm lead, and 2.6 percent zinc (map no. 59.2, sample 195). Six of the remaining samples contained from 1,735 ppm to 2.2 percent zinc (map nos. 59.3-59.5, samples 190-192, 194, 9636, 9637).

Conclusions

Mineralized rock at the Brushy Creek prospect is scattered over a distance of 3,000 feet and contains interesting silver, lead, and zinc values. These factors make the Brushy Creek prospect a potential exploration target.

OLYMPIC RESOURCES GOLD

(Figure 23, Map no. 60)

MAS no.:	0021170174	*Quadrangle:*	Petersburg C3
Deposit Type:	Unknown: Au	*Latitude:*	56.5200
Land Status:	Open Federal	*Longitude:*	-131.7600
Development:	7 DDH, soil grids	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location/Access

The Olympic Resources Gold prospect is located 3,400 feet north of the south tip of Woewodski Island, 21 miles south of Petersburg at an elevation of 400 feet. The topography is moderate with muskeg, brush, and timber covering the area. Access to the prospect can be gained by boat to the south end of Woewodski Island and then by foot, 0.65 miles, or by helicopter to muskegs near the prospect.

History

Whereas the north end of Woewodski Island includes numerous prospects that have received exploration activity, the south end is less explored and until 1999 had no reported prospects. During 1999 Phil Beardslee of Petersburg was conducting mineral exploration near the south end of Woewodski Island as a representative of the Olympic Resources Group. He collected samples on a 700-by-1,000-foot grid that he reported contained significant gold (P. Beardslee, oral commun., 1999).

Mineral Assessment

The Olympic Resources Gold prospect is in Mesozoic greenschist and greenstone near its contact with Upper Cretaceous hornblende diorite (Brew, 1997j). According to Karl, the greenstone and greenschist are Triassic Hyd Group volcanic rocks (Karl and others, 1999).

A shallow gully with an intermittent stream flowing in a southerly direction runs down the center of the initial Olympic Resources discovery grid. Glacially derived, blue-gray clay, deposited about 10,000 to 15,000 years ago, covers most of the area bedrock. The C soil horizon is poorly developed in most locations. A mat of muskeg, brush, and tree roots covers the area.

The initial discovery resulted from 25 soil samples, with a spacing of 25 to 480 feet, collected across a grid covering approximately 700 by 1,000 feet. These samples ranged in value from 65 to 9,510 ppb gold with a median value of 1,150 ppb. They contained up to 2.2 ppm silver, but no other significant metal values. These samples were collected with a post hole digger, oven dried, and hand crushed at Mr. Beardslee's Petersburg residence. Olympic Resources Group subsequently established extensive grids in the area and collected hundreds of soil samples along these grids. Sample results indicate an area as large as 1,500 feet by 5,000 feet that might contain anomalous gold concentrations (P. Beardslee, oral commun., 1999)

In some areas the more recent grids overlapped the original discovery grid. In the overlap areas, gold sample values from the more recent grids were orders of magnitude lower than the original respective samples. At the request of the BLM, Olympic Resources Group re-ran the 25 original grid samples for gold. This re-run indicated very high gold values similar to the original analysis.

The BLM asked Olympic Resources Group for the opportunity to replicate some of the original discovery grid samples. This was accomplished in late October 1999 with the aid of B. Zorich of Olympic Resources Group (photo 16). Sixteen original grid samples were replicated. Some were replicated by auguring through the bottom of the originally dug post hole. Others were replicated from both the original post hole and from a second hole augered nearby. In all, 26 samples were collected–21 soil, 3 rock, 1 stream sediment, and 1 pan concentrate (fig. 23). These samples contained from less than 5 ppb to 74 ppb gold, which is orders of magnitude lower in gold than the original 25 grid samples reported by Olympic Resources Group (map nos. 60.5-60.9, 60.11-60.20, samples 658-83). Two of the soil samples were anomalous in both gold and arsenic, with values of 67 and 74 ppb gold and 122 and 123 ppm arsenic (map nos. 60.19, 60.20, samples 664, 665). Four were anomalous in arsenic only, with values from 108 to 491 ppm arsenic (map nos. 60.13, 60.18, samples 660-62, 682).

All the soil and stream sediment samples collected by the BLM were sieved to -80 mesh. To insure that coarse gold was not missed in the +80 fraction, the +80 rejects of the 21 soil samples that were collected in 1999 from the original grid area were ground and sieved for coarse gold and then fire assayed. The results did not indicate any significant difference in gold values between the +80 rejects and -80 originally sieved samples; neither contained significant quantities of gold.

Late in 1999, Avalon Development Corporation replicated 14 of the original discovery grid samples with a power auger. Their results were similar to those of the BLM–almost two orders of magnitude lower than the very high gold sample values obtained from the Olympic Resources samples (B. Zorich, oral commun., 1999).

In the Spring of 2000, the BLM collected additional samples from the original grid area. Eight rock, five stream sediment, and three soil samples were collected from or near the stream that traverses the original grid (map nos. 60.5, 60.10, 60.13, 60.19, 60.21, 60.22, 60.24, samples 694-700, 762, 763, 801-05, 854, 855). Three of these samples were anomalous in gold and arsenic; two were rock samples, and one was a soil sample. The two rock samples were collected from silicified, grey-white greenstone containing disseminated pyrite exposed for a few feet in the west stream bank. These samples contained from 94 to 730 ppb gold and from 1,374 to greater than 10,000 ppm arsenic (map no. 60.13, samples 802, 854). A soil sample collected near the rock samples was anomalous at 94 ppb gold and 458 ppm arsenic (map no. 60.10, sample 694). Five other samples were anomalous in arsenic with values from 97 to 247 ppm arsenic (map nos. 60.19, 60.21, 60.23, 60.24, samples 699, 700, 763, 803, 805).

Samples were collected north and south of the original grid. Five samples were collected from 200 to 700 feet north of the grid (map nos. 60.1-60.3, samples 690-93, 800). One, a soil sample, was anomalous in gold at 293 ppb (sample 693). At a location 300 feet south of the original grid and from the same stream that traverses the original grid, a stream sediment sample was anomalous in arsenic at 158 ppm (map no. 60.26, sample 765). A sample of quartz float that was collected 100 feet south of the grid and rock samples from iron-stained volcanics or quartz veinlets that were collected near sea level at locations 2,900 to 3,400 south and southeast of the original grid did not contain significant metal values (map nos. 60.27-60.30, samples 766, 767, 856, 857).

Olympic Resources Group conducted additional exploration work in the vicinity of the original grid during 2000. They drilled 7 holes with depths to 225 feet. The last hole cored 200 feet of white bleached, pyritized, silicified, greenstone similar to that found at map no. 60.13, where BLM samples 802 and 854 were anomalous in gold and arsenic. Olympic Resources Group submitted samples from the core for analysis; the results are reportedly not favorable (P. Beardslee, oral commun., 2001).

Conclusions

The extent of the original grid, 700 to 1,000 feet, and high gold values, 65 to 9,510 ppb, reported by Olympic Resources Group initially indicated a significant exploration target. Subsequent replication of the group’s sampling by the BLM and Avalon Development Corporation indicated gold values that are orders of magnitude lower than those obtained by Olympic Resources Group. There is sufficient repeat replication and metallic sieve analysis to indicate that the high gold values do not exist on the ground. Only 5 of 41 samples that were collected by the BLM within the original grid contained anomalous gold. These five ranged from 67 to 730 ppb gold. The cause of this discrepancy between Olympic Resources Group samples and the Avalon/BLM samples is unknown.

Photo 16. Petersburg prospector Bob Zorich standing in the creek that drains the original discovery grid at the Olympic Resources Gold prospect. Photo by J. Still.

Whereas there are no high gold values, there are some modest gold anomalies and 15 of the 42 samples collected in the area of the original grid were anomalous in arsenic, with values ranging from 97 to 10,000 ppm arsenic. Limited bedrock sampling indicates that silicified, grey-white greenstone with disseminated pyrite may be the source for these modest gold and arsenic anomalies. The altered greenstones in the vicinity of the original grid may be worthy of additional exploration.

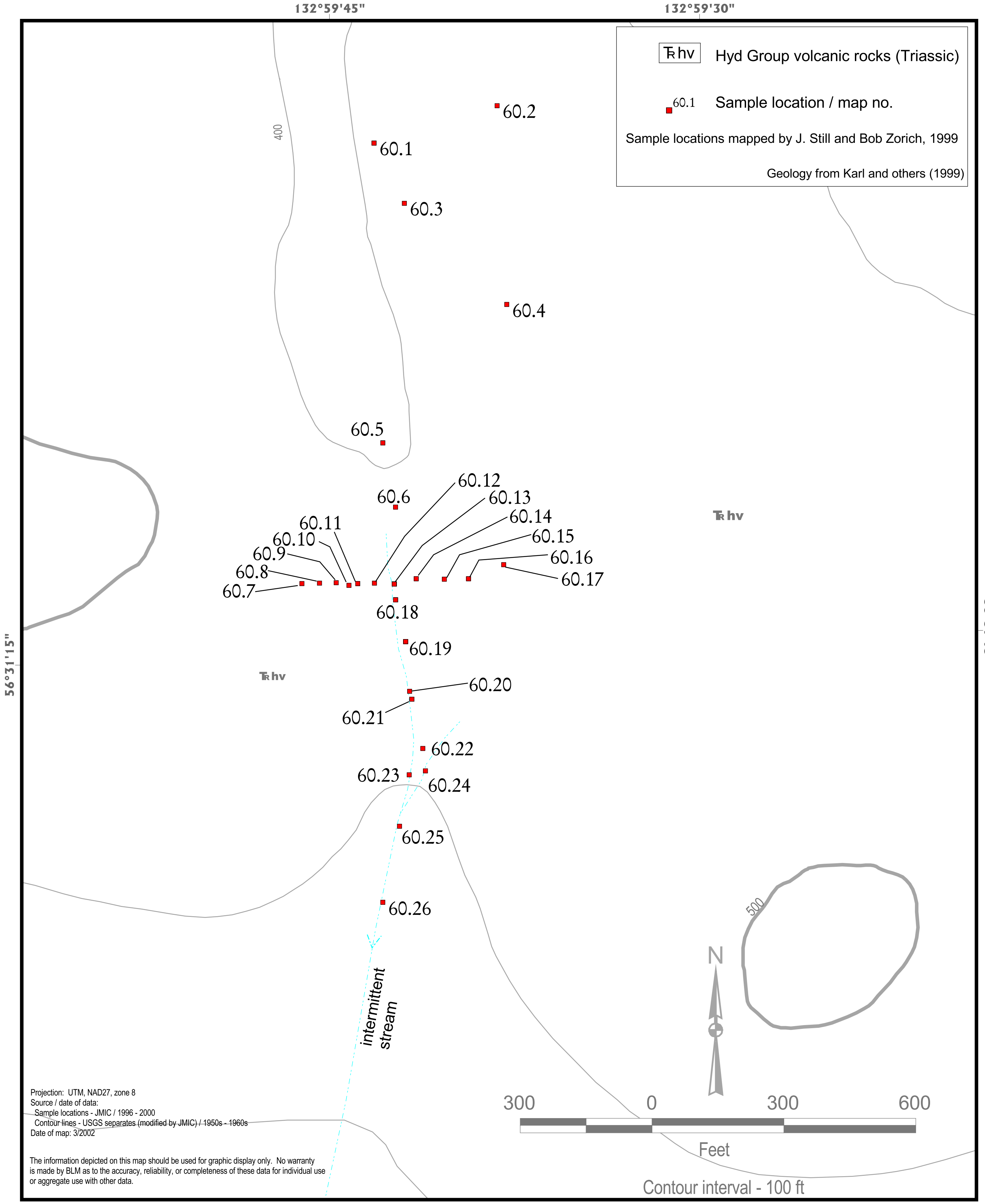

Figure 23. Map of the Olympic Resources Gold prospect.

MITKOF ISLAND

FREEL & DURHAM

(Plate 1, Map no. 61)

MAS no.:	0021170041	*Quadrangle:*	Petersburg C3
Deposit Type:	Unknown: Au	*Latitude:*	56.7197
Land Status:	Open Federal	*Longitude:*	-132.7798
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Freel & Durham prospect is on the east side of Mitkof Island, 9 miles southeast of Petersburg. The site is in an unnamed drainage 1½ miles west of Frederick Sound and a mile northeast of the head of Falls Creek. The drainage bottom is covered by large, mature timber, but the drainage passes through a 3-square-mile area predominated by muskeg. The prospect's location averages 170 feet in elevation. Access can be gained by driving Forest Service road 6204 and then walking about a mile downhill to the southeast, across muskeg, to the drainage containing the claim.

History

The earliest known record of activity in the Freel & Durham area is the staking of a mining claim for lode gold in 1957 (Alaska Kardex, 117-058). BLM investigators found no other record of activity in the published literature, nor did they find signs of mining activity in the area during a site visit in 1998.

General Assessment

The Freel & Durham prospect lies within metamorphosed Upper Cretaceous, Stephens Passage Group rocks. The rocks associated with this unit are schist and hornfels (Brew, 1997i).

BLM personnel searched the location described in the records (Alaska Kardex, 117-058), but could find no outcrop in the area. They collected six samples from stream branches that drain the area–three stream sediment and three quartz float samples (map no. 61.1, samples 399, 400, 2815-18). The samples had low precious and base metal values.

Conclusions

Not enough is known about the Freel & Durham prospect to make definitive conclusions. However, the paucity of information and lack of evidence of mining activity suggest the prospect is of little significance.

ROAD SHOW

(Plate 1, Map no. 62)

MAS no.:	0021170042	*Quadrangle:*	Petersburg C3
Deposit Type:	Placer: Au	*Latitude:*	56.6675
Land Status:	Open Federal	*Longitude:*	-132.7109
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Road Show prospect is on the east side of Mitkof Island, 14 miles southeast of Petersburg. Located on a southeastern tributary of Big Creek, which empties into Frederick Sound, the site is immediately upstream from where Forest Service road 6235 crosses the tributary. The terrain is moderately steep and covered with conifer forest, however much of the forest nearby has been clearcut.

History

The Road Show prospect was staked for placer gold by Steve Homer and Annie Taylor in 1972 and held through 1973 (Alaska Kardex, 117-079). No other record of activity is known in published literature, nor was there any sign of mining activity found during the BLM's site examination.

Mineral Assessment

The Road Show prospect lies within Upper Cretaceous intrusive rocks of the Admiralty-Revillagigedo Plutonic Belt of Brew and Morrell (1983). The rocks associated with this unit in the Mitkof Island area are hornblende-biotite tonalite, granodiorite, quartz monzodiorite, and quartz diorite (Brew, 1997i).

BLM personnel examined the Road Show prospect area in 1998 and collected one pan concentrate, one grab sample of quartz vein float, and two stream sediment samples (map no. 62.1, samples 401, 402, 2819, 20). Investigators found no outcrops in the area of the prospect. Float consists of metamorphosed sediments, metamorphosed volcanics, and quartz diorite. The float did not contain metallic minerals. The samples contained insignificant values for any elements of economic interest.

Conclusions

The insignificant metal values, the absence of evidence of prospecting activity, and the lack of published information about the Road Show prospect suggest the site is of little economic importance.

DECEMBER POINT

(Plate 1, Map no. 63)

MAS no.:	0021170171	*Quadrangle:*	Petersburg C-3
Deposit Type:	Vein: Sb	*Latitude:*	56.5485
Land Status:	Open Federal	*Longitude:*	-132.9587
Development:	Trench	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

December Point is located on the east side of Wrangell Narrows between Woewodski and Mitkof Islands, 2¾ miles north of Point Alexander and the southern end of the Narrows. It is 18 miles south of Petersburg. Access to the area is easy by boat. Float plane access is possible as well as helicopter access at low tide.

History

Reference to an antimony occurrence at December Point is first made by Roehm in 1943 in which he describes receiving samples of antimony-bearing rock from Harry Colp of Petersburg (Roehm, 1943). In 1945 Roehm examined the prospect and wrote a brief report. He describes an "old" open cut, but provides no additional history (Roehm, 1945).

Mineral Assessment

Roehm (1945) describes the December Point antimony prospect as occurring in a reddish colored granite with fractures controlling the presence of stibnite. He describes the fractures as appearing as dark streaks and that needle-like crystals of stibnite occur in the fractures and slightly into the granite. He could not determine the extent of the mineralized zone, but says mineralized rock extends from tidewater to cover on the beach. Analysis of a sample submitted to Roehm's office from December Point reportedly showed 13.9 percent antimony with traces of gold and silver. Analytical results from a sample collected by Roehm from the occurrence he describes is not included in his report (Roehm, 1945).

BLM investigators did not locate the 25-foot trench described by Roehm (1945), and judging from analytical results that lack significant antimony, the December Point occurrence may not have been found. BLM investigators did find reddish-colored intrusive rock in the December Point area that Karl and others (1999) have mapped as tonalite. The tonalite is cut by fracture sets that appear as dark streaks. Fine-grained pyrite is associated with very fine grained, dark gray to black, carbon-rich(?) material that makes up the dark streaks. This fine-grained material also occurs in masses, wisps, and disseminations, particularly in silicified parts of the tonalite.

Analytical results from samples collected by the BLM at December Point revealed only minor amounts of antimony. The highest antimony value was 141 ppm (map no. 63.1, sample 3916). Most of the BLM's samples from the area contained elevated arsenic and mercury, with the highest values being 1,420 ppm arsenic, and 18.68 ppm mercury (map no. 63.1, sample 3916). Precious and base metal concentrations were either very low or below detection limits.

Conclusions

It is likely that BLM investigators did not find the historic December Point prospect. On the other hand, Roehm (1945) may not have found the prospect either. He apparently found what he believed to be a 25-foot trench, but since the analytical results for the sample he collected are not available, he may not have found the antimony occurrence. In any case, judging from the descriptions provided by Roehm (1943; 1945) and the BLM's investigation of the area, the occurrence is probably of little significance, mainly because precious metal concentrations are low. The occurrence may be of significance in indicating the potential for a larger, epithermal mineralizing event in the area, but there are few additional indicators of this.

MITKOF ISLAND, FS RD 6245

(Plate 1, Map no. 64)

MAS no.:	0021170173	*Quadrangle:*	Petersburg C-3
Deposit Type:	MS: Cu, Pb, Zn	*Latitude:*	56.5200
Land Status:	Open Federal	*Longitude:*	-132.7607
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Mitkof Island, FS Road 6245 occurrence is in a borrow pit, 20 miles south-southeast of Petersburg. The pit is on Forest Service Road 6245, at an elevation of 120 feet and within a quarter of a mile of the shoreline of Blind Slough on Sumner Strait. The terrain is moderately steep and the pit is surrounded by conifer forest. Access is by road.

History

While doing a reconnaissance examination of the road cuts and borrow pits on Mitkof Island, BLM personnel discovered iron-stained rubble containing massive pyrrhotite in a borrow pit. The pit had been used for fill and road surfacing of logging roads in the area, and as such, all production was for that purpose (Forest Service, oral commun., 1998). There is no published reference to this site, other than as a source for rock.

Mineral Assessment

The FS Road 6245 pit occurrence lies within a belt of Upper Cretaceous intrusive rocks. The rocks associated with this belt are hornblende-biotite tonalite, granodiorite, quartz monzodiorite, and quartz diorite (Brew, 1997i).

BLM personnel collected one sample of iron- and copper-stained rubble containing massive pyrrhotite in hornblendite. The sample contained 1,007 ppm copper, 303 ppm lead, and 395 ppm zinc (map 64.1, sample 391).

Conclusions

The BLM's examination of the FS Road 6245 pit indicates a small, low-grade occurrence. Mineralized rock was only found in rubble, and the analytical result showed low metal values.

ZAREMBO ISLAND AND VICINITY

Property name — Plate 1, Map no.

Zarembo Island, FS Rd 52009

(Plate 1, Map no. 65)

MAS no.:	0021170160	*Quadrangle:*	Petersburg B3
Deposit Type:	Vein: Au	*Latitude:*	56.4240
Land Status:	Open Federal	*Longitude:*	-132.9841
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Zarembo Island, FS Road 52009 occurrence is on the northwest side of Zarembo Island on Forest Service Road 52009, half a mile southwest of St. John Harbor. It is 24 miles west of Wrangell. The area topography is gently sloping and covered with second-growth timber and thick brush. Access to the site is by boat or float plane and then on foot, or by helicopter.

History

BLM personnel discovered the Zarembo Island, FS Road 52009 occurrence during this study.

Mineral Assessment

The Zarembo Island, FS Rd 52009 occurrence is in an area of Quaternary and Tertiary rhyolite (Karl and others, 1999).

The BLM's investigators found vuggy and drusy quartz and purple fluorite scattered in road fill. The rocks are similar to the Zarembo Island Fluorite occurrence (map no. 69), which is located 11 miles to the south. A grab sample of more sulfide rich quartz and flourite from the road fill contained 546 ppb gold and 826 ppm arsenic (map no. 65.1, sample 9651). The road fill appears to be near its place of origin; however, mineralized rocks were not found in outcrop.

Conclusions

There is insufficient indication of mineralization at the Zarembo Island, FS Rd 52009 occurrence to attract exploration interest.

FRENCHIE

(Figure 24, Map no. 66)

MAS no.:	0021170055	*Quadrangle:*	Petersburg B3
Deposit Type:	VMS: Zn, Cu, Ag, Pb	*Latitude:*	56.4855
Land Status:	Open Federal	*Longitude:*	-132.0344
Development:	Adit, 8 DDH	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	High
Alternate name: St. John Harbor			

Location/Access

The Frenchie prospect is on Zarembo Island half a mile south of the head of St. John Harbor. It is 22 miles west of Wrangell. The area topography is gently sloping and is covered with second-growth timber and thick brush; however, the prospect itself is located between 15-foot-high creek banks. It can be reached by following upstream the northern branch of the creek that flows into the southwest side of St. John Harbor. Access is by boat or float plane to St. John Harbor and then by foot up the creek. Alternate access is by helicopter, but this would require a difficult landing in the creek upstream from the occurrence.

History

The Frenchie prospect was first described by Buddington (1923) who visited it in 1921. He describes it as a 7.5-foot-thick, shallow-dipping, conformable, tabular layer of pyrite hosted in siliceous schist. The pyrite layer is exposed along the creek for a length of 130 feet and is explored by an adit 100 feet long and a shaft located approximately 100 yards north of the adit (Buddington, 1923).

In 1978 BP Alaska Exploration staked 34 claims, mapped and sampled the prospect, and recognized its importance as a strata-bound, massive sulfide deposit. In 1979 the company conducted a helicopter EM and magnetic survey, stream sediment and soil sampling, and follow-up ground geophysics over the 10 square miles of ground that contained the deposit and its host rocks (Brewer, 1979).

By the early 1980's, the USGS considered the Frenchie prospect "largely forgotten" and unrecognized as a volcanogenic massive sulfide deposit, but they later became the first to "relocate its prominent outcrop along the creek bank" and to rediscover it as a volcanogenic massive sulfide deposit (Grybeck and Berg, 1998).

In 1984 three holes were drilled on the Frenchie prospect. In 1996 Westmin Resources drilled another five holes (Rockingham, 1996).

Mineral Assessment

The Frenchie claim block occupies an 8-by-3-mile area in the central valley of Zarembo Island, which consists of Triassic Hyd Group and Permian and Mississippian Cannery Formation rocks

(Karl and others, 1999). "Throughout the area, fine-grained, weakly metamorphosed, argillaceous sediments and minor argillaceous limestone predominate. Tuffaceous interbeds, tuffs, and massive to weakly foliated hornblende andesites are common locally (Brewer, 1979)."

The massive sulfide mineralized band at the Frenchie prospect is conformably hosted in silicified graphitic phyllite, argillite, and lesser slate, chert, and argillaceous limestone. These units strike west-northwest and dip 15° to 20° to the southwest (fig. 24). Where exposed, the footwall consists of siliceous, pale green quartz-muscovite phyllite. The hanging wall consists of a thin layer of black phyllite and up to 18 inches of pale, siliceous argillite and chert with up to 10 percent pyrite and sphalerite. Above this hanging wall, pyritized argillite and schist predominate to the top of the cliff, a distance of 15 feet (Brewer, 1979).

The massive sulfide mineralized band is exposed near the base of cliffs on either side of the creek that follows the strike of the band. The band is up to 6.5 feet thick and is exposed for 460 feet along the creek. The western limit is obscured by cover, and the eastern limit is defined by a fault. "The massive sulfide band consists of 20 to 35 percent fine-banded pyrite, subordinate pyrrhotite, and minor sphalerite, galena, and chalcopyrite in a quartz-barite gangue. Barite varies between 5 and 20 percent (Brewer, 1979)." Thirteen samples were collected across the sulfide band at locations along its 460-foot length. They averaged 0.047 oz/t gold, 0.42 oz/t silver, 0.55 percent copper, 0.08 percent lead, and 1.48 percent zinc (Brewer, 1979).

BP Alaska Exploration conducted a helicopter EM and magnetic survey with a spacing of $^{1}/_{5}$ mile over the Frenchie deposit and its host rocks. One line, specifically flown over the Frenchie massive sulfide band to determine its signature, gave a weak electromagnetic response. The remaining area gave a number of low-ranking responses. Soil and stream sediment sampling, and in some cases ground geophysics, were used to follow up these anomalies. The results were negative (Brewer, 1979).

The BLM's investigation of the Frenchie prospect was confined to examining the massive sulfide band. The results of the examination verified the work and descriptions done by BP Alaska Exploration. A shallow-dipping sulfide band that averages 5 feet thick is exposed along a creek for a distance of 460 feet. A 35-foot-long, partly flooded adit is driven into the sulfide zone. The shaft described by Buddington (1923) was not found. Chip samples from the sulfide band and from within the general vicinity contained up to 1,204 ppb gold, 16.1 ppm silver, 5,453 ppm copper, 3,973 ppm lead, 4.9 percent zinc, and 2,406 ppm arsenic (map nos. 66.3-66.6, samples 17-18, 305, 9660, 9662). The average of eight chip sample lines across the massive sulfide band was 0.019 oz/t gold, 0.32 oz/t silver, 0.25 percent copper, 0.16 percent lead, 2.4 percent zinc, and 0.08 percent arsenic (map nos. 66.1-66.8, samples 17-18, 207, 305, 308, 2616-17, 9662). These results compare well with the numbers obtained by BP Alaska Exploration (Brewer, 1979).

Conclusions

The Frenchie deposit, as it is now known, is too small and too low-grade to be considered for development. Further exploration down dip, along the massive sulfide band, or of the Triassic rocks in the vicinity might reveal a larger, higher-grade deposit. However, the lack of a distinctive geophysical signature will hamper further exploration.

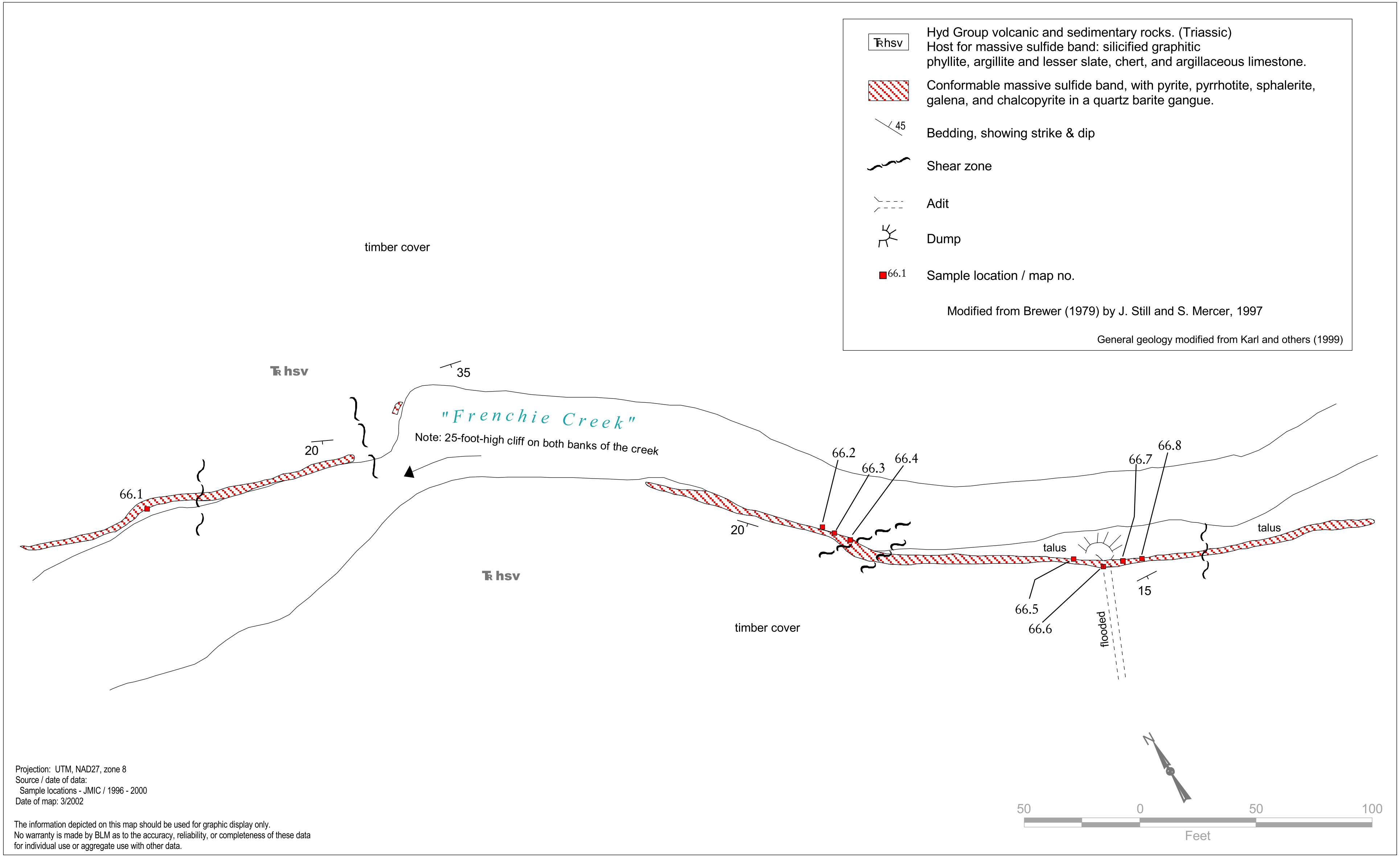

Figure 24. Map of the Frenchie prospect.

LOST ZAREMBO

(Plate 1, Map no. 67)

MAS no.:	0021170152	*Quadrangle:*	Petersburg B3
Deposit Type:	VMS: Zn, Cu, Pb, Ag	*Latitude:*	57.3267
Land Status:	Open Federal	*Longitude:*	-133.0850
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium
Alternate name:	Spiderman		

Location/Access

The Lost Zarembo prospect is on Zarembo Island, in a borrow pit 6 miles from St. John Harbor along Forest Service Road 6590. It is 21 miles west-southwest of Wrangell. The area is covered with second-growth timber and thick brush. Access to the prospect is by boat or float plane and foot, or by helicopter.

History

The Lost Zarembo prospect was first described by Grybeck and others in 1984 as a Triassic volcanogenic massive sulfide deposit that consists of three massive sulfide layers hosted in orange-weathering, greenish gray metarhyolite. The most prominent sulfide layer is 3.5 feet thick and extends for 45 feet (Grybeck and others, 1984). A brief ATNA Resources, Inc. report calls the prospect the Spiderman and describes exploration surveys (geophysical) in the area as inconclusive (DeLancey,1990).

Mineral Assessment

The Lost Zarembo prospect is in an area mapped as Quaternary and Tertiary rhyolite (Karl and others, 1999). The occurrence itself is hosted in a small fault block of Triassic volcanic rocks (Grybeck and others, 1984).

The BLM's examination of the Lost Zarembo prospect revealed a block of banded, iron-stained, silicified greenstone that strikes 270° to 310° and dips 30° to 50° to the north. It is exposed in the northwest wall of a borrow pit (photo 17). The block extends approximately 50 feet along strike and is bounded on the southwest by a fault contact with rhyolite and on the northeast by cover and a basalt dike. Within this block, three conformable bands of massive sulfides, 0.4, 0.8, and 2.6 feet thick, are separated by 1.2 to 3.0 feet of less silicified greenstone. The massive bands extend for approximately 45 feet. To the southwest, they pinch out. They contain pyrite, pyrrhotite, chalcopyrite, galena, sphalerite, and barite.

Samples across the sulfide bands at Lost Zarembo contained from 8.3 to 27.6 ppm silver, 966 to 3,781 ppm copper, 818 to 3,567 ppm lead, 1.9 to 4.6 percent zinc, and from 1.53 to 10.10 percent barium (map no. 67.1, samples 316, 318, 321). Samples across the greenstone between the sulfide bands contained from 331 to 2,038 ppm zinc (map no. 67.1, samples 317, 319). A grab sample of higher-grade sulfides contained 5.5 percent zinc (map no. 67.1, sample 2625). A representative sample across barite- and sphalerite-bearing rubblecrop contained 4.92 percent zinc and 29.3 percent barium (map no. 67.1, sample 9667).

Conclusions

The massive sulfide-barite bands at the Lost Zarembo prospect are too small and dismembered to be significant exploration targets in themselves. Other Triassic rocks in the area, particularly the banded silicified greenstones, could however, attract mineral industry exploration attention.

Photo 17. Excavation in a borrow pit reveals bands of barite and sulfides at the Lost Zarembo prospect. Photo by J. Still.

GALLAVANTIN 1-3

(Plate 1, Map no. 68)

MAS no.:	0021170057	*Quadrangle:*	Petersburg B2
Deposit Type:	Mag Seg: Cu	*Latitude:*	56.4181
Land Status:	Open Federal	*Longitude:*	-132.6279
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate name:	Zarembo Island Hornblendite		

Location/Access

The Gallavantin 1-3 prospect is on the northeast side of the Zarembo Island, north of Deep Bay. It is 10 miles west-southwest of Wrangell. The area topography is of moderate relief and covered with second-growth timber and thick brush. Access is easy by boat, float plane, or helicopter.

History

The Gallavantin 1-3 claims were staked for iron and copper in 1974 (Alaska Kardex, 117-081). Other than the Kardex reference, a literature search revealed no mention of prospects in the area.

Mineral Assessment

The Gallavantin 1-3 claims are in what has been mapped as Cretaceous gabbro (Karl and others, 1999). In places the prospect consists predominantly of coarse- to fine-grained hornblende and could be considered a hornblendite. It has a 0.8-by-0.4-mile outcrop pattern. It is exposed along the beach for 1,900 feet, in a road cut at an elevation of 100 feet, and along an overgrown road to an elevation of 200 feet.

The BLM's examination revealed blebs and disseminations of chalcopyrite along with pyrite and magnetite hosted in hornblendite. Vegetative cover prevented determining the true extent of the chalcopyrite-rich zones. Where exposed on the beach and in the road cut, the hornblendite with visible chalcopyrite extends up to tens of feet.

A sample of the best copper mineralization found on the beach contained 2,760 ppm copper, 10 ppb platinum, and 28 ppb palladium (map no. 68.1, sample 9666). A 0.2-foot grab sample of the best copper mineralization found in the road cut contained 1,172 ppm copper, 10 ppb platinum, and 7 ppb palladium (map no. 68.1, sample 301). A 0.4-foot grab sample collected at an elevation of 200 feet contained 1,291 ppm copper, 6 ppb platinum, and 3 ppb palladium (map no. 68.1, sample 298).

BLM investigators collected three stream sediment samples from drainages in the hornblendite. One was slightly anomalous in platinum at 11 ppb (map no. 68.1, sample 311). The other two did not contain significant metal values (map no. 68.1, samples 313, 9665).

Conclusions

Where exposed, the Gallavantin 1-3 prospect contains anomalous values in copper, platinum, and palladium. However the grades are too low to attract serious exploration interest.

ZAREMBO ISLAND FLUORITE

(Plate 1, Map no. 69)

MAS no.:	0021170053	*Quadrangle:*	Petersburg B3
Deposit Type:	Vein: F, REE?	*Latitude:*	56.2705
Land Status:	Open Federal	*Longitude:*	-132.9312
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Zarembo Island Fluorite occurrence is on the southwest side of Zarembo Island, between Macnamara Point and Point Nesbitt. It is 25 miles southwest of Wrangell. Rocks in the intertidal zone and along the shoreline are well exposed; however, inland, the area is covered with second-growth trees and thick brush. Access is by boat or helicopter.

History

The Zarembo Island Fluorite occurrence was first recognized by Buddington in 1923 (Buddington, 1923). In 1962 the Bureau of Mines examined 10 miles of beach between Macnamara Point and Point Nesbitt and collected petrographic, pan concentrate, stream sediment, and rock chip samples (Van Alstine and Berryhill, 1963). In 1991 the USGS visited the site and studied its geodes for rare-earth elements (Philpots and Evens, 1992).

Mineral Assessment

The Zarembo Island Fluorite occurrence is in an area of Quaternary and Tertiary rhyolite and andesite (Karl and others, 1999). The fluorite mineralization is hosted in rhyolite (Grybeck and others, 1984).

The Bureau of Mines examination of the area in 1962 revealed fluorite as fracture fillings with drusy quartz in vuggy breccia zones and in geodes for 1,200 feet along the shoreline. The fluorite fracture fillings are up to 1 inch thick, widely scattered, and predominately hosted in banded volcanic rocks. The geodes are 0.25 to 12 inches in diameter. A few brecciated shear zones up to 3 feet thick and 100 feet long are filled with cream-colored chalcedony. Samples failed to reveal significant concentrations of fluorite, radioactive elements, or other economic minerals (Van Alstine and Berryhill, 1963).

In 1991 the USGS examined the geodes in the Zarembo Island Fluorite vicinity. Only trace amounts of rare-earth elements were identified (Philpots and Evens, 1992).

The BLM's work at the prospect included checking the geodes and quartz-fluorite veins for minerals of economic interest. A scintillometer survey revealed slightly elevated radiation levels in the geodes. Samples collected from geodes, silicified zones, and fluorite contained up to 291 ppb gold, 1,768 ppm barium, 65 ppm cerium, and 38 ppm lanthanum (map no. 69.3, sample 296; map no. 69.4, samples 19, 21).

Conclusions

The Zarembo Island Fluorite occurrence does not contain significant concentrations of fluorite, radioactive elements, or other minerals of economic interest. The mineralized rock is scattered and low-grade. The occurrence is unlikely to attract mineral exploration.

ZF

(Plate 1, Map no. 70)

MAS no.:	0021170132	*Quadrangle:*	Petersburg B3
Deposit Type:	Unknown	*Latitude:*	57.3300
Land Status:	Open Federal	*Longitude:*	-132.8900
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The ZF prospect was originally covered by a large block of claims on the southern end of Zarembo Island, 21 miles southwest of Wrangell. The site examined by the BLM is located at an elevation of 1,700 feet on the rounded top of a mountain. This area of Zarembo Island has a well-developed, subparallel, northeast-southwest drainage pattern between Meter Bight to the northeast and Stikine Strait to the southwest. The vegetation is mixed muskeg and small timber. Access is via helicopter or by foot from the nearby logging road system.

History

The ZF block of 242 lode claims was staked in 1978 by NERCO Exploration Co. An option on the claim block was granted to Resource Associates of Alaska in 1979 (Bureau of Land Management, MAS) and to Houston Oil and Minerals in 1981 (Bundtzen and others, 1982). The option on the claim block was dropped by NERCO in 1986 (Bureau of Land Management, ALIS).

Mineral Assessment

The ZF prospect lies within a unit of Quaternary and Tertiary rhyolites, rhyodacites, and related siliceous intrusive and extrusive rocks (Brew, 1997e). This unit is part of a belt of Quaternary to Tertiary felsic to intermediate igneous rocks that crops out along the southwestern half of Zarembo Island. The igneous belt is in contact with Paleozoic and Mesozoic metamorphic rocks to the northeast and is bounded by the Clarence Strait Fault to the southwest (Brew, 1997e; Brew and others, 1984).

Rocks in the vicinity of the prospect are mostly rhyolites with a bleached white appearance. They are massive to thinly bedded and commonly sheared, with milky quartz deposited along the shear surfaces. No sulfides were observed in any of the outcrops examined by BLM investigators. One sample collected from the site did not contain significant metal values (map no. 70.1, sample 293).

Conclusion

Significant mineralization was not found at the ZF prospect.

ROUND POINT

(Plate 1, Map no. 71)

MAS no.:	0021170133	*Quadrangle:*	Petersburg B3
Deposit Type:	VMS: Cu, Zn, Ag	*Latitude:*	56.2808
Land Status:	Open Federal	*Longitude:*	-132.7035
Development:	2 DDH, soil grids	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium
Alternate names: Zarembo Island, Wally Gator			

Location/Access

The Round Point occurrence is in the southeastern quarter of Zarembo Island, 18 miles southwest of Wrangell. The main body of the claim block covers the ridge complex west of Round Point and southeast of the major drainage flowing into Meter Bight. The steep flanks of the mountains are well timbered, and the rounded peaks are covered with mixed muskeg and scrub timber. Peaks rise to elevations of 2,457 feet and are incised by steep river valleys that descend to sea level within a few miles. Access to this area is via helicopter.

History

In 1978 Mapco Inc. staked three claim blocks in the Round Point area: the Hazel, with 344 claims; the Erica, with 36 claims; and the Frances, with 6 claims (Bureau of Land Management, ALIS). The commodities listed include molybdenum, fluorine, and uranium, although no information was found describing the discovery locations of the commodities (Bureau of Land Management, MAS).

A brief company report for ATNA Resources, Inc. calls the prospect the Wally Gator. The company report indicates three massive sulfide showings scattered over a distance of 800 feet. A 5-foot stratigraphic section of quartz-sericite schist contained values up to 5.5 percent zinc, 1.3 percent lead, 0.3 oz/t silver, and 5.9 percent barium. At a lower showing, a 3-foot section of siliceous quartz-sericite schist contained values up to 3.4 percent copper, 1.6 percent zinc, 2.0 oz/t silver, and 2.1 percent barium. Two old “Winky” drill holes are located at this showing. At the lowest showing, quartz-chlorite schist sometimes contains chalcopyrite in bands of pyrite and in fracture fillings. Samples collected from the lowest showing contain up to 3.2 percent copper and 2.4 percent zinc. A soil sampling grid over the area indicated anomalous values up to 1,396 ppm zinc and 16,960 ppm barium (DeLancey,1990).

Mineral Assessment

The Round Point prospect lies within a belt of Quaternary to Tertiary intrusive and extrusive igneous rocks. In the southeastern part of the prospect, a unit of Mesozoic greenschist and greenstone crops out (Brew, 1997e) that has been defined as Triassic Hyd Group (Karl and others, 1999).

After observing a prominent iron-stained zone during aerial reconnaissance of the area, BLM personnel traversed along a creek that flows southeast across sec. 36, T. 64 S, R. 81 E. The rocks exposed in the creek are mapped as Upper Mesozoic greenschist and greenstone (Brew, 1997e). Approximately 0.3 miles downstream from a small lake that feeds the creek, between 1,500 and 1,600 feet elevation, investigators found an outcrop of iron-stained schist with sulfides, both in the creek and in sparse outcrops to the east. The sulfides appear to be concentrated along a contact with a basalt sill. BLM personnel found two 1-inch-diameter drill holes at this location. As they continued down the creek to an elevation of 1,120 feet, they found no other mineralized rock.

The schist contains chalcopyrite and sphalerite, both as disseminations and conformable fine-grained, wispy bands. A conformable mineralized band 0.1 to 0.9 feet thick that strikes 007° and dips 15° east is exposed above a waterfall in the creek. It is hosted in the iron-stained schist and is exposed for 15 feet in the creek bed. It is covered to the north and south. Chip samples across this band contained from 17.2 to 55 ppm silver, from 5,588 ppm to 2.1 percent copper, and from 3,827 ppm to 1.1 percent zinc (map no.71.1, samples 354, 356).

Other chip samples collected from the iron-stained schist at locations downstream, upstream, and to the east of the mineralized band contained up to 2,521 ppm copper and 7,000 ppm zinc (map no. 71.1, sample 359, 9686). A select sample of the material contained 1.5 percent zinc (map no. 71.1, sample 9687).

Conclusions

BLM and company investigation of the Round Point area located an occurrence of copper and zinc. Although small, this occurrence encourages additional reconnaissance in the area for bedded massive sulfide deposits.

SHRUBBY ISLAND

(Plate 1, Map no. 72)

MAS no.:	0021170155	*Quadrangle:*	Petersburg A3
Deposit Type:	PR: Zn, Pb	*Latitude:*	56.2385
Land Status:	Open Federal	*Longitude:*	-132.9835
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

Shrubby Island lies between northeastern Prince of Wales Island and southwestern Zarembo Island in Clarence Strait. The occurrence is on the north end of the island and is exposed in a borrow pit from which material was removed to construct logging roads. Shrubby Island is accessible by boat or float plane under favorable weather conditions. The pit is accessible by foot from the shoreline. Alternative access is by helicopter directly to the borrow pit.

History

There are no known documented mineral occurrences on Shrubby Island; however, the area has been prospected for limestone resources. BLM personnel were attracted to the island by USGS stream sediment samples that contained anomalous zinc and lead concentrations (Cathrall and others, 1983; Smith, 1998).

Mineral Assessment

Shrubby Island has been mapped predominantly as Silurian Heceta Limestone in fault and depositional contact with graywacke, slate, and limestone of the Silurian Bay of Pillars Formation (Brew, 1997b). Only Heceta Limestone is found in the vicinity of the occurrence.

USGS investigations of Shrubby Island included stream sediment sampling and revealed elevated zinc and lead concentrations in samples particularly from the north side of the island, but also from the southeast and west sides (Cathrall and others, 1983). Smith's (1998) reanalysis of stream sediment samples confirmed the elevated zinc and lead concentrations and indicated the samples were even more anomalous compared to others collected in the Petersburg quadrangle. USGS pan concentrate samples do not show the same zinc and lead anomalies. This suggests that the minerals with the elevated concentrations do not partition into the heavy fraction of the stream sediments (Cathrall and others, 1983).

BLM personnel investigated logging road cuts and borrow pits on Shrubby Island in an effort to locate the source of the USGS zinc and lead stream sediment anomalies. In a borrow pit on the north side of the island, the BLM found pods of massive sulfide hosted in blocky, dark gray to white limestone. The pods measure up to 2 feet long and 1 foot wide and consist predominantly of fine- to very fine grained pyrite with sphalerite and minor galena. The sulfides also occur in a network of ¼- to ½-inch-wide veinlets cutting the limestone. The veinlets cover an area approximately 10 feet by 10 feet; additional mineralized rock is also located approximately 30 feet away.

BLM investigators collected three samples of the mineralized limestone. A ½-foot sample across a massive sulfide pod returned 8.1 percent zinc and 3,646 ppm lead (map no. 72.1, sample 8807). A sample across 2.1 feet of sulfide veinlets in limestone returned 1.3 percent zinc and 476 ppm lead (map no. 72.1, sample 3936). The highest gold value was 19 ppb gold (map no. 72.1, sample 3936), and the highest silver was 2.6 ppm (map no. 72.1, sample 8807). Most of the BLM samples were geochemically anomalous in mercury, arsenic, and nickel.

Conclusions

The Shrubby Island occurrence is of little economic significance. It is spatially restricted and contains low precious metal values.

The mineralized rock found by BLM investigators may account for the USGS stream sediment anomaly from the north side of Shrubby Island. Given the drainage of the island, however, this mineralized rock probably does not account for the other two USGS anomalies. It is likely that additional, similarly mineralized rock may be found elsewhere on the island. Base on what has been discovered to date, however, this likelihood is unlikely to attract mineral exploration.

WORONKOFSKI ISLAND

Property name	Plate 1, Map no.
Exchange	73
Sunrise	74

EXCHANGE

(Plate 1, Map no. 73)

MAS no.:	0021170017	*Quadrangle:*	Petersburg B2
Deposit Type:	Vein: Au	*Latitude:*	56.4213
Land Status:	Open Federal	*Longitude:*	-132.5330
Development:	Adit, cuts	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Exchange prospect is on the northwest side of Woronkofski Island, near Wedge Point, 7 miles southwest of Wrangell. The topography in the area is gently sloping and covered with second-growth timber and thick brush. The prospect is on the shoreline. Access is by boat or helicopter.

History

The Exchange claims were first staked in 1900. The prospect consists of a 12- to 15-foot-wide quartz vein with moderate gold values, exposed by surface cuts and a 45-foot adit (Wright and Wright, 1908). The claims were active in the mid-1970's (Alaska Kardex, 117-052), but there is little evidence of what transpired on the claims in the intervening years.

Mineral Assessment

The prospect area is mapped as Jurassic to Cretaceous Seymour Canal Formation turbidites (Karl and others, 1999). However, the prospect is underlain by felsic intrusive rocks that likely correlate with a Cretaceous quartz monzodiorite mapped nearby (Karl and others, 1999).

The BLM's examination of the Exchange prospect revealed an irregular quartz vein up to 16 feet thick, intermittently exposed through cover for 250 feet, in the intertidal zone, in a creek bed, and in a 45-foot adit. The vein is hosted in a granite porphyry and contains small amounts of galena. It strikes north-south and dips 30° to the west in the intertidal zone and strikes 310° and dips 20° to the southwest in the adit.

Investigators collected nine samples from the quartz vein. The highest gold value came from a sample across 5 feet of a 16-foot-wide part of the quartz vein in the creek bed. It contained 923 ppb gold, 26.6 ppm silver, and 944 ppm lead (map no. 73.1, sample 206). The next highest gold value came from a sample across 3 feet of a vein of indeterminate size, exposed in the underground workings. It contained 532 ppb gold, 58 ppm silver, and 2,660 ppm lead (map no. 73.1, sample 10). The other seven samples contained from less than 5 to 131 ppb gold. A stream sediment sample from a creek that crosses the quartz vein did not contain significant metal values (map no. 73.1, sample 14).

Conclusions

The gold values found at the Exchange prospect are too low to attract further exploration of this deposit. However, the existence of the relatively large quartz vein with low but anomalous gold values encourages additional exploration in the area.

SUNRISE

(Plate 1, Map no. 74)

MAS no.:	0021170056	*Quadrangle:*	Petersburg B2
Deposit Type:	Placer: Au	*Latitude:*	56.4187
Land Status:	Open Federal	*Longitude:*	-132.5297
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Sunrise placer prospect is on the northwest side of Woronkofski Island, at the mouth of the creek that drains Sunrise Lake. It is 7 miles southwest of Wrangell. The topography in the area is gently sloping and is covered with second-growth timber and thick brush. Access is by boat or helicopter.

History

The Sunrise 1 and 2 placer claims were staked for gold in 1974 (Alaska Kardex, 117-082). A literature search revealed no additional mention of this prospect.

Mineral Assessment

The 2-mile-long creek that drains Sunrise Lake cuts Cretaceous quartz monzodiorite and Jurassic to Cretaceous Seymour Canal Formation slate (Karl and others, 1999). Gravels from the creek consist of slate and diorite fragments.

The BLM's examination of the Sunrise placer claims consisted of collecting a pan concentrate and two stream sediment samples. The samples did not contain detectable gold nor any other significant metal concentrations (map no. 74.1, samples 63-65).

Conclusions

BLM investigators did not find significant mineralized rock at this prospect. It is unlikely that it will attract future mineral exploration interest.

ETOLIN ISLAND

Property Name — Plate 1, Map no.

KEATING RANGE

(Plate 1, Map no. 75)

MAS no.:	0021170136	*Quadrangle:*	Petersburg A2
Deposit Type:	Unknown	*Latitude:*	56.9218
Land Status:	Open Federal	*Longitude:*	-134.1165
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Keating Range claim block was staked along the north part of the Keating Range on the west side of Etolin Island. It is 26 miles south-southwest of Wrangell. The topography is fairly rugged with elevations ranging from 1,500 to over 3,000 feet. The higher elevations are alpine. The claims are most easily reached by helicopter.

History

The 47-claim Byrdie-T block was staked in 1978 by MAPCO, Inc., along the Keating Range. These claims were active until at least 1981 (Alaska Kardex, 117-096).

Mineral Assessment

The Keating Range claim area is in the Cretaceous and Jurassic greenstone of the Seymour Canal Formation (Karl and others, 1999).

The BLM's investigation of the Keating Range area was confined to collecting two samples from narrow, iron-stained zones in volcanic rocks (map nos. 75.1, 75.2, samples 730, 993). The samples did not contain significant metal values.

Conclusions

BLM samples failed to reveal significant mineralization.

MOSMAN INLET
(Plate 1, Map no. 76)

MAS no.:	0021170154	*Quadrangle:*	Petersburg A2
Deposit Type:	Skarn, Zn, Au, Cu	*Latitude:*	56.3927
Land Status:	Open Federal	*Longitude:*	-131.1112
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access
The Mosman Inlet occurrence is on the west side of Mosman Inlet near its head, on the west side of Etolin Island. It is 25 miles south-southwest of Wrangell. Mosman Inlet can be reached by boat, float plane, or helicopter. High tide covers the prospect.

History
Mention of the Mosman Inlet occurrence was made in 1962 by Bureau of Mines mining engineer Tom Pittman in a hand-written note (Pittman, 1962). No other reference to the occurrence is known.

Mineral Assessment
The Mosman Inlet occurrence is located at the contact between Cretaceous and Jurassic greenstone and Mesozoic and Paleozoic metasedimentary and metavolcanic rocks. To the south, Tertiary alkali granite is exposed (Karl and others, 1999).

Pittman (1962) notes that a 3-foot-wide calcite vein with a north strike is exposed on the beach just below the high-tide line for a distance of 10 feet. To the north it runs under a section of beach gravel and ocean. To the south it runs under overburden. The vein has abundant garnets, chalcopyrite, pyrite, and light-colored sphalerite. A sample across the vein contained 9.5 percent zinc, 0.13 percent copper, 0.41 oz/t silver, and a trace of gold and lead (Pittman, 1962).

BLM investigation of the Mosman Inlet occurrence revealed a 0.1- to 0.7-foot-thick by 3-foot-long zone in an overhanging cliff near tidewater. This tactite zone contains, calcite, garnets, magnetite, calcsilicate minerals, chalcopyrite, and malachite stain. Samples across this zone contained up to 1,481 ppb gold, 35.4 ppm silver, 3,635 ppm copper, and 585 ppm zinc. Examination of the area across the head of Mosman Inlet (to the west of the above location and to the south) failed to reveal additional mineralization.

Conclusions
BLM examination failed to reveal the 3-foot-wide zone that contained 9.5 percent zinc discovered by Pittman in 1962. In the 38 years since this zone was originally discovered, it could have been covered with gravel or beach rubble. BLM examination did reveal a tactite zone containing anomalous values in gold, silver, copper, and zinc. There is not sufficient mineralization to attract exploration interest.

STEAMER BAY
(Plate 1, Map no. 77)

MAS no.:	0021170068	*Quadrangle:*	Petersburg A2
Deposit Type:	PV: Zn, Pb, Cu, Ag	*Latitude:*	56.1370
Land Status:	Open Federal	*Longitude:*	-134.6564
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate name:	Plumb 1-22		

Location/Access
The Steamer Bay occurrence is at the head of Steamer Bay on the west side of Etolin Island, just south of the confluence of Stikine Strait and Clarence Strait. It is 26 miles south-southwest of Wrangell. The site encompasses five streams that drain the Keating Range to the northeast. Steamer Bay can be reached by boat, float plane, or helicopter. The inland creeks are accessible by foot only. A Forest Service cabin is located at the mouth of Steamer Bay on the northeastern shore.

History
The Steamer Bay occurrence was staked for lead by Paul Pieper in 1972 and held through 1973. It consisted of the Plumb 1-22 claims and the Plumb "fractions" 23-26. The only recorded activity took place on the Plumb 1-5; however, the type of activity was not described (Alaska Kardex, 117-078).

Mineral Assessment
The occurrence lies along the margins of the Steamer Bay Fault, which cuts the Jurassic to Cretaceous Brothers Volcanics/Douglas Island Volcanics. Steamer Bay and Porcupine Creek are the surface expressions of this northwest- to southeast-trending fault. The rocks associated with this unit are andesite to basalt flows, volcanic breccias, volcanic graywacke, tuff, phyllite, and slate (Brew, 1997a; 1997b). BLM personnel traversed a short distance up the two streams and collected two float samples (map no. 77.1, samples 467, 8719). The best sample, 467, from a piece of silicified breccia, contained 10.9 ppm silver, 1,407 ppm copper, 1.01 percent lead, and 1.9 percent zinc.

Conclusions
The relatively low metal values suggest the occurrence is unlikely to attract exploration interest.

WRANGELL ISLAND AND VICININTY

Property name Plate 1, Map no.

OBSIDIAN

(Plate 1, Map no. 78)

MAS no.:	0021170060	*Quadrangle:*	Petersburg B2
Deposit Type:	Unknown: Au?, W?	*Latitude:*	56.5213
Land Status:	Open Federal	*Longitude:*	-132.9954
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The reported location of the Obsidian prospect is near tide water, 1,000 feet north of Pat Creek. It is 9 miles south of Wrangell. The topography in the area is moderately steep with second-growth timber and brush cover. Access to the prospect is by vehicle.

History

A Territory of Alaska report (Roehm, 1940) mentions the discovery of the Obsidian claims occurred in 1934. The claims' owner describes a contact between granite and slate and reports gold assays up to $150 per ton from seams in the slate. The owner also describes another granite-slate contact located half a mile up Pat Creek, where a local doctor conducted analysis of samples that resulted in assertions of the presence of niobium, radium, platinum, gold, and silver. However, the doctor's surgical instruments and the clothes she was wearing were consumed in the analysis process, which included boiling in acid. The samples were then sent out for analysis, at which time the above elements were discovered and gold/silver analysis of $2 per/ton was reported. The claim owner reported that he had no faith in the findings and that no work has been done on the property since 1937 (Roehm, 1940). According to Alaska Kardex (117-073), three claims at the same location bear the name Obsidian and were staked for tungsten in 1967.

Mineral Assessment

The Obsidian claims are at the contact between Cretaceous and Jurassic Seymour Canal Formation graywacke and Cretaceous Tonalite (Karl and others, 1999).

The granite-slate contact described in Roehm's report was located by BLM personnel 1,000 feet north of Pat Creek. The contact zone is approximately 5 feet thick and consisted of slate hornfels with sparse quartz stringers. A sample across a 0.3-foot-wide stringer and another across the contact each contained less than 5 ppb gold. The samples contained 206 to 784 ppm zinc (map no. 78.1, samples 596, 8893). A reconnaissance stream sediment and a float sample from the mouth of Pat Creek failed to contain anomalous metal values (map nos. R279, R280, samples 94, 260).

Conclusions

BLM examination and sampling of the Obsidian claim area did not substantiate earlier claims of high gold values or claims of niobium, radium, platinum, and silver. The circumstances of the earlier analysis are questionable. Despite the fact that the claims were staked in1967 for tungsten, no anomalous tungsten values were detected in BLM samples.

SALAMANDER CREEK PIT

(Plate 1, Map no. 79)

MAS no.:	0021170159	*Quadrangle:*	Petersburg B2
Deposit Type:	Skarn: Cu	*Latitude:*	56.3063
Land Status:	Open Federal	*Longitude:*	-132.2250
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Salamander Creek borrow pit is near the Salamander Creek picnic area, which is 7½ miles from the beginning of Forest Service Road 6265 on Wrangell Island. It is 14 miles south-southeast of Wrangell. The topography in the area is moderately steep with second-growth timber and brush cover. Access is by vehicle.

History

The Salamander Creek borrow pit is spectacularly iron-stained with orange, red, and yellow. It was reported by a helicopter pilot as well as by USGS geologist Dave Brew. Brew was the first to map this pit in detail, and he reported its potential importance to the BLM via electronic mail in 1998.

Mineral Assessment

The Salamander Creek borrow pit is in Upper Cretaceous, metamorphosed, Stephens Passage Group rocks near their contact with Upper Cretaceous biotite granodiorite (Brew, 1997c).

The BLM's examination revealed a contact zone between biotite granodiorite, and schist and slate. The contact zone is irregular, locally brecciated, silicified, and contains disseminations and blebs of pyrite and pyrrhotite in biotite and muscovite schist. Locally, the zone contains green and red garnets. Investigators collected seven samples from various parts of the contact zone. The two highest-grade samples contained 227 ppm copper and 17 ppm molybdenum (map no. 79.1, samples 76, 78).

Conclusions

Limited BLM sampling indicates that the Salamander Creek borrow pit does not contain significant metal values. However, the contact zone is sufficiently interesting to encourage examination of the area for additional occurrences.

BRUISER

(Plate 1, Map no. 80)

MAS no.:	001170065	*Quadrangle:*	Petersburg A1
Deposit Type:	Vein: Au?, W?	*Latitude:*	56.1059
Land Status:	Open Federal	*Longitude:*	-132.0774
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Bruiser property is on the west side of Found Island, which is off the southern tip of Wrangell Island. It is 28 miles south-southeast of Wrangell. The rocks of interest lie in the short cliffs along the high-tide line and are best seen at medium to low tide. Inland, the vegetation is very dense. The island can be conveniently reached by boat from Wrangell. Alternatively, access is possible by float plane and helicopter at low tide.

History

The Bruiser No. 1 claim was first staked on Found Island by Clint Payne in 1961. Besides the fact that the claim was staked for gold, information regarding the property is vague. It appears as though the claim was active through 1967 and again between 1970 and 1977 (Alaska Kardex, 117-065).

Mineral Assessment

Found Island has been mapped as Jurassic to Cretaceous sediments (Gehrels and Berg, 1992). Along the west-central shoreline, a network of concordant quartz veins is hosted in black sandy slates and staurolite schist. The veins vary in width from stringers to 3.0 feet, strike 020°, and dip 31° to the southeast. The quartz veins appear to be nearly barren, with only minor amounts of pyrrhotite present.

BLM personnel conducted a brief reconnaissance along the western shoreline of Found Island. The quartz veins described above were the only rocks observed with any associated sulfides. Samples of the quartz veins did not contain significant metal values.

Conclusion

The Bruiser property consists of a network of barren quartz veins with no apparent mineral value.

NIBLACK ISLAND

(Plate 1, Map no. 81)

MAS no.:	0021170066	*Quadrangle:*	Petersburg A1
Deposit Type:	Porphry?: Cu	*Latitude:*	56.6496
Land Status:	Open Federal	*Longitude:*	-133.0249
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Niblack Island occurrence is 31 miles south-southeast of Wrangell on a small group of islands in Ernest Sound. The claims associated with the occurrence are on the two largest islands. Access to the islands is best by boat, although float plane access is possible in fair weather, and helicopter access is possible at low and medium tide.

History

In 1956 as many as ten claims were staked by six different people at various locations on the Niblack Islands. All the claims were staked for copper; however, there is no information of exploration work (Alaska Kardex, 117-003).

Mineral Assessment

The rocks on the Niblack Islands are mapped as Tertiary granites (Gehrels and Berg, 1992). In at least one area, these granites were observed to contain small amounts of chalcopyrite.

BLM personnel made three traverses in the Niblack Island area while investigating the occurrence: the first, around the northern tip of the large central island; the second, around the northern tip of the small island to the north of the long Niblack Island; and the third, around the northern tip of the long island. A sample of granite, collected from the north side of the small island on the second traverse, contained 1,725 ppm copper (map no. 81.1, sample 8716).

Conclusions

The BLM's investigation did not reveal significant sulfide mineralization.

MAINLAND

Property	Plate 1, Map no.
Lake	109
Berg Basin	110
Copper King	111
Berg	112
Cone Mountain	113
Black Crag	114
Craig River area	115
Craig Claims area	116
North Bradfield River Skarn	117
Mt Lewis Cass	118
Upper Marten Lake	119
Bradfield Canal Shear	120
Bradfield River	121

K & D MINE

(Fig. 25, Map no. 82)

MAS no.:	0021150006	*Quadrangle:*	Sumdum B5
Deposit Type:	Vein: Au, Ag, Sb	*Latitude:*	56.8058
Land Status:	Open Federal	*Longitude:*	-133.9503
Development:	3 Adits, shaft	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low
Alternate name:	Marie		

Location/Access

The K & D Mine is on the north side of Libby Creek, which is on the mainland east of Stephens Passage, between Hobart Bay and Windham Bay. It is 51 miles north-northwest of Petersburg. The prospect workings are 1½ miles from the shoreline of Stephens Passage and are within 50 feet of the stream embankment (photo 18). The references that describe the location of the K & D as 2½ miles from the beach, shown on the USGS Sumdum B-5 quadrangle map, are in error. The site may be accessed by helicopter or on foot by walking approximately a quarter mile upstream from a logging road bridge that crosses Libby Creek. The logging road is part of the Hobart Bay logging road system. Although the K & D Mine itself is located on Federal land, the lower Libby Creek drainage extending west of the K & D is Native land. The area around the prospect has been logged.

History

The K & D Mine is named after Herman Kloss and Jack Davis, the earliest recorded claimants of the property (U.S. Bureau of Mines, Mine Production Records). The exact date of discovery is unknown. In 1939 the property was listed in Bureau of Mines records as the Marie. The same records show that a 2-ton Gibson mill was on the site and that there was 90 feet of drift. From 1939 to 1940, a total of 42 tons of ore was processed by amalgamation treatment that recovered 15 ounces of gold and 6 ounces of silver. From 1947 to1948, the only other years of recorded production, a total of 16 tons of ore was processed by amalgamation that recovered 10 ounces of gold and 4 ounces of silver (U.S. Bureau of Mines, Mine Production Records). By the summer of 1948, the operation included two very short adits and a 145-foot-long adit with an associated 38-foot inclined shaft (Stewart, 1949). Aside from annual maintenance, no further extension of underground workings was reported after that time (Alaska Kardex, 115-009). The claims were active from 1979 through 1994 when the most recent claimant, Goldbelt, Inc., dropped the claims.

In 1950 the Bureau of Mines collected and analyzed five samples from the K & D Mine (See table 2). Three of the samples had notable gold values: 1.95, 0.71, and 0.50 oz/t gold (Peterson, 1950). Also noteworthy is the presence of native antimony, which is found near the face of the underground workings (Stewart, 1949).

The USGS collected ten samples from the mine in 1969. Gold values ranged from 0.02 to 0.7 ppm (Clark and others, 1970a).

In the early 1980's, Aspen Exploration Corporation and Phillips Petroleum visited and sampled the vein. High-grade samples reportedly ran as high as 5 oz/t gold (WGM, 1992).

In 1991 and 1992 WGM, Inc. mapped and sampled the mine as part of assessment work on claims held by Goldbelt, Inc. in the Hobart Bay area. Samples taken across the width of the vein ran as high as 0.079 oz/t gold, 0.63 oz/t silver, 4,033 ppm lead, and 2,080 ppm zinc (See table 2; WGM, 1991; 1992).

Mineral Assessment

The K & D Mine area is surrounded by metamorphosed, Permian to Cretaceous sedimentary and volcanic rocks (Gehrels and Berg, 1992). The mineralized vein at the prospect is conformable with the structure in the surrounding graphitic, gray schist (Williams, 1951).

The mineralized rock at the K & D consists of a large quartz vein up to 25 feet thick. The vein is exposed by an adit and trenches, as well as in the north bank and the bed of Libby Creek (fig. 25). The creek generally follows the strike of the vein. The vein strikes from 022° to 050° and dips from 20° to 44° to the northwest. The mineralized portion of the vein is exposed along strike for approximately 300 feet, although the vein continues to the northeast along strike for roughly 1,000 feet.

There were probably several periods of shearing during vein formation at the K & D, which allowed for multiple mineralizing episodes and the development of a complex mineral suite. The main quartz vein is locally thick and massive, but much of the vein is highly fractured and ribboned with 1- to 6-inch-thick parallel quartz layers that make up the full width of the vein. The vein contains stibnite, galena, sphalerite, arsenopyrite, jamesonite, native antimony, and gold, which are primarily found in shoots, or in shears or fractures, within wide quartz bands. The strike and dip of the shoots vary somewhat from those of the main vein (Williams, 1951).

In 1998 and 2000 BLM personnel mapped and sampled the surface features and outcrops at the K & D site. At the time of examination, the main adit portal was partly caved and the workings flooded, so the underground features were not examined or sampled.

Six of the BLM's 20 samples from the K & D Mine had gold concentrations above 800 ppb map nos. 82.7-82.9, 82.12, 82.13, samples 770, 3690, 3693, 3694, 8660, 8662). The highest-grade sample contained 0.757 oz/t gold, greater than 50 ppm silver, 1.27 percent arsenic, and anomalously high lead, zinc, and cadmium over 2.3 feet (map no. 82.9, sample 3693). This sample was taken from the northeast side of a small, shallow, inclined shaft located southwest of the main adit. Field observations and chemical analyses indicate that gold in the samples is associated with arsenopyrite. A high-grade sample was also collected from the same location. It contained 7,447 ppb gold, 169 ppm silver, 1.06 percent lead, over 10,000 ppm arsenic, and anomalously high levels of zinc, cadmium, mercury, and antimony (map no. 82.9, sample 3694).

Conclusions

The deposit at the K & D Mine is best described as a simple antimony vein as defined by Cox and Singer (1986). Although the quartz vein at the K & D Mine is relatively large and continuous, elevated precious metal contents are restricted to isolated parts of the vein. The mineralized parts of the vein are generally thin and discontinuous. As it is presently understood, the K & D Mine is unlikely to become a significant precious or base metal resource.

Table 2. Analytical results for samples shown on K & D map (fig. 25).
WGM = WGM, Inc.; USBM = U.S. Bureau of Mines.

Map no.	Sample no.	Source	Sample width in feet	Au ppb (opt)	Ag ppm (opt)	Sb ppm (%)	Cu ppm (%)	Pb ppm (%)	Zn ppm (%)	As ppm (%)
82.4	769	this study	4	105	3.1	<5	6	113	294	452
82.12	770	this study	2.75	1647	25	11	6	548	684	517
82.3	771	this study	5.5	351	5.7	8	16	175	281	124
82.1	772	this study	1	55	1.8	<5	3	35	132	<5
82.13	3690	this study	2.3	994	26.2	6	21	459	1462	523
82.10	3691	this study	1.2	7	0.4	<5	52	12	252	12
82.11	3692	this study	1.3	21	0.7	25	66	9	316	8
82.9	3693	this study	2.3	25960	>50	51	7	2231	2233	>10000
82.10	3694	this study	--	7447	169	>2000	90	(1.6)	7081	>10000
82.13	3695	this study	--	55	0.5	42	9	53	49	70
82.7	8660	this study	0.3	3716	33.9	24	187	463	4683	6323
82.5	8661	this study	4.3	35	1.2	<5	21	30	40	24
82.8	8662	this study	1.6	863	0.8	<5	13	46	114	1376
82.6	8663	this study	1.3	14	0.5	34	69	11	357	26
82.2	8664	this study	0.5	32	2.4	14	95	47	251	10
82.1	8665	this study	0.1	179	6.7	49	33	65	205	50
	21816	WGM	3	(<0.002)	--	--	--	--	--	–
	21817	WGM	4	(0.018)	--	--	--	--	--	–
	21818	WGM	3	(0.077)	--	--	--	--	--	–
	21819	WGM	6	(0.011)	--	--	--	--	--	–
	21820	WGM	2	(0.040)	--	--	--	--	--	–
	21821	WGM	2	(<0.002)	--	--	--	--	--	–
	21822	WGM	5	(0.109)	--	--	--	--	--	–
	21823	WGM	5	(0.004)	--	--	--	--	--	–
	21824	WGM	5	<5	--	161	--	--	--	–
	21828	WGM	5	1163	--	--	--	--	--	–
	1	USBM	5	(<0.005)	(0.1)	(0.1)	(<0.05)	(<0.1)	(0.05)	(0.05)
	2	USBM	5	(1.95)	(1.1)	(0.2)	(<0.05)	(<0.1)	(0.05)	(0.20)
	3	USBM	--	(<0.71)	(0.6)	(0.1)	(<0.05)	(<0.1)	(0.10)	(0.10)
	4	USBM	5.1	(<.06)	(0.9)	(1.5)	(<0.05)	(<0.1)	(0.10)	(0.20)
	5	USBM	5.3	(<.050)	(0.8)	(0.2)	(<0.05)	(<0.1)	(0.05)	(0.30)

Photo 18. A thick quartz vein and remains of workings at the K & D Mine. Current access to the adit is through a makeshift portal under the large fallen tree near the workings. Photo by K. Bean.

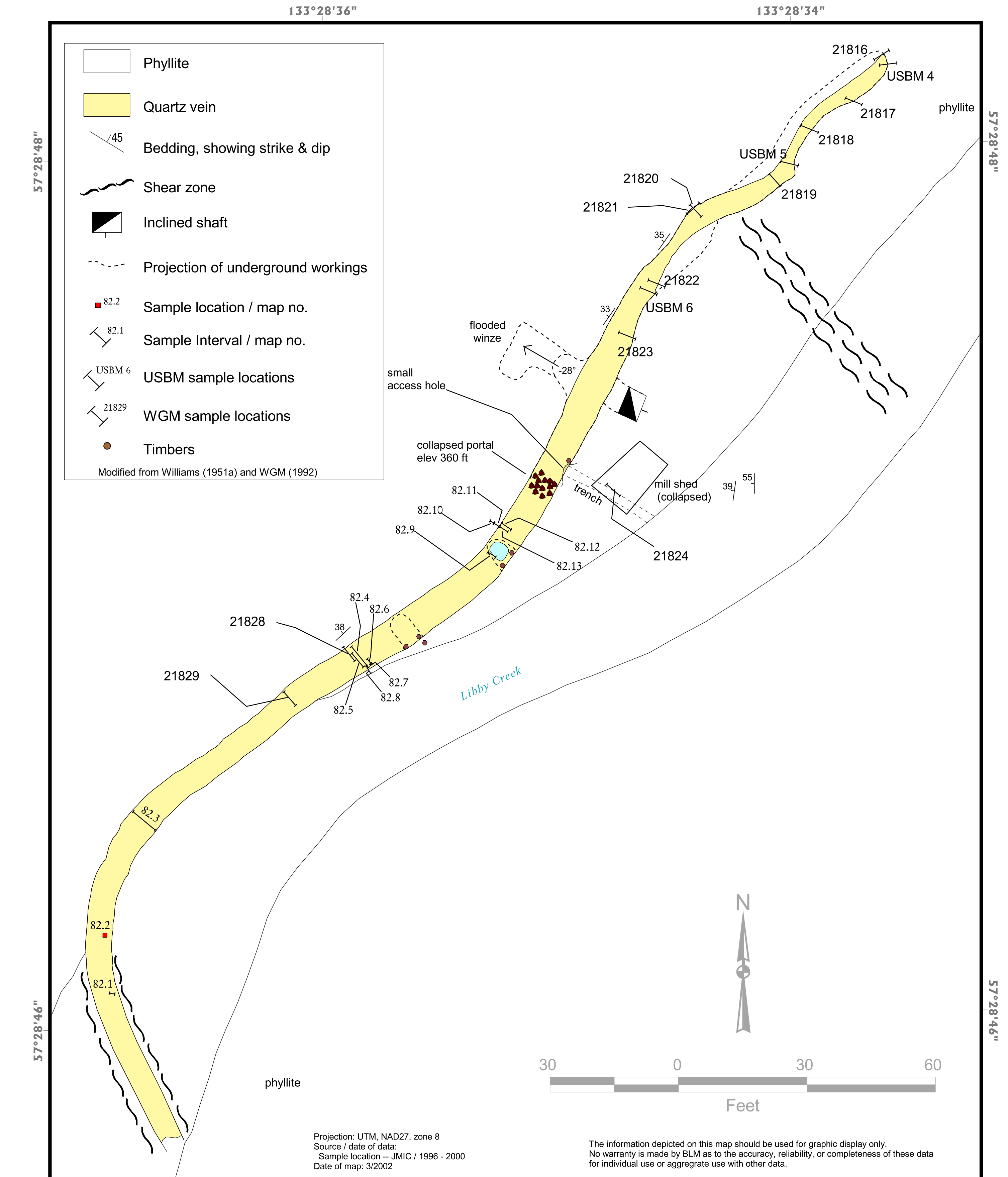

Figure 25. Map of the K & D prospect.

HOBART BAY ROAD SYSTEM

(Plate 2, Map nos. R302-354)

MAS no.:	NA	*Quadrangle:*	Sumdum B4, B5
Deposit Type:	NA	*Latitude:*	57.4
Land Status:	Native, Open Federal	*Longitude:*	-133.4
Development:	Road System	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

Hobart Bay is on the mainland approximately 45 miles north-northwest of Petersburg. Access is by boat or air. A floating dock and log transfer facility were serviceable at the time of this study. The road system is predominately on Native lands owned by Goldbelt, Inc. (the ANCSA, Native village corporation for Juneau) and permission is required for access. Subsurface rights are held by Sealaska Corporation, the regional Native corporation. There are approximately 100 miles of logging roads in the area, although many of the roads are deeply water barred and are not suitable for automobiles.

Mineral Assessment

The Hobart Bay area generally consists of Cretaceous to Permian, foliated phyllites and schists of volcanic and sedimentary origin. These rocks have been intruded by relatively small granodiorite to tonalite dikes and sills of Cretaceous age (Gehrels and Berg, 1992). The intrusive rock is the preferred road building material in the area. The Hobart Bay region lies within the Taku terrane (Jones and others, 1981) and is thought to be an extension of the Juneau goldbelt.

In 1988 the Sealaska Corporation commissioned a reconnaissance geology study on Hobart Bay area Native lands. The study consisted of geologic mapping as well as the collection of 92 stream sediment and 143 rock samples (Hedderly-Smith, 1990). Samples were analyzed for gold, silver, copper, lead, and zinc. Although economic minerals were not found in quantity, individual rock chip samples ran as high as 3,990 ppm zinc and 587 ppm copper and stream sediment samples as high as 670 ppm zinc (Hedderly-Smith, 1990).

The BLM collected 69 rock chip and samples from quarries and outcrops and 5 stream sediment samples from the Hobart Bay area. Though the area is generally unmineralized, select samples contained values as high as 268 ppb gold (map no. R298, sample 2785) and up to 358 ppm copper (map no. R308, sample 2788). One select sample taken from a thin metamorphic quartz vein with coarse sphalerite contained 9,049 ppm zinc (map no. R333, sample 890).

Conclusions

Rock quarries and outcrops along the Hobart Bay road system, although yielding a few anomalous samples, have not indicated the presence of significant mineralization in the region. Observed mineralization appears to be metamorphically segregated in thin pods and lenses, randomly distributed, and discontinuous. However, as noted by Hedderly-Smith (1990), the area is poorly mapped and under-explored and therefore warrants further investigation, especially given that the area is on trend with, and in the same geologic terrane as, rocks in the Juneau goldbelt.

LOUISE GROUP

(Fig. 26, Map no. 83)

MAS no.:	0021150011	*Quadrangle:*	Sumdum B4
Deposit Type:	PR: Cu	*Latitude:*	56.5503
Land Status:	Open Federal	*Longitude:*	-133.0268
Development:	2 Adits	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low
Alternate name:	Port Houghton		

Location/Access

Situated at an elevation of approximately 750 feet, the Louise Group prospect is south of the Salt Chuck at the head of Port Houghton. The large tidal flat at the head of Port Houghton complicates access by boat or plane, but nearby muskegs provide good access for helicopters. The prospect must be reached by foot from the muskegs near tidewater, which requires a hike of about a mile to the east, up relatively steep, heavily forested terrain that is characterized by alternating cliffs and benches.

History

Buddington (1925) provides the earliest published account of workings at Port Houghton. The prospect was old and abandoned at the time of his visit. In 1923 he comments, "the work was done years ago." The remains of two cabins and associated mining equipment suggest that the Louise Group was worked sometime between 1904 and 1920 (Bowers and others, 1995). Details of the workings described by Buddington (1925) very closely match observations made during this study 77 years later indicating that little if any further work post dates his visit, even though the claims have been intermittently active since then (Alaska Kardex, 115-020).

Mineral Assessment

The Louise Group prospect lies within undifferentiated sedimentary and volcanic rocks of Cretaceous to Permian age (Gehrels and Berg, 1992). The prospect itself explores mineralization along a steep, west-dipping, north-south fault contact between a coarse-grained garnet-quartz-biotite gneiss and medium-grained amphibolite (fig. 25).

Although the prospect as described by Buddington (1925) consists of three open cuts and two short adits, time constraints caused the BLM investigators to focus its efforts on mapping and sampling the main adit. The main adit consists of a 116-foot crosscut driven eastward into gneiss, across a fault contact and into the amphibolite footwall (fig. 25). A 132-foot drift branches south from the crosscut and follows mineralized rock, roughly parallel to the fault, along the hanging wall.

Ore minerals appear to be confined to the hanging wall (gneiss) and are generally concentrated in lenses of pyrrhotite and chalcopyrite, with or without pyrite and magnetite. The most mineralized rock is exposed in the back of the drift near the crosscut/drift junction where a small shear, orthogonal to the main fault, cuts across the adit. Lesser amounts of chalcopyrite are disseminated throughout the gneiss. Buddington (1925) reports a single grab sample from an adit with 1.34 percent copper. The highest copper value from this study (map no. 83.3, sample 6412) ran 4,899 ppm. However, samples taken across the entire adit width (map no. 83.4 and 83.1, samples 973, 6411) ran a more representative 1,069 and 1,150 ppm copper. Gold results were barely anomalous, ranging from 8 to 38 ppb. Analytical results revealed no other significant mineralization.

Conclusions

While the Louise Group is a historically interesting and well-preserved example of turn-of-the-century prospecting in Alaska, the BLM's examination of the prospect revealed no mineralization of economic importance.

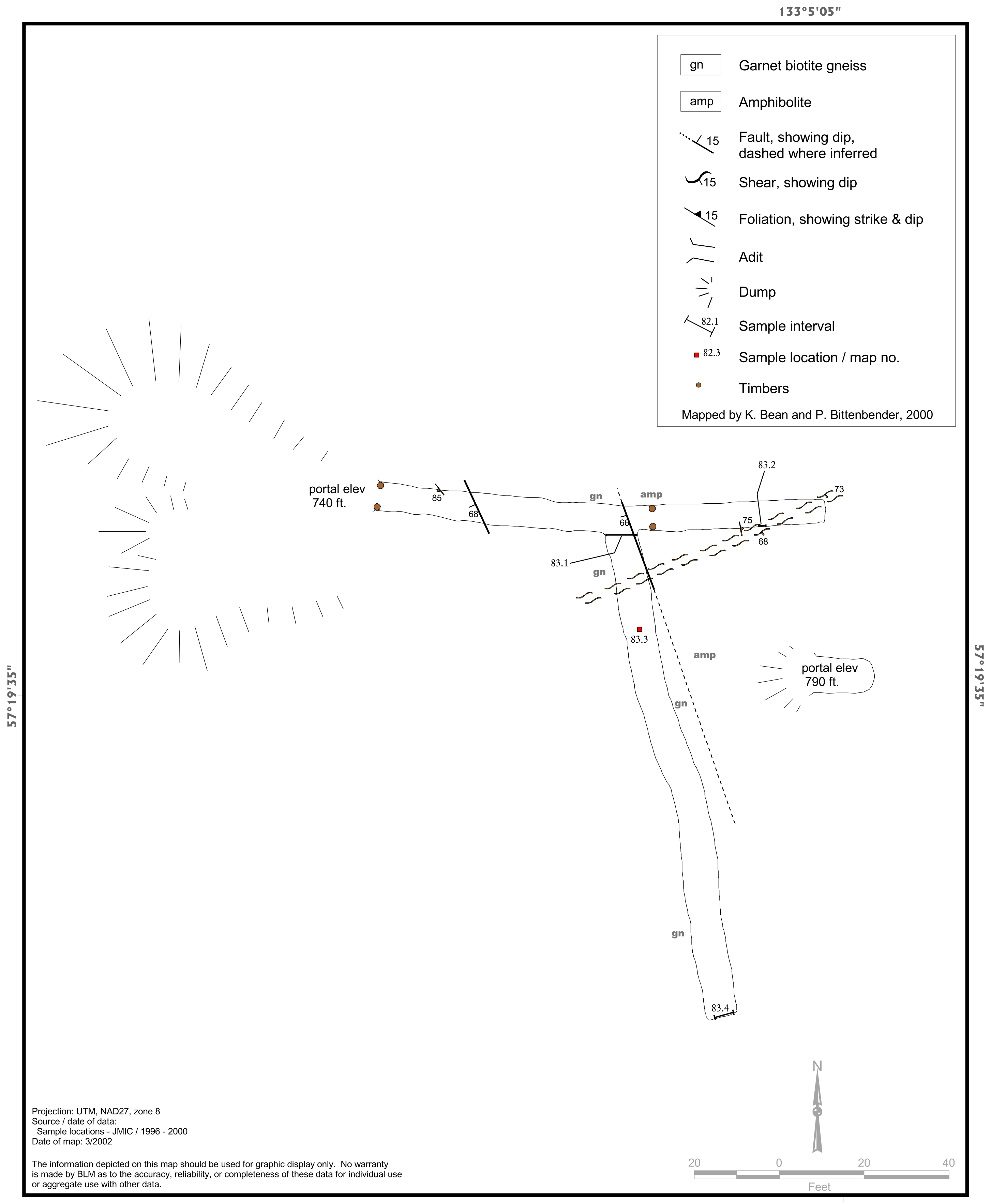

Figure 26. Map of the Louise Group prospect.

SUN 1-2

(Plate 1, Map no. 84)

MAS no.:	0021150016	*Quadrangle:*	Sumdum B3
Deposit Type:	PV: Au, Ag, Pb, Zn	*Latitude:*	57.3316
Land Status:	Open Federal	*Longitude:*	-132.9129
Development:	1 DDH, cut	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Sun 1-2 prospect is on the south side of Glory Lake, east of Port Houghton and 36 miles north of Petersburg. The prospect is near the mouth of the longest drainage that flows into the south side of Glory Lake, near its eastern end. The easiest access to the site is by helicopter or float plane. In the past, access was available by a trail that lead from Farragut Bay, along the Farragut River, across Farragut Lake, and on to Glory Lake. The prospect is at an elevation of 500 feet in steep topography. Vegetation in the area is re-establishing itself following recent deglaciation.

History

Glenn Reid of Petersburg, Alaska, held the Sun claims in 1974 (Alaska Kardex, 115-058). There is no other published record of activity at the site. Except for a single exploratory or blast drill hole, BLM investigators found no evidence of mining activity.

There has been other mineral exploration in the Sun 1-2 prospect area. In 1929 and 1930 a narrow, but rich, silver-bearing galena and sphalerite vein was found and examined. Claims covering the discovery were filed under the name “Admiral Group.” Analysis of samples from the vein at the Admiral Group by Livingston (1930) are very similar to analyses of BLM samples from the Sun 1-2. A map made of the Admiral Group prospect in 1930 by Livingston lacks sufficient detail to determine the location of the vein, but it seems to be in the same general area as the Sun 1-2. The 1930 geologic description of the vein by Livingston (1930), does not exactly match the 1998 BLM examination of the Sun 1-2 prospect, however, so whether the two prospects are the same is still in question.

Mineral Assessment

Detailed geologic maps are not available for the Sun 1-2 prospect area, but a regional map describes a tonalite of Paleocene or Cretaceous age in the vicinity (Gehrels and Berg, 1992). In the immediate area of the prospect, the host rock is a gneiss. The foliation in the gneiss strikes 311° and dips 82° to the northeast.

The Sun 1-2 prospect is located in a cut blasted in a small cliff situated on the west side of a stream. It consists of a band of galena and sphalerite, 0.1 feet wide by 11 feet long, that is conformably hosted in gneiss. The exposure measures 3 feet horizontally and 11 feet vertically.

BLM personnel collected six samples from the Sun 1-2 prospect area. One sample from the sulfide band contained 1,411 ppb gold, 1,245.5 ppm silver, 9.99 percent lead, 7.1 percent zinc, 726.3 ppm cadmium, and 3.54 ppm mercury (map no. 84.1, sample 389). Investigators took a select sample from a chalcopyrite-bearing boulder located near the Sun 1-2 sulfide occurrence. It had an elevated copper content of 1,888 ppm (map no. 84.1, sample 8656). A stream sediment sample, taken from the drainage above the outcrop, lacked significant base or precious metals (map no. 84.1, sample 543).

Conclusions

Although the assay of the vein at the Sun 1-2 occurrence is quite high, the vein is only 0.1 foot wide. As it is now known, the prospect is of little economic significance.

THE ISLANDER

(Plate 1, Map no. 85)

MAS no.:	0021150005	*Quadrangle:*	Sumdum B5
Deposit Type:	Vein: Au, Zn	*Latitude:*	57.2676
Land Status:	Open Federal, State	*Longitude:*	-133.5119
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Islander prospect lies on the east side of Steamboat Bay, 0.3 miles southeast of Foot Island and 6 miles north of Cape Fanshaw. It is 39 miles northwest of Petersburg and is accessible by boat, float plane, or helicopter. The property occupies a small, low-elevation peninsula that extends westerly a few hundred feet into Steamboat Bay from the mainland. At high tide, the peninsula becomes an island, with its highest point no more than 10 feet above sea level. Some grass and a few small trees grow on the highest part of the island.

History

The first record of mineral exploration activity at The Islander prospect is a claim filed by S.A. Wilson in 1952 (Alaska Kardex, 115-007). An examination of the property was also made in 1952 by J.A. Williams of the Alaska Territorial Department of Mines (Williams, 1952).

Additional prospecting has occurred in The Islander area. Mineralized rock, similar to that at The Islander, was reported by H.T. Olson on the northeast side of Foot Island, about half a mile to the northwest of The Islander prospect (Williams, 1952). In 1953 there was also a prospect listed as "Discovery Zinc" in the southeastern corner of Steamboat Bay. The reported location would place it about a quarter of a mile east of The Islander prospect (Alaska Kardex, 115-007).

Mineral Assessment

The country rock at The Islander prospect is a fractured graywacke with dark, bluish gray carbonate stringers cutting through it (Williams, 1952). The carbonate stringers include zones heavily mineralized with sulfides, particularly pyrite and sphalerite. Williams took five samples from the carbonate zones, which measured from 3 to 12 inches in width. The assays of the samples showed from 0.16 to 0.48 oz/t gold and 1.91 to 7.5 percent zinc (Williams, 1952).

The BLM examination of the prospect indicated veins at the site strike from 055° to 095°, with most from 085° to 095°. Dips are as little as 24°, but most are more than 50° to the south. The veins with the highest gold values tend to dip very steeply (greater than 79°) to the south or east. As Williams (1952) noted, the veins tend to be short, discontinuous, and narrow (no greater than 1 to 12 inches in width).

BLM personnel collected five samples of mineralized veins at The Islander prospect. A sample from an 11-foot-long vein on the western side of the island contained 7,352 ppb gold, 2.5

percent zinc, and anomalously high levels of copper, cadmium, and mercury (map no. 85.1, sample 385). A sample from a 19-foot-long vein on the southern side of the island contained 1.077 oz/t gold, 9.7 percent zinc, over 10,000 ppm arsenic, and anomalously high levels of silver, copper, cadmium, and mercury (map no. 85.1, sample 387). Sample 8654 (map no. 85.1) had 0.669 oz/t gold, 8.2 percent zinc, over 10,000 ppm arsenic, and anonymously high levels of silver, copper, cadmium, and mercury. Most of the samples that had high gold values also had anonymously high arsenic, silver, copper, cadmium, and mercury values.

BLM personnel collected several samples from sulfide-bearing graywacke that hosts the mineralized veins. Sample 8653 across 7.5 feet contained 1,645 ppb gold and 1.5 percent zinc; sample 8652 across 0.45 feet contained 7,584 ppb gold and 8.6 percent zinc.

Conclusions

Although the precious metal content of the veins at The Islander prospect is relatively high, there is insufficient tonnage to make them an exploration or development target. Because the veins at the prospect strike generally east-west, the mainland to the east, along the shoreline, was investigated, but similarly mineralized rock was not found. S.A. Wilson, the original claimant, reportedly examined that area also, but to no avail (Williams, 1952).

BAY POINT

(Plate 1, Map no. 86)

MAS no.:	0021150070	*Quadrangle:*	Sumdum A4
Deposit Type:	VMS: Au, Cu, Pb, Zn	*Latitude:*	57.1183
Land Status:	Open Federal	*Longitude:*	-133.2707
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Bay Point prospect is located generally northeast of Bay Point, on the west side of Farragut Bay, 24 miles northwest of Petersburg. Access is possible by boat, float plane, or helicopter at low tide.

History

Hecla Mining Co. (Hecla) discovered mineralized rock in the Bay Point area in May 1990 while following up rock and stream sediment geochemical anomalies identified from a regional USGS reconnaissance sampling program (Clark and others, 1970a). Hecla staked 57 claims in the area in July, 1990 (Jones, 1990). They proceeded with evaluation of the occurrence in 1991, which included geologic mapping, rock chip and stream sediment sampling, and soil grid sampling (Anderson, 1991). Hecla abandoned their claims at Bay Point in 1992 (Bureau of Land Management, ALIS).

Mineral Assessment

The Bay Point prospect sits in rocks that have been mapped as part of the Jurassic to Cretaceous Gravina Belt (Berg and others, 1972; Gehrels and Berg, 1992), which is thought to represent an oceanic arc (Rubin and Saleeby, 1991). The rocks have been metamorphosed to at least greenschist facies and have been multiply deformed (Anderson, 1991; McClelland and others, 1992).

Two unpublished Hecla reports describe the geology and mineralization at the Bay Point prospect (Jones, 1990; Anderson, 1991). They describe a gold-bearing copper massive sulfide occurrence hosted in a "subvolcanic sill" within a sequence of intercalated sediments and volcanics (Anderson, 1991). Mineralized rock consists of disseminations, layers, and pods of sulfides scattered over a 1,000-foot stratigraphic section that extends for 1½ miles. Sulfides include pyrite, pyrrhotite, chalcopyrite, sphalerite, and galena, with local enrichments of gold and minor silver (Jones, 1990; Anderson, 1991). Anderson (1991) describes the sulfide pods as being localized in the noses of folds, which he interprets as a remobilization and concentration of sulfides during deformation.

Analytical results from Hecla's rock chip and soil samples indicate mineralized rock across the Bay Point prospect. Four anomalous areas were identified by soil sampling that represent elevated gold, copper, lead, and zinc concentrations. Soil sample values ran as high as 950 ppb gold, 623 ppm copper, 124 ppm lead, and 178 ppm zinc. Rock chip samples, collected mainly along the shoreline to which most rock outcrop is restricted, returned up to 0.2 oz/t gold, 1.4 oz/t silver, 4.1 percent copper, 2.3 percent lead, and 4.68 percent zinc (Anderson, 1991).

BLM personnel investigated sulfide-bearing rock outcrops along the shoreline at Bay Point. Metavolcanic and metasedimentary rocks host disseminated, layered, and pods of sulfides, similar to those described in the Hecla reports (Jones, 1990; Anderson, 1991). Much of the alteration and mineralization observed by BLM investigators appears to be secondary and clearly crosscuts metamorphic foliation, which was observed to be parallel to lithologic contacts. Only rare layers of sulfide parallel to the foliation suggest primary mineralization. It seems apparent that any primary sulfide deposition has subsequently been remobilized, as suggested by Anderson (1991).

BLM personnel collected 10 samples to evaluate the Bay Point occurrence. Measured samples were collected across sulfide pods and layers, and rock mineralized with disseminated sulfides. Analytical results indicate a significant concentration of gold in some samples along with minor concentrations of base metals, particularly copper. The highest gold value was 2,942 ppb gold across 1.95 feet at the thickest part of a band of massive pyrite (map no. 86.3, sample 8938). This sample also had the highest copper value at 3,752 ppm copper. The highest lead and zinc values were 126 ppm lead and 590 ppm zinc from a band of sulfides, predominantly pyrite, that were concentrated in a silicified shear (map no. 86.3, sample 8937).

Conclusions

The mineralized rock at Bay Point is part of the Gravina Belt that extends the length of Southeast Alaska (Berg and others, 1972). VMS occurrences are found within the Gravina Belt on Douglas Island to the north (e.g., Alaska Treasure; Newberry and others, 1997) as well as on Gravina Island to the south (e.g., Heckman; Maas and others, 1995). Neither of these areas hosts significant concentrations of base metals, but each seems to contain remarkable concentrations of gold, similar to the Bay Point occurrence. Because of the elevated gold, the Bay Point VMS occurrence may be of further exploration interest.

COLP AND LEE

(Plate 1, Map no. 87)

MAS no.:	0021150020	*Quadrangle*	Sumdum A3
Deposit Type:	Unknown: Au?	*Latitude*	57.1042
Land Status:	Open Federal	*Longitude:*	-132.8022
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate names:	Baird Glacier prospect, Hope claims		

Location/Access

The Colp and Lee prospect is 21 miles northeast of Petersburg, near the north end of Thomas Bay. Access is by boat, helicopter, or float plane.

History

The first published record of exploration activity at the site that came to be called the Colp and Lee claims was in 1921 (Buddington, 1923). The location has also been referred to as the Baird Glacier Prospect and the Hope claims. In 1979 Patrick and Janet Whelan staked a series of 38 claims with the name of Colp and Lee (Alaska Kardex, 115-048). In 1989 Patrick Whelan staked 18 claims as an agent for Whelan's Mining and Exploration, Inc., and again used the claim name of Colp and Lee (Petersburg Clerk & Recorder's Office, Book 33, Page 525). In 1996 Forest Service personnel examined part of a claim within the southeast ¼ of section 14, T. 55 S., R. 79 E., but saw no evidence that work had been done on the claim (USDA Forest Service, 1996).

Mineral Assessment

The BLM visited the site in 1999 and collected 3 stream sediment samples (map no. 87.1, samples 567, 568, 2872). None of the samples had anomalous metal values.

Conclusions

This study failed to find signs of mineral exploration activity in the area examined. The area searched may not have been the original mineral occurrence, or perhaps the activity was obscured by plant overgrowth. Stream sediment samples failed to indicate anomalous metal values.

CASCADE MINE

(Plate 1, Map no. 88)

MAS no.:	0021170010	*Quadrangle:*	Petersburg D3
Deposit Type:	Vein: Au	*Latitude:*	56.9918
Land Status:	Open Federal	*Longitude:*	-132.7890
Development:	2 Adits, 1 trench	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Cascade Mine is on the east side of Thomas Bay, a quarter of a mile southeast of Spray Island and half a mile south of the mouth of Cascade Creek. The property is 14 miles northeast of Petersburg and is accessible by boat, float plane, or helicopter. There is a trench located adjacent to the shoreline just above high-tide level. There are also two adits less than 200 feet inland at elevations of 20 and 36 feet. The topography within half a mile of the beach is moderately steep and is covered by vegetation of thick brush and timber.

History

The original discovery date of the Cascade Mine is not known, but records show that the property was held by Colp and Lee of Petersburg in 1920 and for a few years thereafter (Wright, 1945). Sometime before 1921, a vein, reportedly carrying pyrite, arsenopyrite, and minor chalcopyrite, pyrrhotite, and argentiferous galena, was explored by a short tunnel (Berg and Cobb, 1967). The property was restaked by Harry D. Colp, F.R. Porter, and Fred H. McGill in 1944 (Wright, 1945). In 1948 the production of 4 tons of ore yielding 6 ounces of gold and 1 ounce of silver was reported by Don Thomas to the Bureau of Mines (U.S. Bureau of Mines, Mine Production Records). Bureau of Mines personnel sampled the site in 1944 and mapped and sampled the site in 1989 (Maas and Redman, 1989).

Mineral Assessment

The rock units in the Cascade Mine area are mapped as Cretaceous to Tertiary, metamorphosed, bedded, and intrusive rocks. Units include biotite schist, biotite gneiss and gneissic biotite granodiorite, and quartz monzodiorite (Brew and others, 1984). Buddington (1923) describes the rocks hosting the gold-bearing veins at the prospect as hornblende and quartz-mica schists.

BLM personnel observed the rocks hosting the mineralization at the Cascade Mine are predominantly felsic schists. They include garnet-biotite-chlorite schist, quartz-biotite schist, and more silicified schist. The fault zones that concentrate the mineralization are more strongly silicified than the surrounding host rocks and include numerous quartz stringers. Sulfides in the silicified fault zones include pyrite, arsenopyrite, and galena. In places the silicified schist also contains bands of fine-grained sulfides, mainly pyrite, that are parallel to the foliation in the schist as well as in crosscutting stringers.

The Bureau of Mines made its first examination of the Cascade Mine in 1944 and took two samples for analysis.

Bureau of Mines personnel mapped and sampled the site again in 1989. The mapped underground workings consist of a lower adit, 20 feet above sea level. This lower adit is 71 feet long with an 8-foot cross cut. The upper adit, at an elevation of 36 feet, is 21 feet long. During the 1989 examination, investigators observed that the mineralized rock is associated with two fault zones that strike 280° and dip 65° to the northeast. An isolated, high-grade sample from a 4-inch-wide quartz vein within an opencut in front of the lower adit portal yielded 6,975 ppb gold. The average of the other 7 samples collected by the Bureau of Mines in 1989 is 371 ppb gold (Maas and Redman, 1989).

In 1998 BLM investigators collected eight samples from surface and underground workings at the Cascade Mine. The mineralized zones are from 3.5 to 6.5 feet in width. The highest grade sample contained 589 ppb gold over 3.5 feet (map no. 88.1, sample 2801). It was collected from a shear zone in the lower adit. The average of the 8 samples collected is only 137 ppb gold. The samples show a correlation between elevated gold and elevated arsenic values.

Conclusions

The BLM's examination of the Cascade Mine reaffirmed the conclusions of earlier investigators that there are insufficient grades at the property to consider development. The relatively high-grade sample collected by the Bureau of Mines in 1989 was isolated and from a narrow, 4-inch-wide vein. To date, similar mineralization is unknown in the Cascade area, so the potential for discovery of an economically significant deposit is considered to be low.

DAVE'S DREAM

(Plate 1, Map no. 89)

MAS no.:	0021170192	*Quadrangle:*	Petersburg D2
Deposit Type:	Placer: Au	*Latitude:*	56.5485
Land Status:	Closed Federal	*Longitude:*	-132.9587
Development:	None	*MDP:*	Low
BLM work:	Sampled	MEP:	Low

Location/Access

Dave's Dream placer prospect is 19 miles east of Petersburg, Alaska. It is three quarters of a mile north of Le Conte Bay along an unnamed stream between 600 and 700 feet in elevation. The prospect area is a relatively flat stream flood plain approximately 1/3 mile long by 150 yards wide covered by thick brush. Access is by boat or float plane to the mouth of the stream, then by foot to the location. Helicopter access is restricted because the site is within the Stikine-Leconte Wilderness area.

History

A claim location notice discovered by the BLM during its investigation of the Dave's Dream area listed Dave Ohmer as the claimant of the "Dave's Dream" claims. Bill Harlow is the latest claimant of record for the Dave's Dream claim group. There were four claims in the group. The BLM declared the claims invalid in 1996, and no exploration has taken place since then (John Kato, oral commun., 2001).

Mineral Assessment

BLM personnel examined the prospect in July 1999 and found three exploration/sample pits. The largest is 9 feet in diameter and 6 feet deep. It is located northeast of the other two pits. The BLM collected a pan concentrate (map no 89.1, sample 563) and a stream sediment sample (map no 89.1, sample 564) from the pit. The other two pits, which are within 20 feet of each other, were also sampled, yeilding a stream sediment sample (map no 89.1, sample 561) and a pan concentrate sample 562 (map no 89.1). In addition to these 4 samples from the pits, 13 other stream sediment and pan concentrate samples were collected along the stream channel down-gradient, up-gradient, and near the pits. None of the stream sediment samples had anomalous gold values, even sample 564 (map no 89.1), which came from the deepest pit. The highest gold analysis by far was from a pan concentrate sample that had a gold analysis of 753 ppb (map no. 89.1, sample 562).

Conclusions

Because Dave's Dream placer prospect is within the Stikine-LeConte Wilderness, further exploration is not permitted and none seems warranted. The highest grade sample collected by the BLM, 753 ppb gold, is not high enough to be economic, even if the location were easily accessible

MARY MOOSE

(Plate 1, Map no. 90)

MAS no.:	0021170030	*Quadrangle:*	Petersburg C1
Deposit Type:	Placer: Au	*Latitude:*	56.7059
Land Status:	Closed Federal	*Longitude:*	-132.0639
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Mary Moose placer prospect is 14 miles north-northeast of Wrangell. It is located near the mouth of Andrew Creek, about half a mile upstream of its confluence with the Stikine River. The area is a relatively flat river flood plain covered with thick brush. It is only about 20 feet above sea level. Access is by boat or float plane. Helicopter access is restricted because the site is within the Stikine-Leconte Wilderness area.

History

Little is known about the Mary Moose prospect. A Mine Safety and Health Administration (MSHA) file is the only reference. On August 30, 1979, the prospect was classified by MSHA as permanently abandoned, and all information regarding it was removed from their files (W.W. Wilson, written commun., 1999). There has been no known production from the prospect and there is no obvious physical evidence of previous mining activity in the prospect area.

Mineral Assessment

The BLM carried out an aerial reconnaissance of the Mary Moose placer looking for any evidence of past mining activity. Nothing was detected. Investigators collected four stream sediment samples from the area that was reported to be the prospect site (map 90.1, samples 84-85, 247-248). None of the samples contained significant metal values. The highest gold value was 29 ppb (map no. 90.1, sample 248).

Conclusions

Because the Mary Moose placer prospect is within the Stikine-LeConte Wilderness, further exploration is not permitted and none seems warranted.

BUCK BAR

(Plate 1, Map no. 91)

MAS no.:	0021170033	*Quadrangle:*	Petersburg C1
Deposit Type:	Placer: Au	*Latitude:*	56.7383
Land Status:	Closed Federal	*Longitude:*	-132.0471
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Buck Bar prospect is 20 miles northeast of Wrangell, on the north side of the Stikine River. References do not give an exact location, but descriptions suggest it is between Shakes Slough and the mouth of the Ketili River. In that area, the northern side of the Stikine River is flat and brushy for about a mile north of the river. Access to the area is by boat or float plane. Helicopter access is restricted because the site is within the Stikine-Leconte Wilderness area. The wilderness status also precludes mineral entry and development.

History

In 1863 W.P. Blake observed that the Buck Bar area contained fine gold in "coarse river drift" and that some miners had staked claims in the vicinity. The Buck Bar occurrence was supposed to have been discovered in 1861 and to have been the first gold to be profitably mined in Alaska (Brooks, 1923). It is not known how much gold may have been recovered. Apparently, after 1923 there are no additional references to the Buck Bar prospect in published literature.

Mineral Assessment

Brooks (1923) specifically refers to the Buck Bar prospect on the lower Stikine River in his description of bar deposits. He goes on to describe bar deposits as a special type of fluviatile placer deposit in which gold is deposited on stream bottoms as a result of eddy currents. These deposits, usually of small volume, consist of very fine gold (Brooks, 1923). Although typically low-grade, some flood deposits can be profitably worked for a short time every year following the annual river flood.

The BLM examined the Buck Bar deposit at a time when the Stikine River was in full flood. The BLM collected 12 samples at the Buck Bar prospect, 10 of which were within the flood plain of the Stikine River (map nos. 91.1-91.4, samples 86-89, 249-253, and 2856-58). Three samples were pan concentrates and nine were stream sediment samples. None of the 12 samples had significant gold contents. The highest gold value was 80 ppb (map no. 91.3, sample 251).

Conclusions

The BLM's examination of the Buck Bar area failed to reveal even modest amounts of gold in the river deposits. The water level was probably too high to expose the bar deposits. It is also possible that the river's flow patterns have changed over the years and that the bar deposits exploited in 1861 are occurring elsewhere in the river. If the historic Buck Bar occurrence was truly a bar deposit as described by Brooks (1923), its potential for hosting a sizeable deposit is small. The wilderness land status around the Buck Bar prospect also limits the potential for development of occurrences in the area. Recreational gold panning would seem to be the primary use for this resource.

ANDREW CREEK

(Plate 1, Map no. 92)

MAS no.:	0021170161	*Quadrangle:*	Petersburg C1
Deposit Type:	Vein?: Au	*Latitude:*	56.5694
Land Status:	Closed Federal	*Longitude:*	-132.1051
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

Andrew Creek flows into the Stikine River from the south, 14 miles north-northeast of Wrangell. The Andrew Creek occurrence is near the head of the South Fork of Andrew Creek, approximately 8 miles from its mouth and 12.5 miles northeast of Wrangell. The broad, U-shaped valley of the South Fork of Andrew Creek is typical of many Southeast Alaska valleys; the floor is gently sloping along its length, but steepens at its sides where the surrounding ridges rise to 3,000 to 4,000 feet. The valley floor is covered with alder brush, stunted conifers, and muskeg grasses. The occurrence is within the Stikine-LeConte Wilderness, which precludes mineral entry and development. It is accessible by helicopter, although helicopter access is restricted due to the wilderness status. An alternate means of access would be an arduous hike from the mouth of Andrew Creek on the Stikine River.

History

BLM personnel discovered visible gold in a piece of quartz float on the South Fork of Andrew Creek in 1997. They did a follow-up investigation in the area in 1998. The Mary Moose placer claims (map no. 90) were staked at the mouth of Andrew Creek sometime prior to 1979. However, there is no mention of a lode occurrence farther up the drainage.

Mineral Assessment

The Coast Range megalineament of Brew and Ford (1978) runs along the South Fork of Andrew Creek (Brew, 1997H). The area is marked by Cretaceous intrusions southwest of the megalineament and Tertiary intrusions to the northeast. Hosting the intrusions are schists and gneisses, which have commonly been migmatized by the intrusions. Metamorphic grade increases to the northeast and reaches amphibolite to upper amphibolite facies in the South Fork area (Brew, 1997H).

The South Fork of Andrew Creek is along strike with the mineralized rocks of Groundhog Basin to the southeast. However, gold in quartz veins is not known in the Groundhog Basin area.

A general reconnaissance examination of the South Fork of Andrew Creek area in 1997 led to the discovery of a small amount of visible gold in quartz from stream float on the southeast side of the creek (0.822 oz/t gold; map no. 92.3, sample 146). BLM investigators collected 21 stream sediment samples and 1 pan concentrate sample in 1998 in an attempt to locate the source of the gold. The stream sediment samples contained up to 493 ppb gold (map no. 92.3, sample 363) and the pan concentrate sample had 1,058 ppb gold (map no. 92.1, sample 2859). The sample results did not indicate a source for the gold. In addition to the stream samples, investigators examined drainages above the visible gold sample site. They did not discover any more visible gold nor any obvious prospective outcrops. However, they did sample additional quartz float. One sample contained 1,992 ppb gold (map no. 92.3, sample 2850). Other float samples contained from 137 to 693 ppb gold (map no. 92.3, samples 2849-51, 3750, 3800, 9688-90).

Conclusions

The potential exists for a lode gold resource in the upper Andrew Creek valley. Not only was visible gold found in a piece of quartz float, but historic placer claims were located near the mouth of the creek. So far, BLM samples have indicated elevated gold values only in a restricted area on the floor of the Andrew Creek valley. This area is within the Stikine-LeConte Wilderness. Additional work in the area might include examination of the margins of the valley, above the area where elevated gold samples were collected–outside the wilderness.

GROUNDHOG BASIN AREA INTRODUCTION/HISTORY

(Plate 3)

The Groundhog Basin area is approximately 13 miles east of Wrangell (fig. 1). The area measures approximately 2 miles by 4.75 miles and is part of the Groundhog-Berg Basin KMDA (pl. 1). The area includes 12 prospects (pl. 3, map nos.93-107, photos 19-20). Between 1965 and 1981 the area was covered by over 290 claims and optioned in succession by several mineral exploration companies. It is this large claim block that generally defines the broader Groundhog Basin area. This introduction is included to clarify the unique history of the area.

Mineral exploration started in the Groundhog Basin area with the discovery of the Glacier Basin prospect in 1898 (Roppel, 1987). The most significant early prospect was the Groundhog Basin deposit, which was discovered in 1904 (Buddington, 1921).

In 1943 the USGS mapped both the Groundhog Basin deposit and the Glacier Basin prospect and some of the area between the two. Resources were crudely estimated for both the Groundhog Basin deposit and the Glacier Basin prospect (Gault and others, 1953). The Bureau of Mines examined the Groundhog Basin deposit in 1943 and estimated 120,000 indicated tons and 350,000 inferred tons. Both of these estimates were based on average grades of 8.3 percent zinc, 2.5 percent lead, and 2.0 oz/t silver with an average width of 4 feet (Muir, 1943). In 1963 the Bureau of Mines examined the Glacier Basin area again and discovered trace amounts of tin associated with granulite and beryllium associated with quartz-fluorite breccia veins (Berryhill, 1964).

During the late 1950's, Moneta Porcupine Co. staked claims and explored in the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). These included the North Silver and the Huff prospects discovered by William Huff in 1963. That same year W.A. Race mapped and sampled the Huff prospect for the Alaska Territorial Department of Mines (Race, 1963).

In 1965 the Bunker Hill Mining Co. optioned the Groundhog Basin area. The area optioned included 294 claims, known as the Whistlepig claims that cover areas to the north and east of the Groundhog Basin deposit and the area south to the Glacier Basin prospect. Bunker Hill concentrated its efforts on evaluating the Groundhog Basin deposit–tracing it to the north and south–and evaluating the North Silver North prospect. The evaluation of the Groundhog Basin deposit and its north and south extensions included the drilling of 24 drill holes with lengths of 25 to 350 feet. The evaluation of the North Silver North prospect entailed the drilling of seven drill holes with lengths of 85 to 224 feet. Bunker Hill dropped its option at the end of the 1965 field season (Bunker Hill Company, 1965a, 1965b).

Between 1968 and 1970, Humble Oil and Refining Co. optioned the Groundhog Basin area. The company did reconnaissance mapping in 1969 and drilled two holes through the Nelson Glacier respectively. The company dropped its option at the end of the 1970 field season (Humble Oil and Refining Company, 1970a; 1970b).

From 1971 to 1973, the Groundhog Basin area was again optioned, this time to El Paso Natural Gas Co. (El Paso).   It concentrated its efforts on the Copper Zone, North Marsha Peak, East Marsha Peak, and the Huff: collaring 15 drill holes, conducting geophysical surveys, blasting numerous trenches, and collecting thousands of rock chip samples. The company's efforts at the Copper Zone included conducting a geophysical survey (resistivity), drilling 9 holes that ranged in length from 58 to 442 feet, and collecting 1,044 rock chip samples. At the North Marsha Peak prospect the company drilled 3 holes with lengths ranging from 116 to 230 feet and collected numerous rock chip samples. At the East Marsha Peak prospect the company blasted 3 trenches and collected 74 rock chip samples. At the Huff prospect work consisted of collaring two diamond drill holes, conducting a geophysical survey (resistivity), and mapping the area. El Paso dropped its option in 1973 (George and Wyckoff, 1973).

Between 1976 and 1981, AMAX Exploration, Inc. (AMAX) mapped the area, drilled four holes, ranging in length from 506 to 2,727 feet, and collected thousands of samples in the vicinity of a biotite granite stock located in the northwest corner of the Groundhog Basin area. This work was done to evaluate the potential for porphyry molybdenum deposits. The option was dropped in 1981 (AMAX Exploration Inc., 1979[?]; 1981).

In 1988 Newberry and Brew (1989) reported on the classification of the Groundhog Basin deposit after examining both core samples and previously published company data. In 1992 Kennecott Exploration Co. briefly examined the property and evaluated earlier company reports (Wakeman, 1992).

As of 2002 there are no active claims in the Groundhog Basin area. Four patented claims still cover the Groundhog Basin prospect.

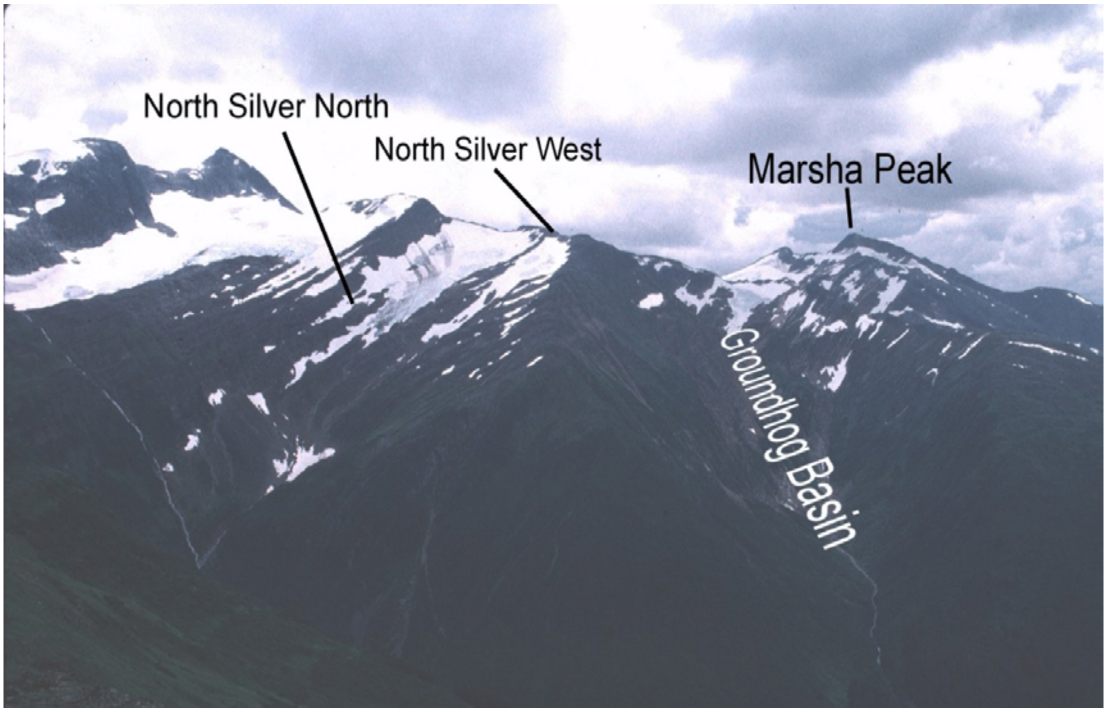

Photo 19. View of Groundhog Basin area from the northwest. Photo by P. Bittenbender.

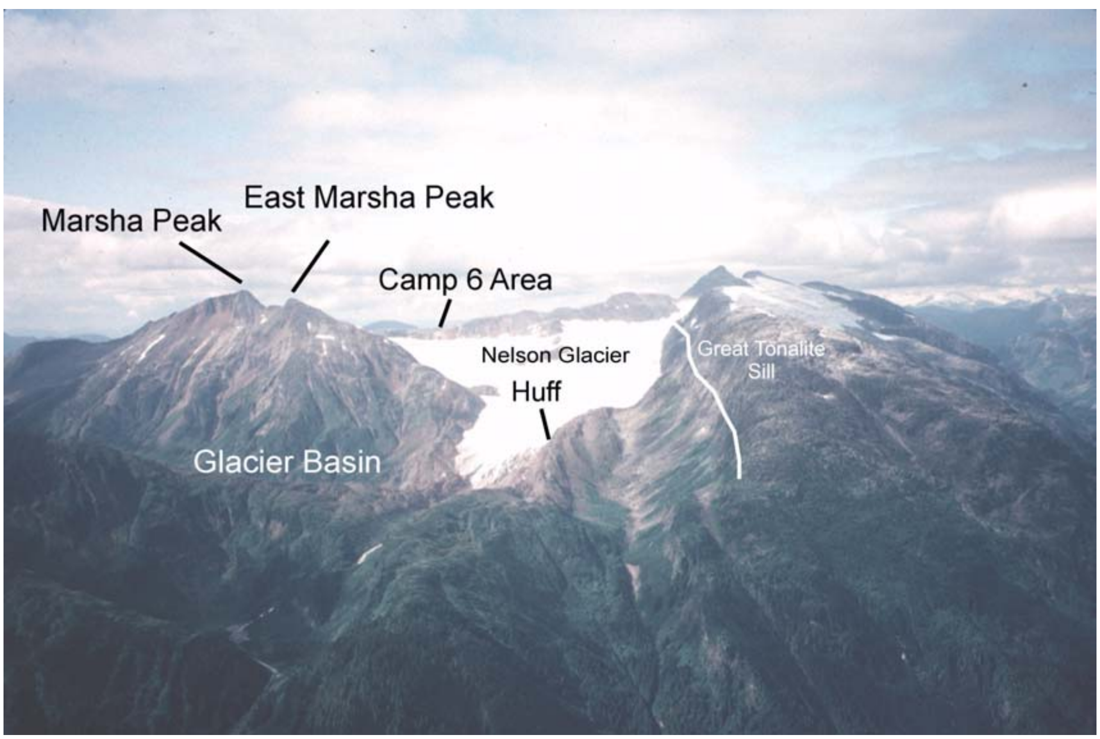

Photo 20. View of Groundhog Basin from south. Photo by P. Bittenbender.

NORTH SILVER NORTH

(Plate 3, Figure 27, Map no. 93)

MAS no.:	0021170165	*Quadrangle:*	Petersburg C1
Deposit Type:	PV, Skarn: Ag, Pb, Zn	*Latitude:*	56.5228
Land Status:	Open Federal	*Longitude:*	-132.0417
Development:	7 DDH, trenches	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	High

Location/Access

The North Silver prospect is at the northern end of the Groundhog Basin area, 13 miles east of Wrangell. The topography and vegetation in the area are steep alpine with glaciers or permanent snow fields to the south, east, and west (photo 19). Elevations range from 3,500 to 4,000 feet. Access is by helicopter.

History

During the late 1950's, the Moneta Porcupine Co. staked claims and explored in the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). William Huff discovered the North Silver North prospect in 1963. In 1965 the claims were optioned by the Bunker Hill Mining Co., which drilled 7 holes, ranging in length from 85 to 224 feet, and blasted several pits (fig. 27). The option on the property was dropped at the end of the field season (Bunker Hill Company, 1965a). From 1968 to 1970, Humble Oil and Refining Co. optioned the property (Humble Oil and Refining Company, 1970a). Later, from 1971 to 1973, El Paso Natural Gas Co. optioned the property and conducted geophysics and sampling on the western side of the prospect (George and Wyckoff, 1973). AMAX Exploration Inc. optioned the property from 1976 to 1981 (AMAX Exploration Inc., 1981).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed, Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite “tin” granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks in the Groundhog Basin area has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical.

At the North Silver North prospect crosscutting, northeasterly trending, steeply dipping shears in gneiss and schist host irregular, pinch-and-swell, quartz-sulfide lenses and veins. The veins are up to 4 feet thick, and systems of veins can be traced for hundreds of feet. Near the east end of these veins limestone beds up to 30 feet thick host replacement sulfide mineralization.

The two most prominent veins are along the Black Bear fault and the Camp fault. Less than 10 percent of the length of the fault system contains significant quartz and sulfides. These veins dip toward each other and are less than 80 feet apart at their closest surface location.

The Black Bear vein strikes 10° and dips 80° east and measures from 0.1 to 4 feet thick. It can be traced for approximately 1,000 feet, and consists of irregular, scattered quartz sulfide lenses. The sulfides are pyrite, sphalerite, and galena. The best mineralization found along the Black Bear vein was at its southernmost exposure near an old pit, where the vein is at its widest. A 4-foot sample across the vein contained 39.1 ppm silver, 3.3 percent lead, and 2.39 percent zinc (map no. 93.13, sample 8973). Fifteen feet south of this sample, the vein is only 1.0 foot thick. A 1-foot sample collected here contained 92 ppm silver, 9.9 percent lead, and 4.1 percent zinc (map no. 93.14, sample 585). In 1965 the Bunker Hill Mining Co. drilled the Black Bear vein approximately 300 feet to the north of the old pit (diamond drill hole [DDH] B23). The hole intercepts the vein and three of its splays at depths from 10 to 65 feet. The best intercept assayed 0.62 oz/t silver and 2.2 percent zinc across 1.0 foot. The next best sample assayed 2.9 oz/t silver, 6.71 percent lead, and 1.6 percent zinc across 0.13 foot (Bunker Hill Company, 1965a, 1965b).

The Camp vein strikes 50° and dips 70° north and measures from 0.25 to 4 feet thick. It can be traced for approximately 350 feet, and consists of irregular, scattered quartz sulfide lenses. The sulfides are pyrite, sphalerite, and galena. The best mineralization found along the Camp vein is near its southernmost exposure, where the vein is 0.45 feet thick. A sample across this part of the vein contained 119.32 oz/t silver, 22.5 percent lead, and 3.6 percent zinc (map no. 93.18, sample 124). At a location 150 feet to the northeast, a sample across a galena lens 0.25 feet thick assayed 84.30 oz/t silver, 48.61 percent lead, and 2.9 percent zinc (map no. 93.8, sample 9587). The remainder of the samples range in length from 0.3 to 5 feet long and contain from 10.2 ppm to 1,727.6 ppm silver, 1,463 ppm to 22.9 percent lead, and 2,803 ppm to 3.8 percent zinc (map nos. 93.5-93.7, 93.9-93.11, 93.16, 93.17, 93.19, samples 125, 587, 588, 985, 8830-8833, 9586).

Two marble beds, from 4 to 50 feet apart and up to 20 and 30 feet thick, are located to the east of the veins described above. These beds, known as the Port and Huff Marble, can be traced for thousands of feet. They strike 330° and dip 45° to the east. BLM examination of the beds indicated that approximately 600 feet contained scattered, irregular bands and lenses of disseminated to massive pyrite, sphalerite, and galena (the area between DDH 19 and 21). The crosscutting shears in the area were probably the conduit for mineralization in the beds. Only a small part of the width and length of the beds is mineralized. These bands and lenses are from 0.5 to 9 feet thick and extend from 3 to 100 feet. The best mineralized sample contained 58 ppm silver, 5,114 ppm lead, and 12,758 ppm zinc across 6.0 feet (map no. 93.24, sample 597). A sample across a 0.1-foot-wide band of massive sulfides contained 728.8 ppm silver, 5.16 percent lead, and 6.4 percent zinc (map no 93.21, sample 601). The remaining measured samples are from 0.5 to 9 feet long and contain from 8.8 to 37.2 ppm silver, 705 to 7,611 ppm lead, and 1,436 to 16,793 ppm zinc (map nos. 93.1-93.3, 93.22, 93.23, 93.25, 93.27, samples 589, 599, 607, 8840-8842, 8848).

The Bunker Hill Mining Co. DDH's B17 to B22 penetrate either one or both of these marble beds along a strike length of approximately 1,500 feet (Bunker Hill Company, 1965a). The drilling indicates that only a small part of the marble beds are mineralized. The best mineralized zone in DDH B18 was an 8.5-foot intercept that contained 2.34 oz/t silver and 0.51 percent lead. In DDH B19, a 0.5-foot section assayed 1.2 oz/t silver, 0.9 percent lead, and 3.1 percent zinc. In DDH B22, a 0.5-foot section assayed 3.16 oz/t silver, 10.66 percent lead, and 1.4 percent zinc. DDH's B21 and B17 did not contain significant mineralized intervals (Bunker Hill Company, 1965b).

Conclusions

Only small areas within the veins and marble examined by the BLM and private companies at the North Silver North prospect are mineralized. The mineralized veins pinch and swell and have irregular values, so are not good candidates for mineral development. The mineralized limestone, as indicated by drilling, is low-grade and discontinuous. However, vein sample values up 119.32 oz/t silver, 48.61 percent lead, and 4.1 percent `zinc (at higher-grade locations) encourage exploration of the area for more continuous mineralization (map nos. 93.8, 93.14, 93.18, sample 124, 585, 9587). Whereas the veins appear to be too narrow to encourage exploration, the size and extent of the limestone beds present an attractive exploration target. The limestone is apparently very reactive to the mineralizing solutions that deposited lead, and zinc along the veins. This has been demonstrated by the mineralized rock intersected by drilling. Areas where the limestone is sufficiently sheared to form a conduit for mineralizing solutions may prove to be fruitful exploration targets

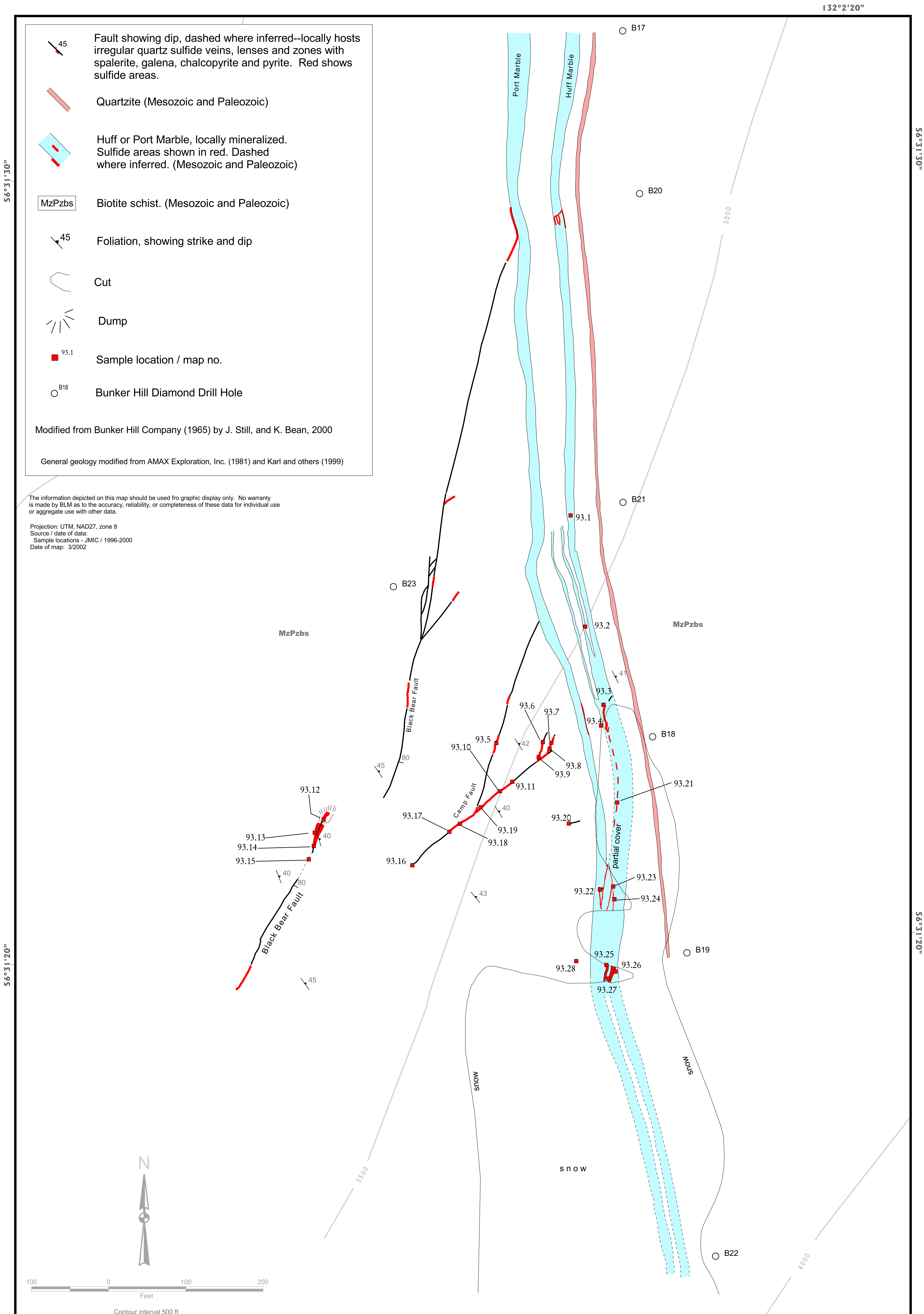

Figure 27. Map of the North Silver North prospect.

NORTH SILVER WEST

(Plate 3, Map no. 94)

MAS no.:	0021170166	*Quadrangle:*	Petersburg C1
Deposit Type:	PV, Ag, Pb, Zn	*Latitude:*	56.5154
Land Status:	Open Federal	*Longitude:*	-132.0439
Development:	4 pits	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The North Silver West prospect is located on a topographic bench at the northern end of the Groundhog Basin area 13 miles east of Wrangell. The topography and vegetation in the area are steep alpine with glaciers or permanent snow fields to the north, and steep cliffs to the south, east, and west (photo 19). Elevations range from 4,000 feet to 4,300 feet. Access is by helicopter.

History

During the late 1950's, the Moneta Porcupine Co. staked claims and explored in the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). William Huff discovered the North Silver West prospect in 1963. In 1965 the claims were optioned by the Bunker Hill Mining Co., which blasted several pits. The option on the property was dropped at the end of the field season (Bunker Hill Company, 1965a). From 1968 to 1970, Humble Oil and Refining Co. optioned the property (Humble Oil and Refining Company, 1970a). Later, from 1971 to 1973, El Paso Natural Gas Co. optioned the property and conducted geophysics and sampling on the western side of the prospect (George and Wyckoff, 1973). AMAX Exploration Inc. optioned the property from 1976 to 1981 (AMAX Exploration Inc., 1981).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed, Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks in the Groundhog Basin area has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical.

The North Silver West prospect consists of a crosscutting shear zone up to 10 feet thick that strikes 020° to 040° and dips from 50° to 89° to the southeast (figure. This shear zone has a 0.5- to 4-foot-thick mineralized section in its footwall that consists of massive and disseminated sulfides. It is irregular, pinches and swells, and is hosted in schist and gneiss.

Four pits, or cuts, expose the mineralization through soil and turf cover in the west area. The northernmost pit exposes the mineralization where it drops down the northern edge of the bench under a permanent snow field. In the southernmost pit, located 185 feet from the northernmost, both the mineralization and shear are markedly dissipated. Examination of bedrock exposures farther to the south failed to reveal the mineralized shear zone. Measured samples across 0.5 to 4.9 feet collected from the three northernmost pits contained from 31.3 ppm to 79.46 oz/t silver, from 1,795 ppm to 33.47 percent lead, and from 2,734 ppm to 9.8 percent zinc (map no. 94.1-94.3 samples 122, 431, 432, 8693, 9584-85). A 4.0-foot sample across the southernmost pit contained 19.7 ppm silver, 1,678 ppm lead, and 1,286 ppm zinc (map no. 94.3, sample 435).

Conclusions

The North Silver West mineralized vein, is narrow, pinches and swells and has erratic base metal and silver values. However there are sufficient silver and lead values, up to 79.46 oz/t silver and 33.47 percent lead, to attract some exploration interest.

NORTH SILVER WHISTLEPIG ADIT

(Plate 3, Map no. 95)

MAS no.:	0021170167	*Quadrangle:*	Petersburg C1
Deposit Type:	PV: Ag, Pb, Zn	*Latitude:*	56.5195
Land Status:	Open Federal	*Longitude:*	-132.0514
Development:	Adit, cuts	*MDP:*	Low
BLM work:	Sampled	*MEP:*	High

Location/Access

The North Silver Whistlepig Adit prospect is located at the northern end of the Groundhog Basin area approximately 13 miles east of Wrangell. It is located near the top of the cirque at the south end of Groundhog Basin. The topography and vegetation in the area are steep alpine with glaciers or permanent snow fields to the east, and steep cliffs to the north, south, and west. Elevations range from 3,900 feet to 4,200 feet. Access is by helicopter.

History

During the late 1950's, the Moneta Porcupine Co. staked claims and explored in the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). In 1965 the claims were optioned by the Bunker Hill Mining Co. The option on the property was dropped at the end of the field season (Bunker Hill Company, 1965a). From 1968 to 1970, Humble Oil and Refining Co. optioned the property (Humble Oil and Refining Company, 1970a). Later, from 1971 to 1973, El Paso Natural Gas Co. optioned the property and conducted geophysics and sampling on the western side of the prospect (George and Wyckoff, 1973). AMAX Exploration Inc. optioned the property from 1976 to 1981 (AMAX Exploration Inc., 1981). During the 1970s a mine car and rails were slung into the area, tent platforms were installed, and an adit was started (photo 21).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed, Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite “tin” granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks in the Groundhog Basin area has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical.

The Whistlepig adit is on a southwest-facing cliff at an elevation of 4,050 feet, just below the pass between Nelson Glacier and Groundhog Basin. The adit was likely started during the 1970's to intersect narrow, silver-bearing, galena-quartz veins that are exposed in the cliff above and to the north of the adit (photo 21). The adit was started but never completed and consists of 20 feet of trench and a few feet of adit that exposes sheared, iron-stained, silicified gneiss with small vugs of quartz and fluorite. A 3.6-foot sample across the gneiss contained 954 ppm lead, 399 ppm zinc, and 11.9 ppm silver (map no. 95.5, sample 8694).

The narrow, quartz-sulfide veins exposed in the cliff (above and north of the adit at elevations of 4,150 to 4,200 feet) strike northeasterly and dip steeply. The veins pinch and swell and may extend for up to 50 feet along strike. They are mineralized irregularly and are from 0.2 to 1.0 foot thick. Samples from the veins contained from less than 5 to 4,345 ppb gold, 11.5 ppm to 517.62 oz/t silver, from 778 ppm to 39.75 percent lead, from 377 ppm to 11.0 percent zinc, and 17 to 1497 ppm tin (map nos. 95.1-95.4, 95.8, samples 438-439, 120-121, 430). These samples were collected near the top and bottom of the cliff. BLM investigators observed old, deteriorated fixed ropes hanging in the middle of the cliff face where previous workers had presumably sampled the veins. The adit and veins exposed in the vicinity are not mentioned in previous company reports.

Photo 21. Mike Coonrod, helicopter pilot, examining ore cars at the North Silver Whistlepig Adit prospect. The adit was driven in the late 1970's to intersect a high-grade, lead-silver vein. Photo by J. Still.

Conclusions

The North Silver Whistlepig Adit prospect veins pinch and swell and have erratic base metal and silver values. While narrow and irregular these veins contain sufficiently high silver values, up to 517.62 oz/t silver (map no. 95.3, sample 121), to attract exploration interest.

AMAX Molybdenum

(Plate 3, Map no. 96)

MAS no.:	0021170045	*Quadrangle:*	Petersburg C1
Deposit Type:	Porphyry: Mo	*Latitude:*	56.5187
Land Status:	Open Federal, Private	*Longitude:*	-132.0607
Development:	4 DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate name:	Moly 1-12		

Location/Access

The AMAX Molybdenum prospect is on the northern side of Groundhog Basin, approximately 13 miles east of Wrangell. The area is predominated by steep cliffs and alpine vegetation; however, the lower elevations are brushy. Elevations range from 2,000 to 4,000 feet. Access is by helicopter and by climbing steep, loose rock. The prospect is centered on a granite stock. A small part of the western side of the stock and adjacent rocks is covered by patented mining claims (MS 1580). The remainder of the area is Federal land that is open to mineral entry. The claims that were staked to cover the molybdenum occurrence are not currently active.

History

Molybdenum in the Groundhog Basin area was first reported by Smith (1930) and briefly described by Gault (1953). AMAX Exploration Inc. (AMAX) was the first company to drill the Groundhog Basin vicinity for porphyry molybdenum deposits. Between 1976 and 1981, AMAX drilled four holes, which ranged in length from 506 to 2,727 feet, in the vicinity of a biotite granite stock (AMAX Exploration Inc., 1979[?], 1981).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Mapping by AMAX indicates the biotite granite stock forms a 1,000-by-2,000-foot outcrop. Drill logs indicate that the molybdenite is found along fractures in granite (up to two fractures per foot) and to a lesser extent along bedding plane fractures in gneiss and schist. The molybdenite is associated with quartz and fluorite stringers and vugs, sericite, and chlorite alteration and small amounts of tungsten (Hamilton, 1982b). Sixteen AMAX surface samples collected from the northwest corner of the stock and from 1,000 feet into the surrounding volcanic and sedimentary rocks contained from 6 to 190 ppm molybdenum. Three AMAX samples collected south of the northwest corner of the stock contained from 250 to 5,000 ppm molybdenum (details regarding sample type and length were not available). Six AMAX samples collected over a distance of 600 feet from the southeast part of the stock and from adjacent volcanic and sedimentary rocks contained from 6 to 65 ppm molybdenum (AMAX Exploration Inc., 1981; Hamilton, 1982a).

The four AMAX drill holes were collared to the northwest, west, and south of the granite stock. All were angled toward the stock. The northwest hole (A1) reached a depth of 2,454 feet and bottomed in the stock. The best 100 feet from this hole averaged 25 ppm molybdenum. The west hole (A4) reached a depth of 2,072 feet, bottomed in the stock, and had a best 100 feet that averaged 28 ppm molybdenum. Two holes (A2, A3) were drilled from the south. One, in gneiss its entire length, reached a depth of 506 feet and contained no significant molybdenum values (A2). The other reached a depth of 2,727 feet, bottomed in the stock, and contained from 55 to 60 ppm molybdenum from a depth of 2,500 to 2,727 feet (A3) (AMAX Exploration Inc., 1981; Hamilton, 1982b).

Because AMAX diamond drilling and surface sampling explored this prospect in sufficient detail, BLM work was confined to locating diamond drill holes and examining the prospect in the vicinity of the biotite-granite stock. The BLM's investigation revealed coatings of quartz and molybdenite along fractures in the biotite granite and gneiss. A sample of biotite granite with molybdenite along fractures contained 5,392 ppm molybdenum (map no. 96.1, sample 144).

Conclusions

The molybdenum mineralization revealed by surface sampling and drilling in the intrusive and adjacent metamorphic rock is too low-grade to be of economic significance. Similar zinnwaldite "tin" granite intrusives may exist elsewhere in the Groundhog Basin area. They would be considered exploration targets for porphyry molybdenum deposits.

NORTHEAST CLIFFS

(Plate 3, Map no. 97)

MAS no.:	0021170168	*Quadrangle:*	Petersburg C1
Deposit Type:	PV: Zn, Sn	*Latitude:*	56.8884
Land Status:	Open Federal	*Longitude:*	-133.3666
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Northeast Cliffs prospect is located near the northern end of the Groundhog Basin area, approximately 13 miles east of Wrangell. The area is alpine with steep cliffs and ranges in elevation from 3,100 to 4,200 feet. Access is by helicopter to the north or south of the prospect and then by foot to the mineralized outcrops.

History

The Northeast Cliffs prospect was investigated by AMAX Exploration Inc.(AMAX) between 1976 and 1981 (AMAX Exploration Inc., 1981). The claims are currently inactive.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding. The rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. The mineralization at the Northeast Cliffs is situated along the bedding plane shears.

The Northeast Cliffs prospect consists of a 0.5-mile-long, west-facing cliff made up of gneiss, schist, and rhyolite. Old, frayed fixed ropes attest to previous examinations in the area. The BLM's investigation of the prospect was confined to the northern and southern ends of the cliff. Investigators found iron-stained, silicified gneiss and rhyolite that contained disseminated pyrite, chalcopyrite, galena, and sphalerite. They collected four samples up to 2 feet long from the most mineralized areas. The samples contained from 112 to 980 ppm copper, 1,569 to 9,559 ppm zinc, and from 58 to 1,941 ppm tin (map nos. 97.1-97.3, samples 418, 419, 427, 2834).

AMAX collected 40 samples from the Northeast Cliffs area. They contained up to 840 ppm zinc and 13 ppm silver (AMAX Exploration Inc., 1981; Hamilton, 1982a)

Conclusions

The BLM and AMAX's sampling of the Northeast Cliffs prospect failed to reveal significant mineralization.

GROUNDHOG BASIN

(Plate 4, Map no. 98)

MAS no.:	0021170018	*Quadrangle:*	Petersburg C1
Deposit Type:	PR: Zn, Pb, Sn, Ag	*Latitude:*	56.9988
Land Status:	Open Federal, Private	*Longitude:*	-133.8633
Development:	4 adits, 27 DDH.	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Groundhog Basin deposit is at the northwest end of the Groundhog Basin area, approximately 13 miles east of Wrangell. The area consists of a deep gorge that trends north-northwest, with steep, loose rock cliffs to the east and west and a cirque at its southern end (photo 22). Elevations range from 1,450 to 3,600 feet, with thick brush predominating at the lower elevations and bare rock at the top. Avalanche snow accumulates in the floor of the gorge and commonly covers the rocks until late in the season. Access to the prospect is via helicopter to a landing spot in the gorge. The area is covered by four patented claims.

History

The Groundhog Basin deposit was discovered in 1904. Between 1915 and 1917, Don Alaska explored the deposit, which by 1917 had four adits started on the prospect (Buddington, 1921). In 1918 the Alaska Treadwell Gold Co. examined the property (Wernecke, 1918). Buddington investigated it in 1921 for the USGS (Buddington, 1923). In 1930 a patent (MS 1580) was issued for four claims on the property (Smith, 1943).

In 1942 Ventures, Ltd. optioned the property and by 1943 had sampled it and drilled 3 holes with depths of 107 to 335 feet. The company estimated resources of 116,000 tons at an average grade of 8.3 percent zinc, 2.5 percent lead, and 2 oz/t silver for a 4-foot average width (Smith, 1943). In 1943 the USGS mapped the area and estimated several hundred thousand tons of solid ore at an average grade of 8 percent zinc, 1.5 percent lead, and 1.5 oz/t silver and several hundred thousand tons of disseminated ore[3] at an average grade of 2.5 percent zinc and 1.0 percent lead (Gault, 1953). The Bureau of Mines examined the property in 1943 and estimated 120,000 indicated tons and 350,000 inferred tons. Both of these estimates were based on an average grade of 8.3 percent zinc, 2.5 percent lead, and 2.0 oz/t silver with an average width of 4 feet (Muir, 1943). A 1944 War Minerals report estimated the indicated tonnage at 124,000 tons with an average grade of 8 percent zinc, 2 percent lead, and 2 oz/t silver at an average width of 4 feet (U.S. Bureau of Mines, 1944).

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[3]The terms “solid ore” and “disseminated ore” are preserved here so as not to misinterpret the conclusions of previous investigators. The terms identify the higher and lower grade parts of the deposit and are not used in an economic sense.

In 1965 the Bunker Hill Mining Co. optioned the Groundhog Basin property. The area optioned included 294 claims, known as the Whistlepig claims that cover areas to the north, east, and south of the Groundhog Basin deposit. The company collected surface samples and drilled 24 holes with lengths of 25 to 350 feet. No new reserves were reported as a result of this work, and the property option was dropped at the end of the 1965 field season (Bunker Hill Company, 1965a, 1965b).

Photo 22. Groundhog Basin from Adit 1 showing the upper part of the basin. Ore beds number 3 and 4 are on the east (left) side of the basin. Photo by J. Still

Between 1968 and 1981, Humble Oil and Refining Co., El Paso Natural Gas Co., and AMAX Exploration Inc. optioned the Whistlepig-Groundhog Basin area. These companies concentrated their mapping, sampling, and drilling to the north, east, and south of the Groundhog Basin deposit (Humble Oil and Refining Company, 1970a; George and Wyckoff, 1973; Hamilton, 1982).

In 1983 Houston Oil and Minerals Exploration Co. collected 19 channel samples of massive sulfide ore from the Groundhog Basin deposit. The 19 samples averaged 7.3 percent zinc, 2.2 percent lead, 0.17 percent copper, 0.39 percent tin, and 1.91 oz/t silver with an average width of 3.25 feet (Oliver, 1984). This is the only reported tin average from the Groundhog Basin deposit.

In 1988 Newberry and Brew (1989) examined core and previously published company data and reported on the classification of the Groundhog Basin deposit. In 1992 Kennecott Exploration Co. briefly examined the property and evaluated earlier company reports (Wakeman, 1992).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical.

The Groundhog Basin deposit is situated in the western part of the belt of metamorphic rocks, adjacent to the granodiorite, which has an eastern contact that approximately follows the regional north-northwest trend of the regional rocks. Immediately north of the Groundhog Basin deposit, the 16.3-million-year-old biotite granite stock intrudes the metamorphic belt. In places sulfides replace the metamorphic rocks where they have been metamorphosed to pyroxene granulite. These sulfide zones are tabular. They follow the original bedding in the rocks (330°) and have been called "ore beds" by previous workers (e.g., Gault, 1953). Rhyolite sills occur adjacent to the ore beds.

Four conformable, parallel ore beds have been delineated in Groundhog Basin and in the cirque and pass to the south (pl. 4). These strike 335 to 345° and dip 40 to 55° northeast. They are separated by 15 to 80 feet, with rhyolite sills, schist, and gneiss in between. The rhyolite sills become dikes and cross the ore beds at one point. Disseminated and solid ores have been identified in the beds. The solid ore, mainly confined to the northern (1900 feet to 2400 feet elevation) part of the two eastern beds, consists predominately of massive bands of sulfides. The disseminated ore, mainly found in the southern (above 2400 feet elevation) part of the beds and in the western two beds, consists of disseminations, pods, and discontinuous bands of sulfides. The sulfides are pyrrhotite, pyrite, sphalerite, galena, and chalcopyrite with a gangue of quartz, hornblende, pyroxene, epidote, and garnet. Cassiterite is also found in the ore beds (Smith, 1943; U.S. Bureau of Mines, 1944; Berryhill,1964).

The westernmost (no. 1, lowest stratigraphically) ore bed has been traced from Adit 1 to the southeast for 4,300 feet horizontally and 1,900 feet vertically (Bunker Hill Company, 1965a). Gault (1953) reports that it contains zinc along its entire length. The next highest ore bed stratigraphically (no. 2) can only be traced a short distance. Sampling and mapping indicate that these two beds (nos. 1 and 2) contain mostly disseminated sulfides (where mineralized) and are not sufficiently mineralized to be considered important economically.

The two easternmost ore beds (nos. 3 and 4) can be traced from Adit 2 to the southeast for 3,500 feet horizontally and 1,600 feet vertically (Bunker Hill Company, 1965a). Surface sampling, three adits (nos. 2, 3, and 4), and three diamond drill holes have defined a solid ore resource that is 250 feet deep by 705 feet long in the number 4 ore bed and 250 feet deep by 405 feet long in the number 3 ore bed over an average width of 4 feet. This deposit contains 116,000 indicated tons (Smith, 1943) at an average grade of 8 percent zinc, 2.5 percent lead, 2 oz/t silver, and 0.39 percent tin (Muir, 1943; Oliver, 1984). Both Muir (1943) and Oliver (1984) report that the solid ore extends 1,200 feet farther to the northwest, where talus now covers the bedrock. If this is true, an additional 350,000 tons can be inferred at the same grade (Muir, 1943). These are indicated and inferred resources and do not constitute "ore" in the economic sense. These resources are located approximately between 1200 feet northwest of Adit 2 to DDH B 12 (pl. 4)

The Bunker Hill Mining Co. drilled 23 shallow holes both in the numbers 3 and 4 ore beds and in the area along strike to the northwest in 1965. Plate 3 and 4 show the locations of the diamond drill holes, the mine workings, and the number 3 and 4 Ore beds. Thirteen of the holes explored the area along strike to 4,500 feet to the northwest of Adit 1 (pl. 3, Bunker Hill DDH holes B1, B2, B4-B9, B11, B13-B16). Two of the holes explored the number 3 and 4 ore beds in the vicinity of Adit 2 and 1000 feet to the southeast in the area of solid ore and indicated and inferred resources (pl. 4, Bunker Hill DDH holes B10, B12). Eight of the holes explored the beds to the southeast of the area of solid ore and indicated and inferred resources for a distance of 2,200 feet (pl. 3, Bunker Hill DDH holes B24-B32; Bunker Hill Company, 1965a, 1965b).

In general, the Bunker Hill Mining Co.'s 23 holes confirmed the values in the area of solid ore previously delineated, and failed to find additional resources to the northwest and to the southeast of the solid ore. To the northwest, eight of the holes did not contain significant mineralization; four of the holes contained from 1.0 percent zinc across 1 foot to 3.9 percent zinc across 1 foot. The two holes in the numbers 3 and 4 beds in the area of solid ore contained from 9.5 percent zinc across 1 foot to 5.1 percent zinc and 4.1 percent lead across 5 feet, which approximately agrees with the grade of the estimated resources. To the southeast, two of the holes did not contain significant mineralization; six of the holes contained from 1.1 percent zinc across 2 feet to 4.8 percent across 5 feet. This drilling tested the near surface of the numbers 3 and 4 ore beds through a horizontal distance of 3,500 feet (pl. 3, DDH holes B10-B31) and a vertical distance of 1,600 feet, and the area along strike to the northeast of Adit 1for a horizontal distance of 4,500 feet and a vertical distance of 700 feet. The Bunker Hill Mining Co. drilling to the northwest and to the southeast of the area of solid ore revealed grades well below those of the indicated and inferred resources. Bunker Hill did not report new resource figures as a result of its efforts. (Bunker Hill Company, 1965a, 1965b).

The BLM's investigation of the Groundhog Basin deposit revealed four adits (pl. 4). These are located at elevations of 1,600 feet (Adit 1), 1,850 feet (Adit 2), 2,050 feet (Adit 3), and 2,130 feet (Adit 4). Adit 1 is 17 feet long and open. It exposes the number 1 ore bed. Adit 2 is 246 feet long and open. It exposes the numbers 2, 3, and 4 ore beds. Adit 3 is located in the middle of a cliff and was not examined because of the precipitous ground. Its portal appears to be open. Adit 4 is 14 feet long and is open. It exposes the number 4 ore bed.

BLM sampling of the adits was mostly confined to taking grab samples from the dumps and a few underground samples. Samples from the Adit 1 dump contain up to 6.4 oz/t silver, 1,300 ppm copper, 5.91 percent lead, 16.03 percent zinc, and 10,000 ppm tin (map no. 98.2, samples 99, 265, 2610, 8836). A 3-foot sample collected underground across the number 1 ore bed contains 159 ppm silver, 1,285 ppm copper, 2.72 percent lead, 12.9 percent zinc, and 1,176 ppm tin (map no. 98.2, sample 8837). Samples collected from Adit 2 of the number 4 ore bed contain from 9.9 ppm to 1.9 oz/t silver, 419 to 3,400 ppm copper, 40 to 2,900 ppm lead, 8.9 to 14.4 percent zinc, and from 481 to 6,488 ppm tin (map no. 98.5, samples 264, 593, 2611). A grab sample was collected from Adit 4 of the number 4 ore bed where it is 6 feet thick. It contains 141 ppm silver, 1,772 ppm copper, 10.57 percent lead, 7.7 percent zinc, and 1,604 ppm tin (map no. 98.7, sample 98).

A 4-foot-long sample collected across the number 4 ore bed at a location 50 feet north of Adit 4 contains 24.3 ppm silver, 1,500 ppm copper, 400 ppm lead, and 5.1 percent zinc (map no. 98.6, sample 2612). A 3-foot-long sample collected from the number 3 ore bed at a location 100 feet southerly from Adit 4 contained 35.7 ppm silver, 1,185 ppm copper, 368 ppm lead, 12.3 percent zinc, and 65 ppm tin (map no. 98.8, sample 263). In general BLM samples collected underground (Adits 2 and 4) and on the surface of the numbers 3 and 4 ore beds correlated with the average solid (massive) ore grade of 8 percent zinc, 2.5 percent lead, and 2 oz/t silver reported in 1943 (Muir, 1943).

Samples were collected from the numbers 3 and 4 ore beds at the cirque located at the south end of Groundhog Basin (2,650 foot elevation). Here the beds are separated by approximately 75 feet of schist and rhyolite sills. The number 3 ore bed is exposed for 150 feet along the north bank of the creek that drains the cirque. The number 3 ore bed splits into two beds separated by approximately 7 feet of schist. The lower split is approximately 3 feet thick and is partly covered by the creek. The upper split is approximately 2 feet thick. Samples across the lower split averaged 24 ppm silver, 2,099 ppm copper, 1.06 percent lead, 2.07 percent zinc, and 913 ppm tin (map nos. 98.9, 98.13-98.15, samples 615, 616, 627-629). Samples across the upper split averaged 10.6 ppm silver, 142 ppm copper, 528 ppm lead, 3.56 percent zinc, and 295 ppm tin (map nos. 98.9, 98.13, samples 617, 626). The number 4 ore bed is exposed for several feet in a cut located approximately 75 feet northeast of the number 3 ore bed. It is 4 to 8 feet thick with poorly defined footwall and hanging wall. A 2-foot sample from the cut contained 3,610 ppm zinc and 884 ppm tin (map no. 98.17, sample 8856). A 4-foot select sample across the bed contained 8.7 ppm silver, 2,072 ppm copper, 518 ppm lead, 4.5 percent zinc, and 973 ppm tin (map no. 98.17, sample 8855).

The number 4 ore bed is exposed in a cut at a pass to the south of the cirque, at approximately 3,550 feet elevation. A 3.7-foot sample from the cut contained 6.7 ppm silver, 2,477 ppm copper, 40 ppm lead, 16,936 ppm zinc, and 592 ppm tin (map no. 102.1, sample 641).

Conclusions

The best Groundhog Basin mineralization that is currently developed is the solid ore in the numbers 3 and 4 ore beds exposed in Adits 2, 3, and 4, in three pre-1944 diamond drill holes, and on the surface between elevations of 1,900 and 2,400 feet. This represents 466,000 tons of indicated and inferred resources at an average grade of 8 percent zinc, 2.5 percent lead, 2 oz/t silver, and 0.39 percent tin. These beds are parallel and dip 40-55° northeast. They are separated by 50 to 75 feet of mostly barren schist, and each averages 4 feet thick. This is too low-grade, too narrow and too small to be considered an attractive development target. Ore beds numbers 1 and 2, and numbers 3 and 4 above 2,400 feet, and the area along strike to the northwest have values well below that of the solid ore. While they may constitute several million tons, they are too low-grade and narrow to be considered for development.

The replacement nature of the ore beds, proximity of the intrusive to the mineralized zones, and mineralogy of the Groundhog Basin deposit indicate that the most suitable deposit classification is polymetallic replacement. Typical polymetallic replacement deposits contain approximately 1.8 million tons, and the largest deposits are between 14 and 90 million tons (Cox and Singer, 1986). To date, exploration of the Groundhog Basin deposit has been near the surface. The mineralization explored in the 4 ore beds extends for 2,000 feet of depth and 4,000 feet along strike. Exploration of the deposit to a greater depth may reveal an attractive development target.

COPPER ZONE

(Figure 28, Map no. 99)

MAS no.:	002170163	*Quadrangle:*	Petersburg C1
Deposit Type:	Porphyry: Cu, Zn	*Latitude:*	56.8810
Land Status:	Open Federal	*Longitude:*	-134.0736
Development:	9 DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Copper Zone prospect is on the north-facing wall of a cirque at the head of Groundhog Basin, approximately 13 miles east of Wrangell (photo 23). The area, above tree line with permanent snow fields, ranges in elevation from 3,000 to 4,000 feet. Access is by helicopter via a helipad at 3,600 feet elevation.

History

The first reported work on the Copper Zone was by El Paso Natural Gas Co. During 1972 the company carried out a geophysical survey (resistivity), drilled 9 holes, and collected 1,044 rock chip samples (George and Wyckoff, 1973). There are currently no active claims in the area.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

The BLM's investigation of the Copper Zone revealed rhyolite sills up to 60 feet thick that generally follow the foliation in the gneiss and schist. Fractures that are parallel to and crosscut (trend to the northeast) the foliation host disseminated chalcopyrite. Rarely, lenses and bands of massive chalcopyrite and pyrrhotite up to 0.4 feet thick occupy the fractures. Chip samples up to 0.7 feet long across the better-mineralized lenses and bands contained up to 4,580 ppb gold, 19.65 oz/t silver, 8.1 percent copper, 1.71 percent lead, 2.65 percent zinc, and 1,728 ppm tin (map nos.99.8, 99.9, samples 131, 133, 9596). Five samples, 12 to 25 feet long were taken from areas of disseminated mineralization (fig. 28). They contained from 2.3 to 48.5 ppm silver, 155 to 800 ppm copper, 45 to 581 lead, and 456 to 1,870 ppm zinc (map nos. 99.3, 99.5-99.7, samples 990-992, 8989, 8990).

El Paso Natural Gas Co.'s 1,044 rock chip samples from the Copper Zone area delineate a 125-by-160-foot zone that averages 0.11 percent copper. Lower-grade samples define an anomalous strike length of approximately 500 feet. Sampling to the southwest of the known mineralized area indicates the zone is not continuous in that direction (George and Wyckoff, 1973).

The 9 drill holes range in length from 58 to 442 feet in the Copper Zone area. One hole penetrated the northwestern corner of the 125-by-160-foot zone and averaged 0.11 percent copper over a length of 70 feet (E2). This 70-foot intercept also contained from 135 to 6,650 ppm zinc, from 2 to 66 ppm silver, and from 19 to 53 ppm molybdenum. The remaining 8 holes were collared up to 400 feet north, 1,500 east, and 1,500 feet southeast of the above hole. All failed to intersect significantly mineralized rock (George and Wyckoff, 1973).

Conclusions

The copper mineralization revealed by surface sampling and drilling in the rhyolite, schist, and gneiss of the Copper Zone is too small and too low-grade to be an attractive development target. If areas down dip and along strike can be detected that are more fractured and that have a more reactive host rock, they may prove to be better exploration targets.

Photo 23. View of the North Silver Whistlepig Adit and Copper Zone prospects. Note the prominent orange stain at the Copper Zone. Photo by J. Still.

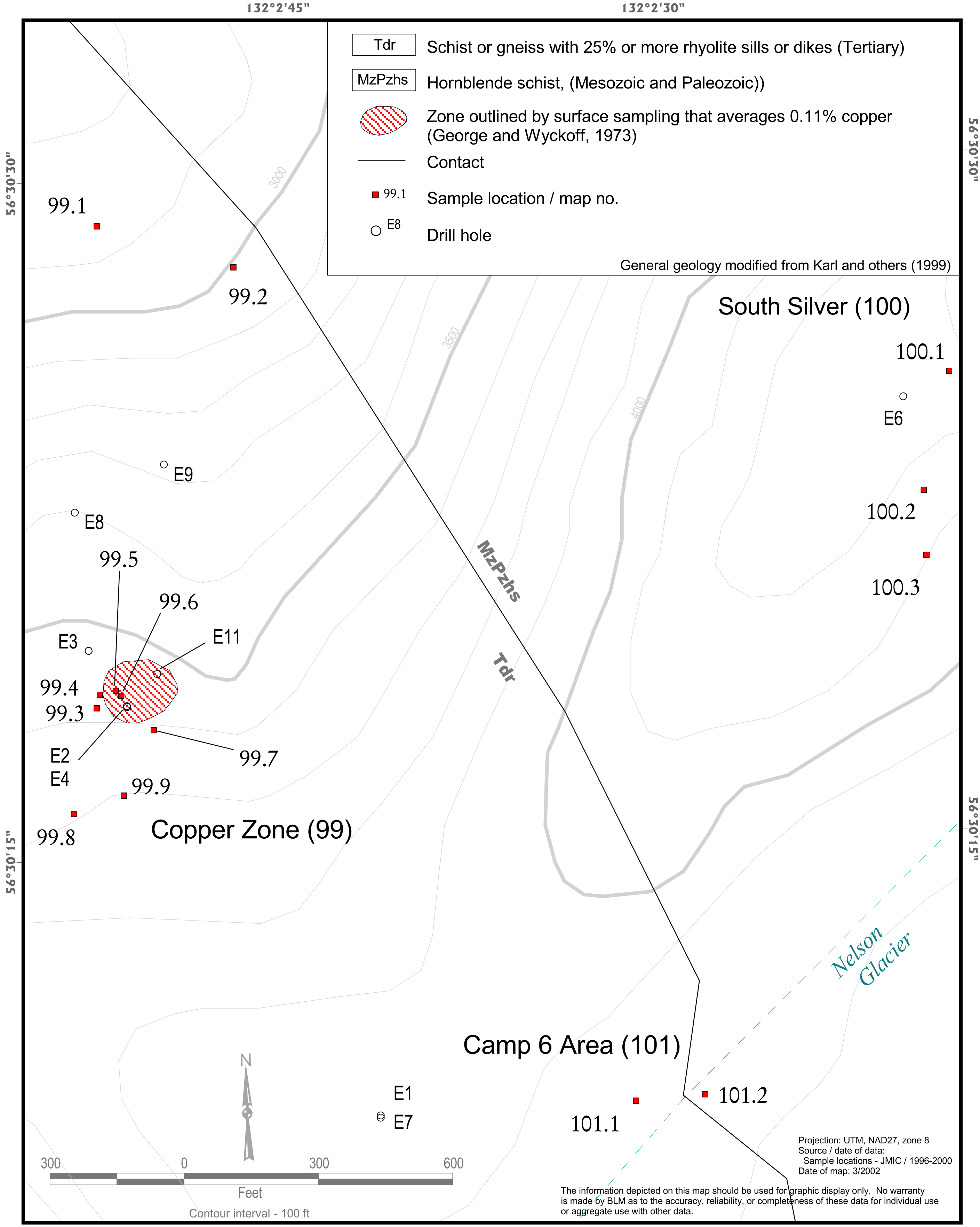

Figure 28. Map of the Copper Zone, South Silver, and Camp 6 Area prospects.

SOUTH SILVER

(Figure 28, Map no. 100)

MAS no.:	0021170169	*Quadrangle:*	Petersburg C1
Deposit Type:	PV: Zn, Pb, Ag	*Latitude:*	56.5071
Land Status:	Open Federal	*Longitude:*	-132.0387
Development:	1 DDH	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Low

Location/Access

The South Silver prospect is near the northern end of the Groundhog Basin area, approximately 13 miles east of Wrangell. The area is alpine. Elevations range from 3,900 to 4,362 feet at the summit of an unnamed peak in the area. Access is by helicopter.

History

The South Silver prospect was first drilled and sampled by El Paso Natural Gas Co. between 1971 and 1973. The claims are not currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. The mineralized rock at the South Silver prospect follows both the bedding plane and crosscutting shears.

The BLM's investigation of the South Silver prospect revealed a quartz vein/stringer zone up to 10 feet thick located near the summit of a 4,362-foot peak. The vein/stringer zone follows shears in the gneiss that are approximately parallel to foliation. Rhyolite sills and schist along with the gneiss form the country rock in the area. BLM investigators collected four samples from the mineralized zone (map nos. 100.1-100.3, samples 428, 8690-92). Sample 8691 contained 63.9 ppm silver and 1,417 ppm lead. Sample 8690 contained 1,089 ppm tin (fig. 28).

El Paso Natural Gas Co. sampled along a line that extended from near the summit of the 4,362-foot peak in a south-southwesterly direction for 1,900 feet. The company collected over 200 samples along this line. The six best samples contained from 840 to 1,655 ppm zinc and from 320 to 2,720 ppm lead. These were from 5 to10 feet long. Near the summit of the peak, the company collared a 149-foot-deep, inclined drill hole that angled south-southwest (E6). A 32-foot intercept consisted of rhyolite and granulite with sphalerite- and galena-bearing quartz stringers and averaged 0.7 percent zinc, 1.0 percent lead, and 0.3 oz/t silver (George and Wyckoff, 1973).

Conclusions

Drilling and sampling of the South Silver prospect failed to reveal significant mineralized rock.

CAMP 6 AREA

(Figure 28, Map no. 101)

MAS no.:	0021170162	*Quadrangle:*	Petersburg C1
Deposit Type:	PV: Zn, Ag	*Latitude:*	56.5028
Land Status:	Open Federal	*Longitude:*	-132.0417
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Camp 6 Area is located at the pass between Groundhog basin and Nelson Glacier, approximately 13 miles east of Wrangell. The area is alpine and ranges in elevation from 3,900 to 4,000 feet. The Nelson Glacier is immediately to the east. Access is by helicopter.

History

Camp 6 was the site of an exploration camp first used by El Paso Natural Gas Co. that consisted of two trailers and several small buildings. The claims are not currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. The mineralized rock at the Camp 6 Area follows both the bedding plane and crosscutting shears.

The BLM's investigation of the Camp 6 Area revealed narrow silicified iron-stained shear zones along the margins of rhyolite sills and in the gneiss containing pyrrhotite, chalcopyrite, galena and sphalerite. Samples from the zones contained up to 58 ppm silver, 1,976 ppm copper, 1,324 ppm lead, and 9.5 percent zinc (fig. 28; map nos. 101.1, 101.2, samples 8815-17).

Conclusions

The Camp 6 Area mineralized shear zones are too narrow and low-grade to constitute an exploration target.

LAKE CIRQUE

(Figure 29, Map no. 102)

MAS no.:	0021170164	*Quadrangle:*	Petersburg C1, B1
Deposit Type:	PR: Zn, Pb, Sn	*Latitude:*	56.9055
Land Status:	Open Federal	*Longitude:*	-134.1317
Development:	None	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The Lake Cirque prospect is at the south end and east side of a west-facing cirque on the west side of the Groundhog Basin area, approximately 13 miles east of Wrangell. The topography and vegetation in the area are alpine with glaciers and permanent snow fields to the south and east. A steep 500-foot cliff rises on the east wall of the cirque. Elevations range from 2,950 to 4,000 feet. Access is by helicopter.

History

During the late 1950's, 1960's, and 1970's a number of companies were active in the Groundhog Basin area and included the Lake Cirque area in their claim blocks. During most or all of that time, the south and east parts of the cirque were covered with permanent snow fields. During 1965 the Bunker Hill Mining Co. traced the number 4 ore bed from the Groundhog Basin deposit to the pass on the north side of the Lake Cirque and 200 feet down from the pass on the north side of the Lake Cirque. The Bunker Hill Co. drilled a hole in the pass and another in the north side of the Lake Cirque.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite “tin” granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical.

The Lake Cirque area is in the western part of the belt of metamorphic rocks, adjacent to the granodiorite, which has an eastern contact that approximately follows the regional north-northwest trend of the hosting rocks. About 4,000 feet north of the Lake Cirque area, the 16.3-million-year-old biotite granite stock intrudes the metamorphic belt. In places sulfides replace the metamorphic rocks, where they have been metamorphosed to pyroxene granulite.

The BLM's investigation of the Lake Cirque area revealed three zones of previously unreported mineralization, recently exposed because of the late season and a year with very low snow fall (fig. 29). The most easterly is located at an elevation of 3,400 feet and is called the east zone. The most westerly is located at an elevation of 3,500 feet and is called the west zone and the most southerly is located at an elevation of 3,700 feet and is called the south zone. In addition, during 1943 the USGS mapped a small area located 600 feet southerly from the south zone, at elevations from 3,900 to 4,000 feet (Gault,1943).

The east zone is located near the base of the east cirque wall(photo 24). Rhyolite sills make up at least half of the 500-foot east cirque wall. The zone is tabular. It follows the original bedding of the rocks and consists of calc-silicate gneiss replaced by chalcopyrite, galena, sphalerite, pyrite, and pyrrhotite. The zone strikes 345° and dips 50° east. It is exposed between snow fields and in a hole beneath the ice for a length of 500 feet. Five measured samples were collected from the zone. Across an average of 2.4 feet, the samples averaged 8.2 ppm silver, 752 ppm copper, 8,374 ppm lead, 5.13 percent zinc, and 842 ppm tin (map nos. 102.5, 102.7, 102.11, 102.13, samples 609, 612, 634-636).

The west zone is in an area of gneiss along a ridge 400 feet west of the east zone. The zone is approximately 3 feet wide by 80 feet long and averages 36.9 ppm silver, 2,381 ppm copper, 9,223 ppm zinc, and 3,267 ppm tin (map nos. 102.14-102.16, samples 8864-8866).

The south zone consists of an outcrop 30 by 150 feet that is surrounded by snow and ice. It is located along a crosscutting shear that strikes 010°, dips 55° east, and forms a shallow gulch. The shear is approximately 10 feet wide and consists of sheared gneiss with vuggy quartz veinlets. The hanging wall side of the shear consists of fractured calc-silicate gneiss, parts of which have been replaced by chalcopyrite and black sphalerite. Samples across 9 feet of the best mineralization found in this fractured gneiss average 3 ppm silver, 446 ppm copper, 1.68 percent zinc, and 567 ppm tin (map no. 102.17, samples 642, 643). Samples across select parts of the fractured gneiss from 0.3 to 1.0 foot long contain up to 12.7 ppm silver, 2,518 ppm copper, 191 ppm lead, 12.8 percent zinc, and 1,777 ppm tin (map nos. 102.17, 102.19, samples 638-640).

The area mapped by the USGS in 1943 is located at a pass on the south side of the cirque. It is 600 feet long and consists of rhyolite sills in gneiss. Irregular bands and lenses containing disseminated and massive pyrrhotite, galena, and sphalerite have replaced calc-silicate gneiss and are found along fractures. The most mineralized sample BLM personnel collected in the area was across a 2.7-foot-thick sulfide lens. It contained 130 ppm silver, 1,057 ppm copper, 1.06 percent lead, 2.8 percent zinc, and 757 ppm tin (map no. 102.21, sample 645).

Conclusions

The replacement nature of the ore beds, proximity of the intrusive to the mineralized zones, and mineralogy of the Lake Cirque east and west zones indicate polymetallic replacement is the most suitable deposit classification. The south and USGS zones are a combination of polymetallic vein and replacement. Typical polymetallic replacement deposits contain about 1.8 million tons, and the largest deposits are between 14 and 90 million tons (Cox and Singer, 1986). As explored by mapping and surface sampling, the Lake Cirque area zones are too narrow and low-grade to constitute a development target. However, the mineralization found in the east and south zones

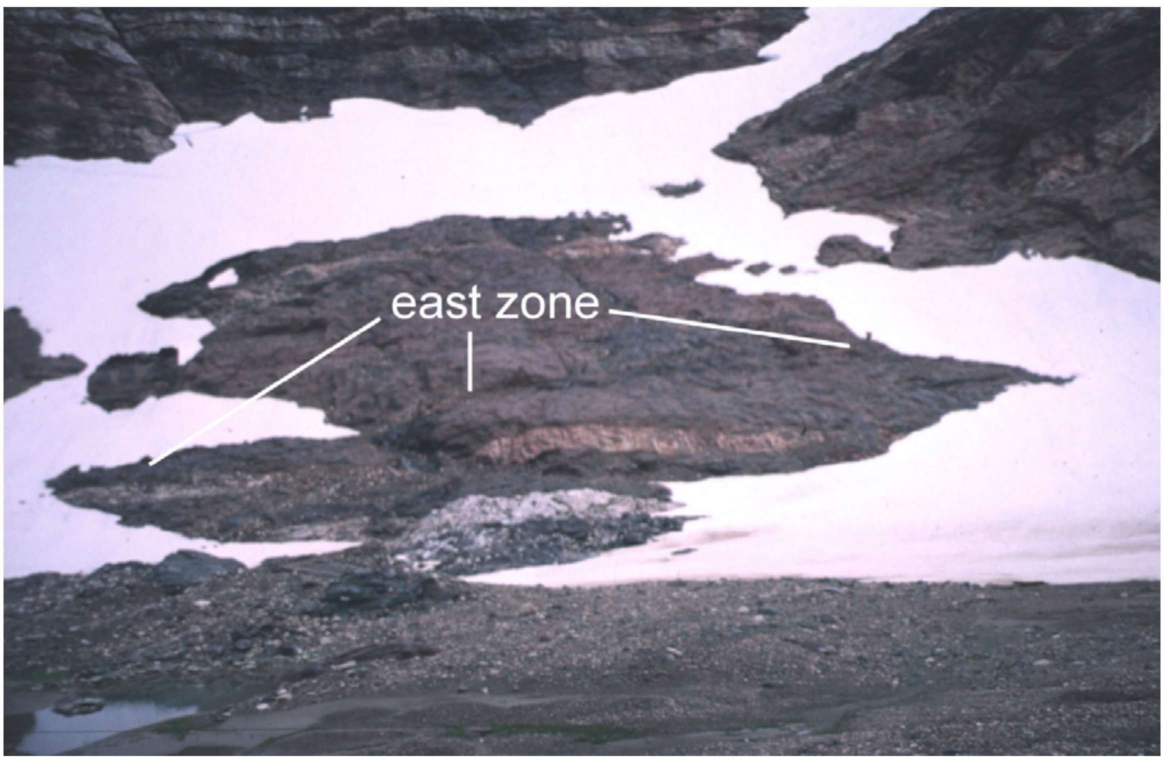

Photo 24. Lake Cirque prospect showing the conformable east zone located at the base of the east wall of the cirque. The mineralized zone is located above one of the numerous rhyolite sills in the area. Photo by J. Still.

is of sufficient extent and grade to consider exploration at depth and along strike where potentially mineralized rock is covered by permanent snow fields.

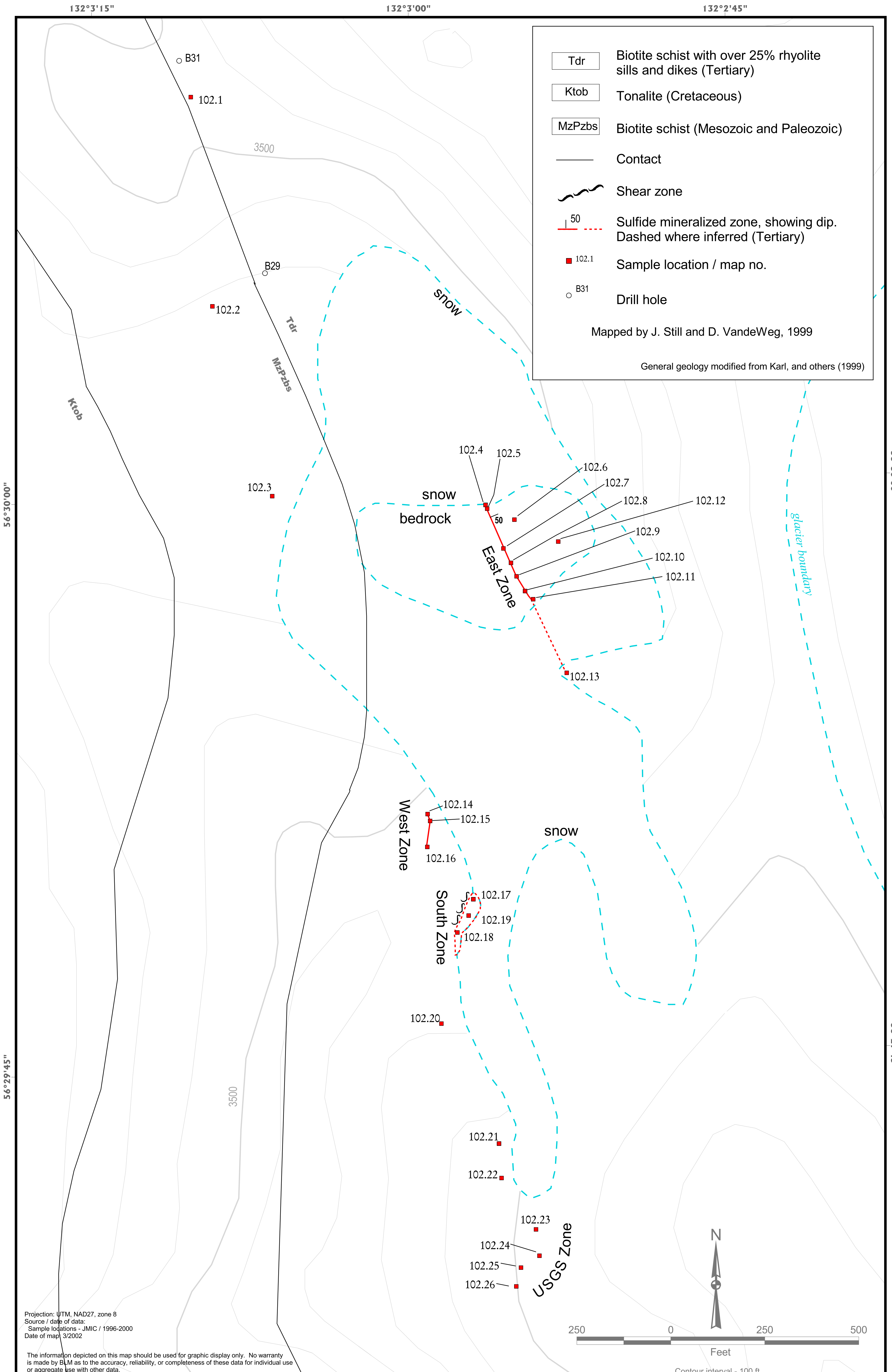

Figure 29. Map of the Lake Cirque prospect.

NORTH MARSHA PEAK

(Figure 30, Map no. 103)

MAS no.:	0021170158	*Quadrangle:*	Petersburg B1
Deposit Type:	PV: Zn, Pb	*Latitude:*	56.4928
Land Status:	Open Federal	*Longitude:*	-132.0431
Development:	3 DDH, trenches	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	Medium

Location/Access

The North Marsha Peak prospect is on the north ridge of Marsha Peak, approximately 13 miles east of Wrangell. The area is alpine and ranges in elevation from 3,900 to 4,400 feet. The Nelson Glacier is immediately to the east. Access is by helicopter.

History

In 1943 the USGS mapped the North Marsha Peak area (Gault, 1953). In 1965 this prospect was optioned by the Bunker Hill Mining Co. The property was dropped at the end of the field season in 1965 (Bunker Hill Company, 1965a). Between 1968 and 1970, Humble Oil and Refining Co. optioned the property and drilled two holes to the east of it through the Nelson Glacier ice (H1, H2) (Humble Oil and Refining Company, 1970a; 1970b). El Paso Natural Gas Co. (El Paso) optioned the property from 1971 to 1973 and conducted mapping and sampling. The company drilled three holes with lengths ranging from 116 to 230 feet (George and Wyckoff, 1973). AMAX Exploration Inc. optioned the property from 1976 to 1981 (Hamilton, 1982a, 1982b). In 1992 Kennecott Exploration briefly examined the property and the El Paso reports (Wakeman, 1992). No claims in the area are currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. Polymetallic mineralized zones follow both the bedding plane and crosscutting trends in the North Marsha Peak area.

El Paso collected 228 surface samples, blasted three trenches, and drilled three holes between the elevations of 4,000 feet at the western edge of the Nelson Glacier and 4,400 feet on the north side of Marsha peak. The exploration targeted two bedding plane shear zones that are separated by 750 feet of gneiss and rhyolite sills. These zones strike generally to the north and dip approximately 50° to the east (George and Wyckoff, 1973).

BLM work in the area was mostly confined to mapping and sampling the two bedding plane shear zones from elevations of 3,900 at the Nelson Glacier to over 4,300 feet on the north side of Marsha Peak (fig. 30).

The westernmost shear is from 4 to 12 feet wide and can be traced for 1,100 feet along strike. It is covered to the north by the Nelson Glacier. Samples from this zone indicate an average grade of 1.5 oz/t silver, 0.3 percent copper, 0.22 percent lead, and 0.58 percent zinc (George and Wyckoff, 1973). Samples collected in the vicinity of the westernmost shear zone at an elevation of 3,900 feet indicate a 15-foot section of gneiss that averages 1.70 oz/t silver, 0.22 percent copper, 0.76 percent lead, and 6.02 percent zinc (George and Wyckoff, 1973). The BLM sampled the westernmost shear between elevations of 4,300 and 4,400 feet where it is 10 feet wide and silicified. Samples up to 2.4 feet long from the more strongly mineralized part of the 10-foot-wide shear contained up to 5,661 ppb gold, 8.8 oz/t silver, 1.73 percent copper, 1,144 ppm lead, and 14.5 percent zinc (map nos.103.6-103.9, samples 440, 2642, 2643, 8697, 8698). BLM personnel collected samples across five feet of the shear at an elevation of 3,900 feet near the glacier that contained up to 5.0 ppm silver, 3,366 ppm lead, and 3,531 ppm zinc (map nos. 103.2, 103.3, samples 8818-8820).

Photo 25. Silver-rich galena vein in the east shear of the North Marsha Peak prospect. Note butterfly for scale. Photo by J. Still.

The easternmost shear is approximately 4 feet thick and can be traced for 600 feet along strike to the north where it is covered by the Nelson Glacier. Sampling of select thin veinlets from more mineralized parts of the shear gave values up to 20.7 oz/t silver, 70 percent lead, and 22 percent zinc (George and Wyckoff, 1973). BLM samples from 3.2 to 4 feet long across the easternmost shear contained from 15.2 to 72 ppm silver, 197 to 2,454 ppm copper, 3,305 ppm to 4.95 percent lead, and from 558 ppm to 18.74 percent zinc (map no. 103.4, samples 579, 8825, 8826). Samples of narrow bands, 0.4 to 0.5 feet thick, of sulfides within the shear contained from 30.1 to 938.9 ppm silver, 191 to 1,284 copper, 4,138 ppm to 62.87 percent lead, 9,089 ppm to 11.4 percent zinc, and up to 1,032 ppm tin (map nos. 103.4, 103.5, samples 576-578, 580, 581; photo 25).

Three drill holes were collared in the North Marsha Peak vicinity by El Paso. One hole (E13), collared 250 feet east of the westernmost shear at an elevation of 3,900 feet, was drilled parallel to fracturing in the country rock. It averaged 1.1 percent zinc and 0.25 percent lead along its entire 116-foot length. The second (E10), collared 150 feet east of the easternmost shear, cut a 13-foot zone that averaged 0.87 oz/t silver, 0.08 percent copper, 0.6 percent lead, and 4.3 percent zinc. The third hole (E12), collared 300 feet east from the easternmost shear, failed to cut significant mineralized rock (George and Wyckoff, 1973).

Conclusions

As exposed by sampling and drilling, the North Marsha Peak mineralized shear zones are too narrow and low-grade to constitute a development target. However, locally significant concentrations of mineralization and the extent of the shears may generate some exploration interest.

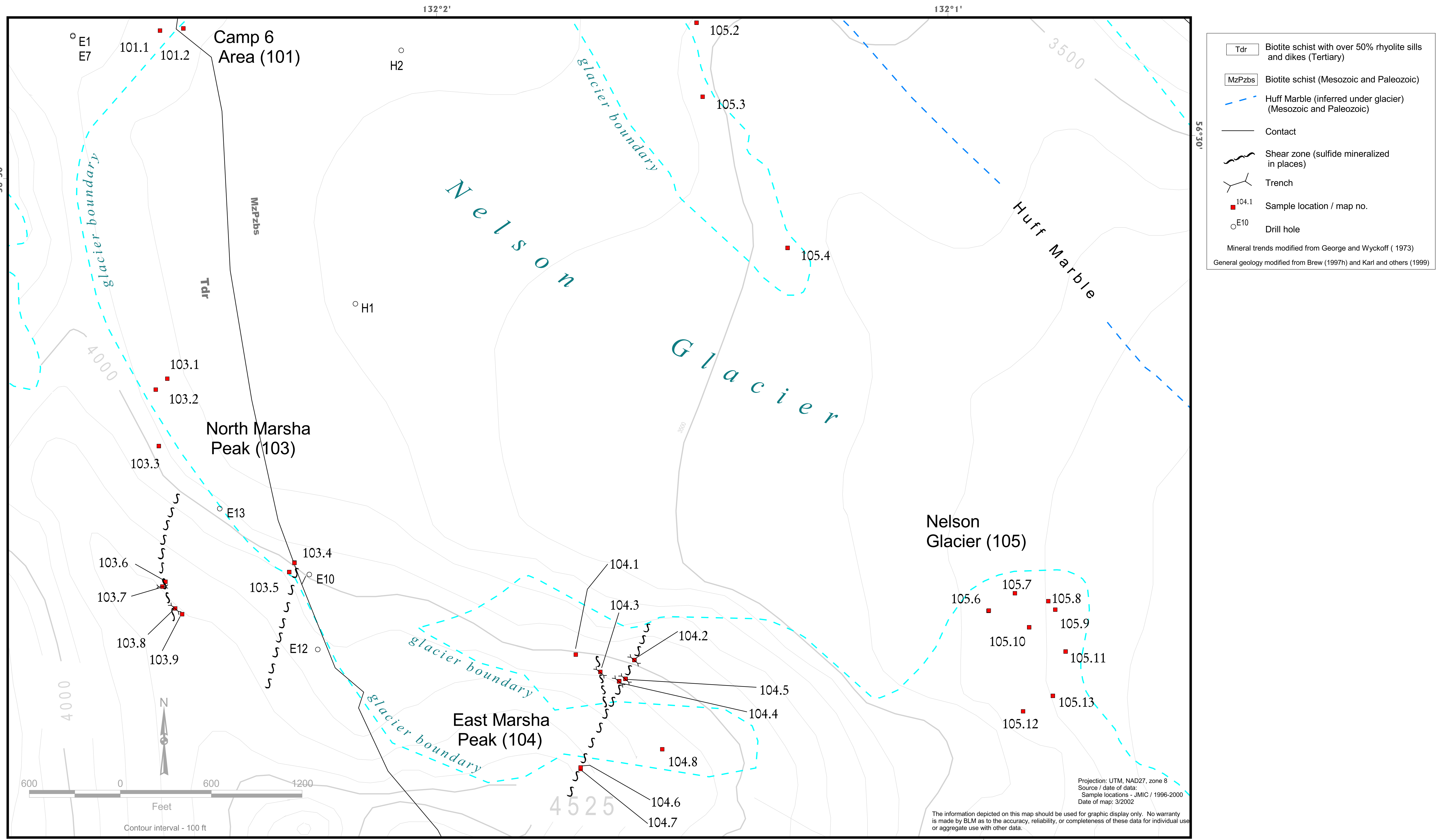

Figure 30. Map of the North Marsha Peak and East Marsha Peak prospects.

EAST MARSHA PEAK

(Figure 30, Map no. 104)

MAS no.:	0021170156	*Quadrangle:*	Petersburg B1
Deposit Type:	PV: Zn, Pb	*Latitude:*	56.5579
Land Status:	Open Federal	*Longitude:*	-133.0090
Development:	4 trenches	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	High

Location/Access

The East Marsha Peak prospect is on the northeastern slope of Marsha Peak, approximately 13 miles east of Wrangell. The area is alpine with permanent snow fields, glaciers, and steep cliffs. Elevations range from 3,500 to 4,500 feet, and snow covers the prospect until late in the season. Access to the prospect is via helicopter to a rocky, uneven landing site east of the prospect's trenches at an elevation of approximately 4,000 feet.

History

The East Marsha Peak prospect was first mapped and sampled by El Paso Natural Gas Co. (El Paso). During 1972 three trenches, with lengths from 20 to 60 feet, were cut between the elevations of 3,975 and 4,100 feet. El Paso collected 48 samples from the trenches and at least 26 more from the vicinity of the prospect (George and Wyckoff, 1973). They also flew a multilevel, helium magnetometer survey over the Whistlepig claim area (which included the East Marsha Peak prospect) in December 1972 (Quigley, 1973). Watts, Griffis, and McOuatt, Inc. (WGM) revised previous El Paso maps of the East Marsha Peak prospect area in 1976 (WGM, 1976). In 1992 Kennecott Exploration briefly examined the property and the El Paso reports (Wakeman, 1992). The claims are not currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Photo 26. Iron-stained, vuggy, silicified shear zone at the East Marsha Peak prospect (foreground). Across the Nelson Glacier is the 60-70 million-year-old "great tonalite sill," which sits on top of metamorphosed Paleozoic sedimentary and volcanic rocks that host most of the mineralization in the area. Photo by M. McDonald.

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. Mineralizing solutions that followed the crosscutting trend formed the East Marsha Peak deposit, which is made up of the "main" and "secondary" shear zones.

Main Shear Zone

The main East Marsha Peak shear zone consists of a crosscutting shear zone that strikes north-northeast to northeast, dips 50° to 75° southeast, and extends from near the 4,525-foot summit of East Marsha Peak down the northeastern slope of the peak and beneath the Nelson Glacier to an elevation of 3,500 feet. Between the summit of East Marsha Peak and Nelson Glacier, the shear zone extends for 2,000 feet along strike (fig. 30). The shear zone is hosted in northwest-trending gneiss and varies from a width of 30 feet near the summit to 40 feet at the El Paso trenches at elevations between 3,975 and 4,100 feet. The hanging wall of the shear zone is highly silicified with vugs containing quartz and fluorite (photo 26). Sphalerite, galena, chalcopyrite, and pyrrhotite form masses and disseminations within the gneiss breccia and gouge. Mineralized rock is found along a network of fractures that penetrate the gneiss for up to 40 feet from the main silicified shear (George and Wyckoff, 1973).

The BLM's examination of the main East Marsha Peak shear zone revealed three trenches at elevations of 3,975, 4,075, and 4,100 feet that test the shear zone for a distance of 162 feet along strike and through a vertical distance of 125 feet. They range in length from 20 to 60 feet.

These workings do not exactly conform to the El Paso map, dated September 26, 1972, of the two trenches at elevations of 4,075 and 4,100 feet. Additional work accomplished by El Paso in October 1972 is not shown on the map of George and Wyckoff (1973). The hanging wall and footwall limits of the mineralization are irregular and difficult to delineate.

The BLM collected 16 samples from the trenches at 4,100 and 4,075 feet elevation and the immediate vicinity (map nos. 104.1, 104.4, 104.5,, samples 441-445, 451-453, 8699-702, 8704-07). The samples indicate pervasive zinc-lead mineralization. Samples from 0.5 to 11 feet long contained from 279 ppm to 2.42 percent lead and from 2,443 to 27.14 percent zinc. These samples also contained up to 78.7 ppm silver, 7,260 ppm copper, 288 ppm molybdenum, and 368 ppm tin. El Paso's sampling of the same trenches gave similar results. In the 4,075-foot-elevation trench, El Paso estimates a zone up to 30 feet thick that averages 3.19 percent zinc, 1.67 percent lead, and 1.99 oz/t silver. In the 4,100-foot-elevation trench, El Paso estimates a zone 13 feet thick that averages 1.45 percent zinc, 2.75 percent lead, and 1.23 oz/t silver with an additional 18 feet that averages 1.79 percent zinc and is only slightly anomalous in lead and silver (George and Wyckoff, 1973).

The BLM collected five samples from the 3,975-foot-elevation trench, located 140 feet northeast and along strike from the 4,075-foot-elevation trench (map no. 104.2, samples 446, 447, 449, 450, 8703). The samples indicate a mineralized zone approximately 20 feet thick. A 6-foot sample across part of the more mineralized rock contained 2.4 percent zinc and 11.1 ppm silver (map no. 104.2, sample 450). A select sample from the trench contained 14.2 percent zinc, 7,169 ppm copper, 2,483 ppm tin, and 139.3 ppm silver (map no. 104.2, sample 447). Steep cliffs and occasional rock fall precluded access to the zone between 3,975 feet and the glacier at 3,500 feet.

Above an elevation of 4,100 feet (i.e., to the southwest), the shear zone is covered by ice, but is exposed again near the summit of East Marsha Peak (4,525 feet elevation). Near the summit, the zone is approximately 30 feet thick and consists of vuggy, sheared quartz and brecciated gneiss. Sulfide mineralization is sparse. Two samples 0.3 feet long, collected after a brief examination of the zone for sulfides, contained from 6.8 to 12.9 ppm silver, from 518 to 655 ppm copper, from 932 to 3,980 ppm lead, and from 936 to 7,157 ppm zinc (map nos. 104.6, 104.7, samples 134, 135).

An aerial, multilevel, helium magnetometer survey was carried out across the main East Marsha Peak shear zone for El Paso in December 1972. It traces the zone to the east-northeast, under and to the other side of the Nelson Glacier. Quigley (1973) suggests that the south side of the shear zone is anomalous and a target for mineral exploration.

Secondary Shear Zone

A secondary mineralized shear zone is located west of the main East Marsha Peak shear zone described above (fig. 30). The BLM's examination revealed a 30-foot trench at an elevation of 4,075 feet that exposes a 20-foot-wide shear zone, which trends to the north and dips 75° to the east (photo 27). At 4,075 feet, it is located 70 feet west of the main shear and is similar to it. A 4-foot-thick basalt dike intrudes along the center of the shear. A 2-foot sample collected from the most mineralized part of the shear contained 49.6 ppm silver, 3.47 percent lead, and 16.14 percent zinc (map no. 104.3, sample 448). El Paso's sampling of the 4,075-foot-elevation trench indicated a 13-foot zone that averaged 1.35 oz/t silver, 1.60 percent lead, 3.83 percent zinc, and 0.08 percent copper (George and Wyckoff, 1973). To the south, the shear zone is covered by ice, and to the north, it is only intermittently mineralized. About 150 feet north of the trench, a 5-foot sample of the shear contained 2.6 percent zinc, and at a distance of 240 feet north of the trench, another 5-foot sample of the shear contained 4.24 percent zinc (George and Wyckoff, 1973).

Photo 27. Jan Still, mining engineer examining a massive sulfide zone along a secondary shear at the East Marsha Peak prospect. Photo by M. McDonald.

El Paso sampled along two grid lines each approximately 300 feet long; one was aligned northwest-southeast, starting near the trench at 4,100 feet elevation, and the other was aligned northeast-southwest, starting at the northwest end of the first line. The grid lines are to the northwest of the East Marsha Peak shear zone. They cover the secondary shear zone described above. Over lengths of 10 to 35 feet, El Paso's samples averaged from 0.15 to 4.05 percent zinc. One 5-foot sample located between the two shear zones contained 23.1 percent zinc (WGM, 1976; George and Wyckoff, 1973).

Conclusions

The East Marsha Peak shear zone mineralization is classified as polymetallic vein. However, there is also polymetallic replacement of calcsilicate gneiss within the shear zone. The East Marsha Peak shear zone, as it is currently understood, has the width and potential extent to make it an exploration target. To date, exploration of the East Marsha Peak shear zone has been limited to the surface. Exploration of this shear zone by drilling along strike to the northeast under the Nelson Glacier may reveal an attractive development target.

NELSON GLACIER

(Plate 3 , Map no. 105)

MAS no.:	0021170157	*Quadrangle:*	Petersburg B1, C1
Deposit Type:	PV?, Skarn: Ag, Pb, Zn	*Latitude:*	56.0522
Land Status:	Open Federal	*Longitude:*	-132.0992
Development:	2 DDH	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Nelson Glacier is about 14 miles east of Wrangell. It is flanked on the north by the North Silver prospect; on the west by the AMAX Molybdenum, Copper Zone, Groundhog Basin, North Marsha Peak, East Marsha Peak, and Glacier Basin prospects; and on the southeast by the Huff prospect (figure 26). Ranging in elevation from 2,200 to over 4,000 feet, the glacier is 3 miles long and up to 1 mile wide. The area is alpine, with cliffs and mountains on the east and west sides of the glacier. Marsha Peak and East Marsha Peak dominate the west side of the glacier. Access is by helicopter.

History

During the late 1950's, Moneta Porcupine Company explored the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). The Nelson Glacier was covered by a claim group that was optioned by a number of companies from 1965 to 1981. In 1965 the claims were optioned by the Bunker Hill Mining Co. The property was dropped at the end of the field season in 1965 (Bunker Hill Company, 1965a). Between 1968 and 1970, Humble Oil and Refining Co. optioned the property and drilled two holes through the Nelson Glacier (H1, H2) (Humble Oil and Refining Company, 1970a, 1970b). El Paso Natural Gas Co. (El Paso) optioned the claims from 1971 to 1973 and carried out geophysical surveys over the glacier (George and Wyckoff, 1973; Quigley, 1973). AMAX Exploration Inc. optioned the claims from 1976 to 1981 (Hamilton, 1982). In 1992 Kennecott Exploration reported on the mineral potential under the Nelson Glacier (Wakeman, 1992). In 1999 the block of claims that covered the Nelson Glacier were inactive except for five at the North Silver prospect.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1.5 miles wide that strikes about 330 and dips about 50 northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base-metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes about 025 (range 005 to 030) and dips 45 east to vertical. Polymetallic mineralized zones follow both the bedding plane and crosscutting trends. Both granulite and marble beds are replaced by polymetallic sulfides in the Groundhog Basin area.

A crude metal zonation is evident in the 1.5-mile-wide metamorphic belt of rocks in the Groundhog Basin area. Located immediately west of the glacier is the Copper Zone where copper-zinc predominates. Farther to the west, at the Groundhog Basin, Lake Cirque, North Marsha Peak, East Marsha Peak, and Glacier Basin prospects, zinc/lead predominates. To the northeast, at the North Silver prospect, silver/lead/zinc predominates. And to the southwest, at the Huff prospect, lead/zinc/silver predominates. In addition, tin is found in the Groundhog Basin and Lake Cirque deposits. Newberry and Brew (1989) report tin zonation centered around the 16.3-million-year-old biotite granite stock northeast of Groundhog Basin.

The Nelson Glacier covers up to two-thirds of the Groundhog Basin area. Mineralized zones from the North Marsha Peak, East Marsha Peak, and the Huff prospects can be traced under the glacier. Marble beds up to 30 feet thick trend under the toe of the glacier and are exposed 2.5 miles to the north-northwest at the head.. Farther to the north, these beds are mineralized at the North Silver North prospect. Predominantly lead/zinc/silver minerals replace the marble beds at the Huff and North Silver North prospects. Crosscutting shears are the conduit for the lead-zinc-silver-mineralizing fluids. Some of the shears have high-grade silver contents as well, with up to 228.4 oz/t at the Huff prospect (map no. 107.3, sample 96) and up to 517.62 oz/t at the North Silver prospect (map no. 95.3, sample 121).

To test the continuity of the North Marsha Peak mineralization under the Nelson Glacier to the northeast, Humble Oil drilled two holes through the ice. These holes were located 1,200 feet from the western edge of the glacier, northeast of the North Marsha Peak prospect. Both holes were vertical and over 1,700 feet deep. One penetrated 491 feet of ice; and the other, 621 feet before encountering rock. Both holes were predominantly in gneiss, and neither encountered significant mineralized rock. The best mineralized zone averaged 1.7 percent zinc, 0.4 percent lead, and 0.5 oz/t silver across 10 feet (H2) (Humble Oil and Refining Company, 1970a, 1970b).

BLM investigators found massive sulfide float at the toe of the Nelson Glacier, located at about 2,200 feet elevation, that was coming from under the ice. Similar float was found at a nunatak, at an elevation of 3,200 feet. Samples from this float contained up to 8.43 oz/t silver, 1.5 percent copper, 8.21 percent lead, 25.95 percent zinc, and 904 ppm tin (map nos. 105.8, 105.9, 105.14, samples 117, 119, 129). Similar mineralized float was reported by a Kennecott Exploration company geologist in 1991 (Wakeman, 1992).

An aerial, multilevel, helium magnetometer survey was carried out in the Groundhog Basin area in December 1972 for El Paso in order to evaluate the potential for mineralization under the Nelson Glacier. The magnetometer survey traced the East Marsha Peak shear zone east-northeast under the glacier and detected a north-south system of parallel shears intersecting the East Marsha Peak shear under the ice (Quigley, 1973).

Conclusions

The area under the Nelson Glacier is the least-explored part of the Groundhog Basin area. The intersection of mineralized east-northeast and north-south shear zones under the glacier and the presence of marble beds that also underlie the glacier make this an exploration target for zinc, lead, and silver replacement deposits.

WEST NELSON GLACIER

(Plate 3, Map no. 106)

MAS no.:	0021180146	*Quadrangle:*	Petersburg B1
Deposit Type:	PV: Pb, Ag, Zn	*Latitude:*	56.4786
Land Status:	Open Federal	*Longitude:*	-131.9971
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The West Nelson Glacier prospect is on the southwest side of Nelson Glacier, approximately 14 miles east of Wrangell. The area is alpine, ranging in elevation from 2,300 to 2,400 feet. Access is by helicopter.

History

The West Nelson Glacier prospect is located within a block of 120 claims that were optioned by the Bunker Hill Mining Co. in 1965. The option on the property was dropped at the end of the field season that year (Bunker Hill Company, 1965a). Between 1968 and 1970, Humble Oil and Refining Co. optioned the property (Humble Oil and Refining Company, 1970a). El Paso Natural Gas Co. (El Paso) optioned the block of claims from 1971 to 1973, which by then had been expanded to 295 claims. AMAX Exploration Co. optioned the property from 1976 to 1981. The claims are not currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. Polymetallic veins follow the crosscutting trend in the West Nelson Glacier area.

BLM work at the West Nelson Glacier prospect was confined to a brief investigation of the ridge crest southwest of the glacier at elevations of 2,300 to 2,400 feet. A crosscutting, 2-foot-wide, vuggy, silicified, shear zone that traces for 80 feet locally contains pyrite, chalcopyrite, galena, and sphalerite. The zone is hosted in gneiss. A 0.2-foot chip sample across the best sulfide mineralization contained 4.39 oz/t silver, 2.70 percent lead, 9,577 ppm zinc, and 8,363 ppm arsenic (map no. 106.2, sample 9603).

Conclusions

While the extent of the West Nelson Glacier mineralized zone indicates that it is of no economic importance, it and the other area prospects indicate pervasive silver-lead-zinc mineralization across a large area.

HUFF

(Figures 31, 32, Map no. 107)

MAS no.:	0021180069	*Quadrangle:*	Bradfield Canal B6
Deposit Type:	Skarn, PV: Pb, Zn, Ag	*Latitude:*	56.8894
Land Status:	Open Federal	*Longitude:*	-134.0722
Development:	2 DDH	*MDP:*	Low
BLM work:	Mapped, sampled	*MEP:*	High

Location/Access

The Huff prospect is on the east side of Nelson Glacier, near its toe, approximately 14 miles east of Wrangell. The area is alpine and is partly glaciated (fig. 31). Elevations range from 2,300 to 4,300 feet. Access is by helicopter.

History

During the late 1950's, the Moneta Porcupine Co. explored the Groundhog Basin area, but subsequently dropped its claims. With the permission of Moneta Porcupine, two former company prospectors, William Huff and James Fucas, continued work in the area and staked new claims (Berryhill, 1964). The Huff prospect was one of those claims. It was discovered in about 1963 by William Huff. In 1963 W.A. Race mapped and sampled the prospect for the Alaska Territorial Department of Mines (Race, 1963). In 1965 the Huff claims were optioned by the Bunker Hill Mining Co. During 1965 the company mapped and sampled the prospect, but dropped its option at the end of the field season (Bunker Hill Company, 1965a). Between 1968 and 1970, Humble Oil and Refining Co. optioned the property (Humble Oil and Refining Company, 1970a). El Paso Natural Gas Co. (El Paso) optioned the property from 1971 to 1973, carried out geophysical surveys, mapping, and sampling and drilled two holes with lengths of 99 and

Photo 28. The Huff Marble showing the massive sulfide zone. Mineralization is concentrated along the hanging wall (right). Photo by J. Still.

149 feet (George and Wyckoff, 1973). Watts, Griffis, and McOuatt, Inc. (WGM) revised previous El Paso maps of the Huff prospect in 1976 (WGM, 1976). AMAX Exploration Co. optioned the property from 1976 to 1981 (Hamilton, 1982a, 1982b). In 1992 Kennecott Exploration briefly examined the property and the El Paso reports (Wakeman, 1992). The claims are not currently active.

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. Polymetallic mineralized zones follow this crosscutting trend and replace marble beds in the Huff prospect area.

Marble Bed

The BLM's investigation revealed a marble bed up to 30 feet thick located 1,500 feet from the eastern edge of the belt of metamorphosed Paleozoic rocks (photo 28). The bed, hosted in schist and gneiss, strikes 325°, dips 40° to 55° to the northeast, and is exposed for a distance of approximately 4,500 feet. It is covered by rubble to the south and by the Nelson Glacier to the north. About 1,500 feet from its northern end, a 300-foot-long section of the marble bed is mineralized with sulfides. Polymetallic mineralizing fluids from crosscutting fractures and from along hanging wall fractures have replaced the marble to form a massive sulfide zone within the bed. Mineralized marble varying in width from 0.5 to 15 feet is confined to the hanging wall of the bed. Pyrrhotite, galena, sphalerite, and chalcopyrite replace the marble to form irregular lenses and bands of massive sulfides (photo 29). The crosscutting shears that are the conduits for the replacement sulfides contain vugs with quartz and fluorite and are only locally mineralized with sulfides.

BLM personnel collected five samples from five locations over a distance of 110 feet along strike of the better mineralization in the hanging wall (fig.32). The samples ranged in length from 1.4 to 7 feet and contained from 46.7 ppm to 4.6 oz/t silver, 2,688 to 7,330 ppm copper, 3.28 to 20.08 percent lead, and from 6.8 to 22.68 percent zinc (map nos. 107.8-107.12, samples 90-91, 254-255, 583). Three 4- to 6-foot-long samples collected by El Paso from the same area contained from 3.09 to 19.69 oz/t silver, 0.7 to 1.2 percent copper, from 15.9 to 24.9 percent lead, and from 7.1 to 9.3 percent zinc (fig. 32, samples 688E, 689E, and 692E; George and Wyckoff, 1973).


Photo 29. Sulfides have replaced marble along fractures at the Huff prospect. Photo by J. Still.

El Paso conducted ground geophysical surveys (EM) over the marble bed and, as a result, defined a sizeable zone of conductive material. In 1972 El Paso drilled two holes to intercept the marble bed and geophysical anomaly. One, 149 feet long, penetrated the massive sulfide zone 85 feet down dip (E14). A 7-foot width averaged 1.40 oz/t silver, 0.3 percent copper, 7.40 percent lead, and 4.30 percent zinc. The other hole, 99 feet long, failed to reach the mineralized zone (E15) (George and Wyckoff, 1973).

BLM personnel examined the marble bed that hosts the massive sulfide zone, both to the south and north of the sulfide zone, but did not find significant mineralization (fig. 31). Other thinner marble beds located in the area were also examined by the BLM, but these too lacked significant mineralization. El Paso's drilling discovered marble beds in the subsurface that are not elsewhere exposed (George and Wyckoff, 1973). There remains some potential for buried mineralized marble beds.

Cross Fractures

BLM investigators examined numerous narrow cross fractures to the north of the marble bed massive sulfide zone. Two of these, at distances of 150, and 2,400 feet from the marble bed massive sulfide zone, contained significant metal values (figs. 31, 32, map nos. 107.3, 107.7). They are irregularly mineralized with sulfides that pinch and swell. Druses and vugs of quartz and fluorite are common (photo 30). The predominate sulfides are galena and sphalerite. The best sample from the northernmost vein was 0.4 feet wide and contained 2,166 ppm gold, 228.40

oz/t silver, and 6.24 percent lead (map no. 107.3, sample 96). Three other samples across this vein did not contain significant metal values (map no. 107.3, samples 97, 262, 420). The best sample from the southernmost vein was 1.0 foot wide and contained 302 ppm silver, 6.80 percent lead, and 4.40 percent zinc (map no. 107.7, sample 984).

Photo 30. Silicified, vuggy, crosscutting vein from the north end of the Huff prospect. The vein pinches and swells and includes irregular lenses of silver-bearing galena. Photo by M. MacDonald.

Conclusions

The marble bed massive sulfide mineralization, as it is currently understood, is of sufficient grade to be of exploration interest. Deposition of sulfide minerals in the marble bed is dependent on cross fractures as a conduit for mineralizing fluids and fractures within the marble bed to allow for permeation and replacement. The high silver value of 228.4 oz/t in a cross fracture may be indicative of the potential for high-grade silver deposits in the area. Ground geophysics indicate a sizable conductor in the vicinity of the bed's mineralized zone. These factors encourage exploration of the marble beds in the Huff prospect area along strike and down dip by geophysics and drilling. Marble beds with sufficient fracturing, such as in fault zones where deposition of significant base metal and silver deposits are more likely, would be targets.

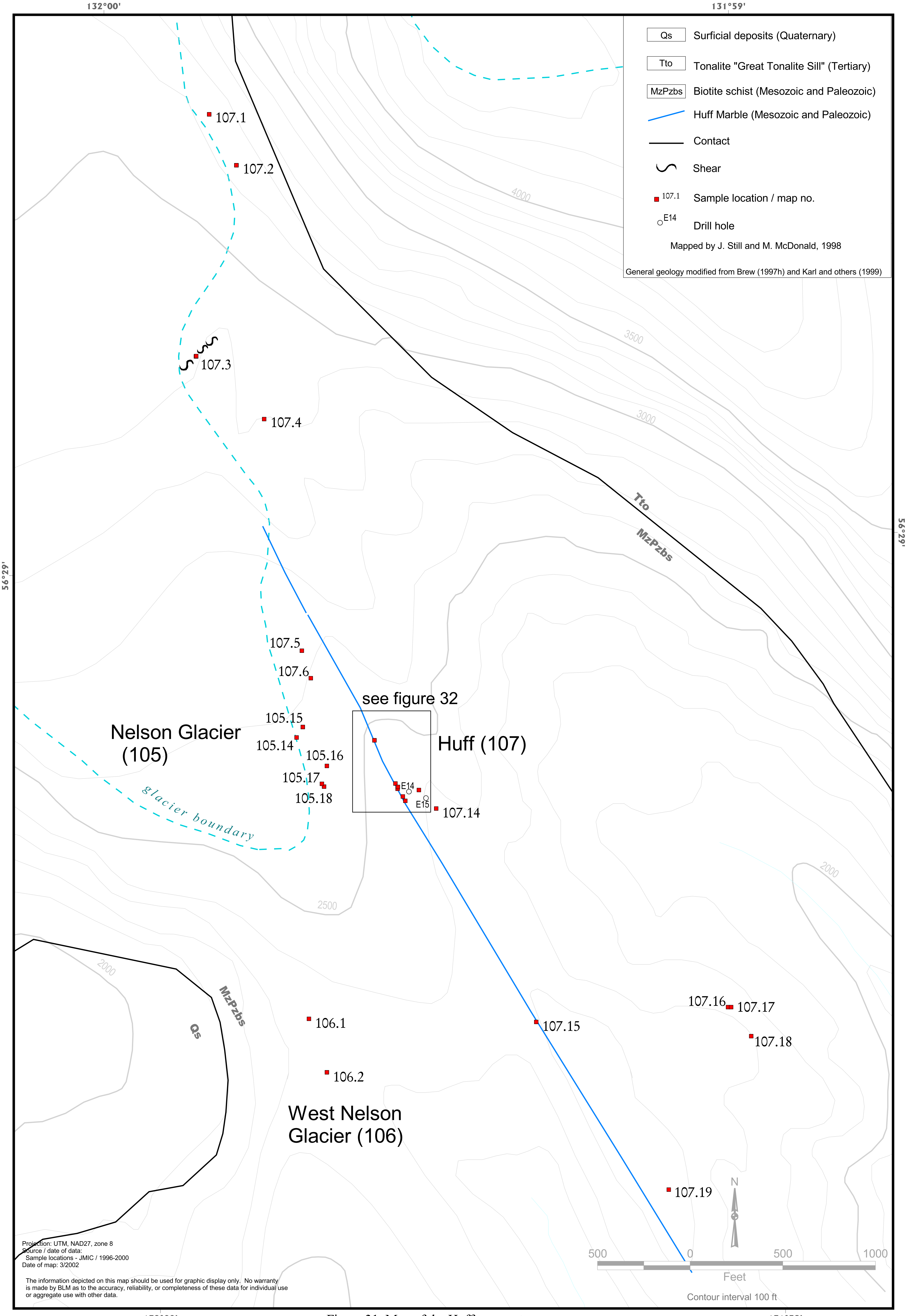

Figure 31. Map of the Huff prospect area.

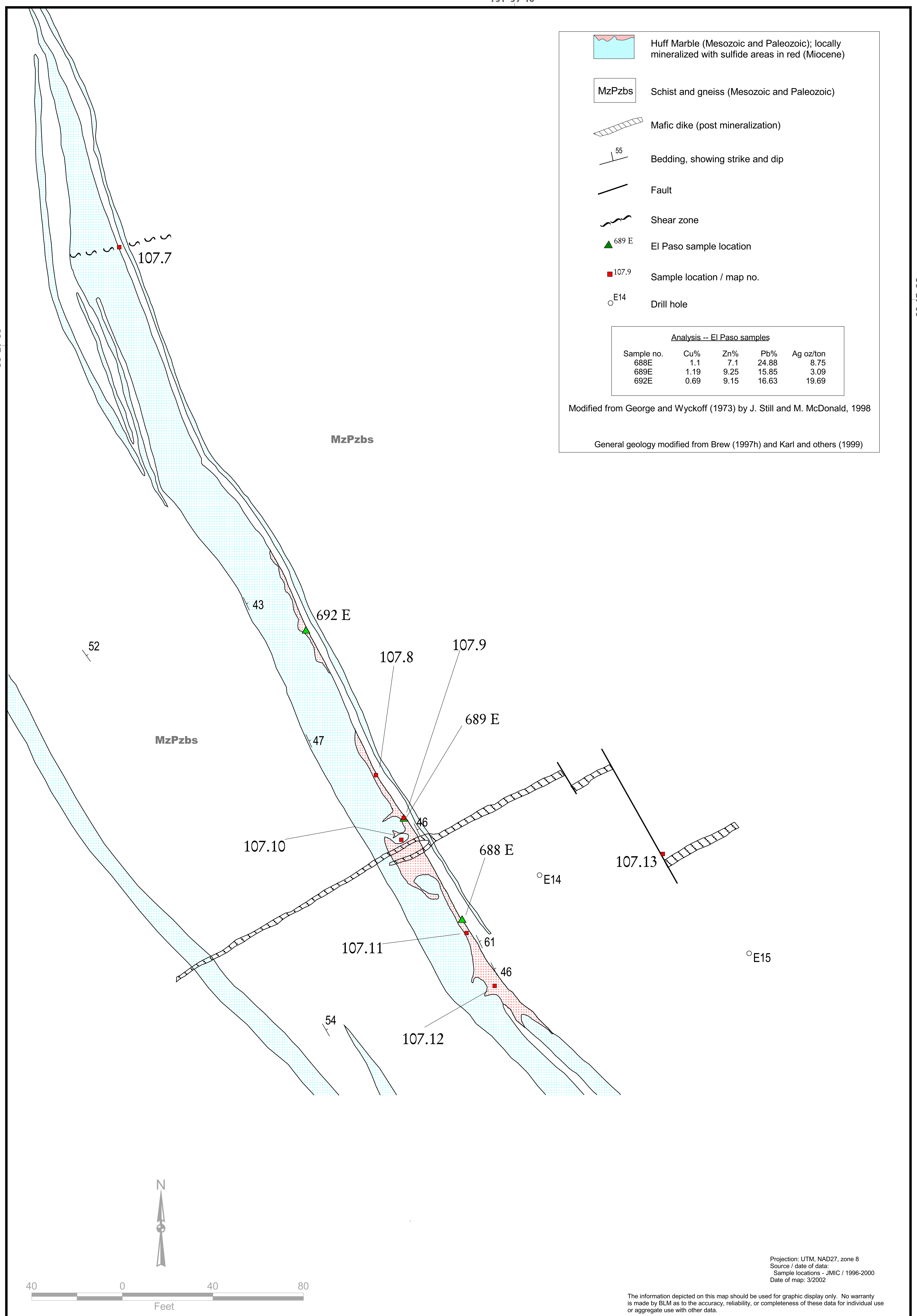

Figure 32. Map of the Huff prospect.

Glacier Basin

(Plate 3, Map no. 108)

MAS no.:	0021170020	*Quadrangle:*	Petersburg B1
Deposit Type:	PR, PV: Zn, Pb	*Latitude:*	56.5147
Land Status:	Open Federal	*Longitude:*	-132.0621
Development:	2 Adits	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Glacier Basin prospect is at the southeastern end of the Groundhog Basin area, approximately 13 miles east of Wrangell. The area consists of a flat-bottomed valley trending east-northeast with steep slopes rising to the south. To the northwest, progressively steeper slopes rise from the valley floor (at 2,000 feet) to the summit of Marsha Peak (at 4,525 feet) over a distance of approximately 1 mile. Thick brush predominates at the lower elevations with bare rock higher up. Avalanche snow accumulates in the gullies and on the floor of the valley until mid-season. Access to the prospect is via helicopter, with landing sites on the valley floor.

History

The Glacier Basin prospect was discovered in 1898 (Roppel, 1987). The area was prospected with three adits and numerous pits and cuts between 1898 and 1943. In 1943 the USGS mapped the area and crudely estimated resources (Gault and others, 1953). In 1963 the Bureau of Mines examined the Glacier Basin area and discovered that trace amounts of tin are associated with granulite and beryllium is associated with quartz-fluorite breccia veins in the area (Berryhill, 1964).

During 1964 and 1965, claims were staked covering most of the mineralized rock in the Groundhog Basin area including Glacier Basin. In 1965 the Bunker Hill Mining Co. optioned the property, but dropped it the same year (Bunker Hill Company, 1965). Between 1968 and 1981, Humble Oil and Refining Co., El Paso Natural Gas Co., and AMAX Exploration Co. optioned the area. These companies concentrated their mapping, sampling, and drilling to the north and east of Glacier Basin and did little or no work in the basin itself (Humble Oil and Refining Company, 1970b; George and Wyckoff, 1973; Hamilton, 1982a).

Mineral Assessment

The Groundhog Basin area consists of a belt of metamorphosed Paleozoic sediments and volcanics about 1½ miles wide that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). On the northern side of Groundhog Basin, a 16.3-million-year-old biotite granite stock intrudes the metamorphic rocks. Studies by Newberry and Brew (1989) indicate that the biotite granite stock is a zinnwaldite "tin" granite and that several base metal deposits in the area are related to this tin granite. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). The Glacier Basin prospect is situated in the western part of the belt, in the area with numerous rhyolite sills.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. In Glacier Basin, both bedding plane and crosscutting shears are occupied by quartz-fluorite veins with small amounts of galena, sphalerite, and more rarely beryllium.

Galena and sphalerite replace pyroxene granulite in the metamorphic belt of rocks in the Glacier Basin area. These sulfide zones are tabular, follow the original bedding in the rocks, and have been termed "ore beds" by Gault and others (1953). For clarity with past researchers the term "ore beds" is preserved herein.

The four ore beds that have been delineated in Glacier Basin are similar to those in Groundhog Basin. Each of the four ore beds has an adjacent gully, which is used to show its general location. They are confined to the north side of the basin and are found below 3,000 feet in elevation. The ore beds are separated by 200 to 1,000 feet of rhyolite sills, schist, and gneiss. They range in thickness from 0.3 to 20 feet and extend up to 2,000 feet along strike. They strike north-northwesterly and dip 50° to 60° to the northeast. The ore beds consist of granulite replaced by disseminations, pods, and discontinuous bands of sulfides. The sulfides are pyrrhotite, pyrite, sphalerite, and galena with a gangue of quartz, feldspar, hornblende, pyroxene, apatite, magnetite, and garnet. Trace amounts of cassiterite are also found in the ore beds (Berryhill, 1964). The USGS inferred a resource in the area of many hundreds of thousands of tons of pyroxene granulite that average 1.66 percent zinc and 1.09 percent lead (Gault and others, 1953).

USGS studies indicate that quartz-fluorite breccia veins are found on the northwest side of Glacier Basin, along both crosscutting and bedding plane shears. The veins pinch and swell, range in thickness from a few inches to 30 feet, and contain vugs of quartz and fluorite. Sulfides in the veins include disseminated galena, sphalerite, pyrrhotite, pyrite, and chalcopyrite. The gangue minerals are quartz, fluorite, and the silicate minerals of the metamorphic rocks (Gault and others, 1953).

The USGS estimates that at least six veins in Glacier Basin have a minimum thickness of 3 feet and a minimum strike length of 600 feet. An additional six veins are 5 feet or more thick and extend at least 1,000 feet along strike. These 12 veins were estimated to contain over 1,000,000 tons grading 0.14 percent zinc and 0.09 percent lead (Gault and others, 1953).

The Bureau of Mines' examination of quartz-fluorite breccia veins in Glacier Basin found that five contain beryllium. The veins are widely separated and were located by personnel using a beryllium meter on the northwest side of the basin at an elevation of 3,000 feet. The beryllium occurs as amorphous ½-inch blebs of pale blue beryl or as creamy white beryl, with an average grade of 0.1 percent beryllium oxide (Berryhill, 1964).

The BLM's examination of the Glacier Basin prospect was confined to the Gully Number 4 ore bed in the vicinity of two adits at elevations of 2,285 feet and 2,253 feet; the area between elevations of 3,500 feet to 4,000 feet on the north side of Glacier Basin; and a brief reconnaissance on the south side of Glacier Basin. At the time of the examination, the portal of the lower adit was covered with snow. The upper adit in the Gully Number 4 ore bed is 40 feet long. Small areas of disseminated and massive sulfides are located in a silicified zone at the contact between a quartz rhyolite sill and gneiss just above the adit. Select samples collected of the best mineralized rock contained from 3.97 to 7.98 oz/t silver, 4.64 to 33.4 percent lead, and 4.32 to 7.9 percent zinc (map no. 108.7, samples 2608, 2609). The samples above 3,500 feet elevation were taken of quartz fluorite veins with small amounts of disseminated sulfides. They contained up to 611 ppb gold, 1,378 lead, and 2,061 ppm zinc (map nos. 108.1-108.6, samples 1000-02, 9746-48). On the south side of Glacier Basin significant sulfide mineralization was not found. Samples were collected from pyrite-bearing iron-stained gneiss, but these did not contain significant metal values.

Conclusions

The Glacier Basin ore bed and vein deposits, as they are currently understood, are too low-grade to be considered an attractive exploration target. The discovery of beryllium by the Bureau of Mines in 1963 added interest to the area, but did not result in the discovery of mineralization of economic interest.

LAKE

(Plate 1, Map no. 109)

MAS no.:	0021170019	*Quadrangle:*	Petersburg B1
Deposit Type:	PV: Pb, Zn, Cu, Ag	*Latitude:*	56.5031
Land Status:	Open Federal	*Longitude:*	-132.0530
Development:	2 Adits , pits cuts	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Lake prospect is southwest of the Groundhog Basin area, approximately 11 miles east of Wrangell. The prospect workings are between 1,420 and 1,550 feet in elevation along the steep, northwestern flank of the ridge separating Porterfield Creek from Glacier Creek, 2 miles east of Virginia Lake. The terrain is heavily timbered and very steep. Access is via helicopter to a muskeg directly above the prospect at an elevation of 2,030 feet and then by foot down to the workings. Historically, access to this property was via a route that led first by trail from tide water at Eastern Passage inland, across Virginia Lake by boat, and again by trail along Porterfield Creek for approximately two miles. The trail subsequently led from the creek up the steep slopes of the ridge to the northern end of the property.

History

The Lake prospect was first staked as the Margery claims and was described as having a 40-foot adit in 1905 (Wright and Wright, 1905) and several opencuts and short tunnels by 1908 (Wright and Wright, 1908). Unpublished field notes taken by Buddington in 1921 report that 1 ton of ore was shipped from the Lake deposit (Gault and Flint, 1953). In 1924 the prospect was the only one in the area being actively developed (Buddington, 1926). It was under the control of the Virginia Lake Mining Co. as early as 1925, when the claims were restaked as the Lake group (Alaska Kardex, 117-028). Under this ownership, development of the underground workings continued at least until 1927 (Smith, 1930a; 1930b) and probably later. The prospect was examined and mapped by the USGS in 1943 (Gault and Flint, 1953). A claim post found during the BLM's examination of the prospect contained a staking notice dated 1965 posted by K. Eichner, A. Lillie, and W. Huff. In 1978 the Pacific Coast Molybdenum Co., a subsidiary of U.S. Borax and Chemical Corporation, restaked the prospect as the Port claims. The claims were dropped in 1986 (Alaska Kardex, 117-028; Bureau of Land Management, ALIS).

Mineral Assessment

A recent regional-scale map compilation describes the area of the Lake prospect as Cretaceous intrusives (Brew, 1997c). However, more detailed mapping done by the USGS prior to 1953 describes a package of metamorphic rocks including phyllite, schist, slate, and quartzite exposed in the workings of the prospect. These metamorphic rocks are inferred to be in contact with a unit of quartz diorite approximately 1,500 to 2,000 feet to the east of the workings (Gault and Flint, 1953). Mineralized rock at the prospect is found along a fault zone that strikes 025° to 035° and dips 70° to 90° to the southeast. Examination during this study indicates the fault zone is up to 5 feet wide; however, it is reported as up to 12 feet wide in some locations (Gault and Flint, 1953). It has been exposed by 3 adits, numerous trenches, and surface stripping over a strike length of approximately 1,450 feet. The fault contains quartz breccia and, locally, seams of fault gouge up to 1 foot thick. Intruding the fault zone is a narrow mafic sill that does not appear to be related to the mineralization. Mineralized rock is predominantly enriched with galena, with lesser amounts of sphalerite, pyrite, and minor chalcopyrite. The sulfides occur in the quartz breccia that fills the fault zone and also as distinct massive bands up to 0.5 feet wide, as pods, and as veinlets, all within the fault zone. The zone is open along strike and at depth. One of the adits shows the fault to continue at least to a depth of 60 feet down dip.

Adit 1, as described by Gault and Flint (1953), is the southernmost adit at an elevation of 1,425 feet. The back of this 20-foot, L-shaped adit has caved onto the floor, but access is still possible. A select sample across a narrow vein of galena and sphalerite outside the portal, contained 161 ppm silver, 8.54 percent lead, and 2.10 percent zinc (map no. 109.1, sample 376).

Adit 2, as described by Gault and Flint (1953), is located approximately 110 feet southwest of Adit 1, at an elevation of 1,420 feet. This T-shaped adit consists of a 100-foot crosscut and a 135-foot drift. The fault zone is exposed along the entire length of the drift. A 3.0-foot sample across the fault zone in the north face of the drift contained only traces of silver, lead, and zinc (map no. 109.1, sample 9695). A sample across the fault zone in the south face of the drift ran 10.3 ppm silver, 1,058 ppm lead, and 1.30 percent zinc across 4.6 feet (map no. 109.1, sample 9694). A high-grade dump sample contained 4.73 oz/t silver, 10.50 percent lead, and 6.60 percent zinc (map no. 109.1, sample 2613).

Adit 3 is located 350 feet southwest of Adit 2 at an elevation of 1,550 feet (Gault and Flint, 1953). Adit 3 was reported to be caved as early as 1943 and was not visited during this study.

In addition to the three adits, numerous surface trenches and pits have been dug along the fault zone. BLM personnel took two samples in a trench that exposes the surface trace of the fault zone above the drift in Adit 2. One contained 195 ppm silver, 2,049 ppm copper, 7.89 percent lead, and 5.70 percent zinc across 0.5 feet of quartz breccia in the fault zone (map no. 109.1, sample 377). The other was taken across a high-grade vein of massive galena and sphalerite 0.25 feet wide. It contained 411 ppm silver, 3,266 ppm copper, 25.10 percent lead, and 3.60 percent zinc (map no. 109.1, sample 378). A grab sample from a trench dump, just uphill from Adit 3, contained 178 ppm silver, 13.21 percent lead, and 16.4 percent zinc (map no. 109.1, sample 380).

Conclusions

The Lake prospect is 2 miles southwest of the contact between granodiorite and metamorphic rocks that form the western boundary of the Groundhog Basin area. Host rocks, base metal mineralization, and shear zone orientation at the Lake prospect are similar to many of the Groundhog Basin deposits, which suggests a relationship may exist between the ore-forming processes at both locations.

The mineralization at the Lake prospect is contained within a persistent, predictable fault zone that has been traced for over 1,450 feet. However, the base metal values are highly variable, and they occur only within a narrow part of the fault zone. As it is now understood, the mineralization at the Lake prospect is too narrow and low-grade to be of exploration interest, but the fault zone and the area in general still hold the potential for hosting higher-grade or more extensive mineralized zones.

BERG BASIN

(Plate 1, Map no. 110)

MAS no.:	0021170021	*Quadrangle:*	Petersburg B1
Deposit Type:	PV: Au?, Ag, Pb	*Latitude:*	56.4469
Land Status:	Open Federal	*Longitude:*	-132.0100
Development:	Adit, 2 DDH, pits	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Berg Basin prospect is at the southeastern end of the Groundhog Basin area, approximately 14 miles east of Wrangell. The prospect is on the east wall of a steep-sided gulch that drains from the northern side of Berg basin. An adit portal on the property is located at an elevation of 1,780 feet at the top of a steep talus slope and a short cliff. Access to the prospect is difficult. Early in the season, the area may be covered with heavy snow packs, but helicopter landing sites are available. Late in the season, the area is choked with brush, and helicopter landing sites are hard to find.

History

The Berg Basin prospect was discovered in 1907. By 1947 it was explored by an 840-foot adit and several surface pits. During 1947 and 1948, two diamond drill holes, totaling 742 feet, explored the prospect (Ray, 1953). The claims are not currently active.

Mineral Assessment

The Berg Basin prospect is in the same belt of metamorphosed Paleozoic sediments and volcanics that hosts the Groundhog Basin area deposits. The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. Basaltic and rhyolitic sills and dikes intrude along both trends. The sills predominate. At the Berg Basin prospect, sulfide mineralization is found within the basalt dikes and along the contacts of the basalt dikes with rhyolite, schist, and gneiss (Ray, 1953).

In 1923 Buddington reported that the Berg prospect consists of a 1-foot-thick quartz vein carrying moderate amounts of gold and silver hosted in a 12-foot-thick rhyolite sill. The sill is fractured with a network of narrow quartz veinlets containing pyrite, galena, and sphalerite. A 400-foot-long adit was driven to intersect the vein at depth (Buddington, 1923).

In 1947 Ray, of the USGS, mapped and sampled the prospect. He reported galena-sphalerite mineralization in lenses and pods within basalt dikes and along their contacts. Two samples, collected from blocks of galena from a discovery pit on the property, contained 29.9 and 28.7 oz/t silver. Other analyses from these samples were not reported. Ray also writes that the 1-foot-thick quartz vein on the property is reported to contain $14 per ton in gold (0.4 oz/t). The 840-foot adit was driven to intersect the vein and the galena-sphalerite mineralization at a depth of 170 feet below its surface exposure. Two diamond drill holes with lengths of 180 and 540 feet were collared within the adit. Neither the gold-bearing quartz vein nor the galena-sphalerite mineralization were found in the adit or drill holes (Ray, 1953).

The BLM's examination of the Berg Basin prospect was confined to the bottom of a gulch below the adit. There was no sign of past activity in the area. In the creek, investigators found a single 0.4-foot-thick piece of quartz float, with blebs of sphalerite, galena, and pyrite. Analysis of quartz indicated 10 ppb gold, 75 ppm silver, 2.12 percent lead, 4.97 percent zinc, and 1,060 ppm arsenic (map no. 110.1, sample 2644). While leaving the area by helicopter, BLM personnel spotted the adit portal at the top of a steep talus slope in the face of a cliff.

Conclusions

Little is known about the grades of the Berg Basin base metal and gold occurrence. Apparently a lot of exploration was accomplished on the property based only on a gold analysis from one vein. However the combination of reported gold and the base metals found during this study is sufficient to attract possible mineral exploration.

COPPER KING

(Plate 1, Map no. 111)

MAS no.:	0021180014	*Quadrangle:*	Bradfield Canal B6
Deposit Type:	PV: Zn, Cu, Ag	*Latitude:*	56.5046
Land Status:	Open Federal	*Longitude:*	-132.0486
Development:	1 Shaft, trench	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Copper King prospect is at the southeast end of the Groundhog Basin area, 16 miles east of Wrangell. It sits at an elevation of 1,300 feet, near a steep-sided creek that drains into Aaron creek. The area is covered with timber and brush. Access to the prospect is via helicopter to a landing site in a muskeg at an elevation of 1,500 feet.

History

The Copper King prospect was staked in 1906 and restaked in 1951 (Berg, 1967). It was developed by a 9-foot-deep shaft and cuts. During 1956 it was examined by James A. Williams of the Alaska Territorial Department of Mines (Williams, 1957). The claims are currently inactive.

Mineral Assessment

The Copper King prospect is located in the same belt of metamorphosed Paleozoic sediments and volcanics that hosts the Groundhog Basin deposits. The belt is about 1½ miles wide, strikes approximately 330°, and dips approximately 50° to the northeast. The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss (George and Wyckoff, 1973).

Studies by El Paso Natural Gas Co. indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. At the Copper King prospect, a quartz-sulfide mineralized zone is found within a rhyolite sill (Williams, 1957).

Examination of the Copper King prospect by Williams in 1956 revealed a 4.5-foot-thick quartz sulfide vein that strikes north-northwesterly and dips 80° to the east. The vein is exposed in the creek and by cuts on both sides for a distance of 45 feet. A 9-foot-deep shaft collared on the vein is located on the southeastern side of the creek. The shaft was flooded in 1956. Up dip, the vein grades into rhyolite. Down dip, the vein contains more quartz and sulfides. A sample collected from the upper part of the vein contained 0.15 percent zinc, whereas a sample collected from the shaft's dump contained 3.33 percent zinc and a trace of copper (Williams, 1957).

The BLM's examination of the Copper King prospect revealed the remains of an old cabin on the southeast side of the creek. Up the creek from the cabin, at an elevation of 1,320 feet, a flooded shaft was found on the southeast side of the creek. At this location a banded, quartz-sulfide mineralized zone that strikes north-northwest and dips steeply is exposed in the creek. It is hosted in rhyolite. A trench, now sloughed, extends for a distance of approximately 30 feet from the northwest side of the creek in a north-northwest direction along the trend of the mineralized zone. Overburden conceals outcrop between the creek and the flooded shaft, which is on the southeastern side of the creek, opposite the trench. The quartz-sulfide mineralized zone is partly exposed for a distance of 4 feet along strike in the creek and contains sphalerite, chalcopyrite, and pyrite. A 0.7-foot sample across the most mineralized part of the zone exposed in the creek contained 18.9 ppm silver, 5,639 ppm copper, and 2.1 percent zinc (map no. 111.1, sample 374). A shaft dump sample contained 12 ppm silver, 4,694 ppm copper, and 1.9 percent zinc (map no. 111.1, sample 375).

A quartz vein is exposed in the creek on the Copper King prospect at an elevation of 1,200 feet, approximately 750 feet southwest of the shaft. The 1.6-foot-thick, northeast-striking, steeply dipping quartz vein contained 679 ppb gold (map no. 111.1, sample 372).

Conclusions

As it in now understood, the Copper King occurrence is too low-grade and too narrow to be an attractive exploration target.

BERG
(Plate 1, Map no. 112)

MAS no.:	0021180068	*Quadrangle:*	Bradfield Canal B6
Deposit Type:	Unknown: Au?	*Latitude:*	56.3889
Land Status:	Open Federal	*Longitude:*	-131.9571
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access
The Berg claims are located on the north side of Berg Bay, near Berg and Aaron creeks, 18 miles southeast of Wrangell (Alaska Kardex, 118-004). The area topography is moderately steep, with thick timber and brush cover. Access to the prospect is by boat and foot.

History
Lester Berg held lode gold claims at the mouth of Aaron Creek as early as 1907. He had a camp in the area at the time, and that is when the gold claims are assumed to have been staked (Alaska Kardex, 118-004). The authors have found no other mention of these claims in published literature. There are currently no active claims in the area.

Mineral Assessment
The Berg claims are located in the same belt of metamorphosed Paleozoic sediments and volcanics that hosts the Groundhog basin area deposits (Brew, 1997c; Brew and Koch, 1997).

The BLM's investigation of the Berg claims area was confined to sampling stream sediment and quartz float in a stream that flows across the reported claim location (map no 112.1, samples 73, 241). The samples did not contain significant metal values.

Conclusions
The Berg prospect seems to be of little significance. There is no mention of it in published literature, and there has been no subsequent mineral exploration activity either at the reported claim site or in the general vicinity. The reported claim location is too vague to recommend further follow-up.

CONE MOUNTAIN

(Plate 1, Map no. 113)

MAS no.:	0021180070	*Quadrangle:*	Bradfield Canal C6
Deposit Type	Unknown: U_30_8, REE	*Latitude:*	56.4394
Land Status:	Open Federal	*Longitude:*	-131.9653
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low
Alternate name:	Pat		

Location/Access

The Cone Mountain area is in the vicinity of Black Crag Peak and Cone Mountain, 27 miles east of Wrangell. The area topography is rugged alpine with cliffs, sharp peaks, glaciers, and ice falls. Elevations in the area range from 1,400 to over 5,000 feet. Access to the prospect is by helicopter. There is overlap between the Black Crag prospect and the Cone Mountain REE anomalous area.

History

The Cone Mountain vicinity is described as an area containing rare-earth elements, uranium, lead, and zinc anomalies (Elliott and Koch, 1981). Brew describes the area as having associated silver, beryllium, molybdenum, nobelium, lead, tin, yttrium, and rare-earth element anomalies (Brew,1991). In 1976 Pacific Coastal Mines staked the 145 Pat lode claims in the area for radioactives (Alaska Kardex, 118-091).

Mineral Assessment

The Cone Mountain area consists of a Miocene alkali-feldspar granite stock with associated quartz-porphyritic rhyolite dikes in contact with Eocene granodiorite to the south and Tertiary or Cretaceous leucocratic quartz monzonite to the north (Elliott and Koch, 1981).

BLM personnel conducted scintillometer surveys at two locations on the ridge between Cone Mountain and Black Crag Peak at elevations between 4,500 and 5,000 feet and at the snout of a small glacier on the east side of Black Crag Peak at an elevation between 3,400 and 3,500 feet. Samples of granite were collected at each location where readings were above twice background (map nos. 113.1-113.3, samples 621-623). Analyses indicated values up to 140 ppm cerium, 75 ppm lanthanum, 48 ppm neodymium, and 66.9 ppm thorium.

Eight additional samples collected in the Cone Mountain-Black Crag area were run for rare-earth elements. They include samples from the Black Crag prospect (map no. 114.2, samples 624, 625, 649-651, 8860, 8861, 8871). The samples were collected from a variety of felsic volcanic and intrusive rocks. The highest values were from molybdenum-bearing, rhyolite breccia float that contained 1,740 ppm cerium, 954 ppm lanthanum, 440 ppm neodymium, 60 ppm samarium, 72.6 ppm thorium, and 2,098 ppm molybdenum (map no-114.2, sample 8861).

Conclusions

Rare-earth element and uranium mineralization is reported from the Cone Mountain area and the alkali-feldspar granite stock is favorable for such. A brief BLM investigation in the area located indications of this mineralization. Much of the area is rugged and would require experienced mountaineers to traverse.

BLACK CRAG

(Plate 1, Map no. 114)

MAS no.:	0021180147	*Quadrangle:*	Bradfield Canal C6
Deposit Type:	Porphyry: Mo, REE	*Latitude:*	56.5463
Land Status:	Open Federal	*Longitude:*	-131.6774
Development:	DDH?	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Medium

Location/Access

The Black Crag prospect is in a U-shaped valley 1 mile southeast of Black Crag Peak, 27 miles east of Wrangell. The area topography is rugged alpine with cliffs, sharp peaks, glaciers, and ice falls on either side of the valley. Elevations in the area range from 1,400 to 5,000 feet. Access to the prospect is by helicopter. There is overlap between the Black Crag molybdenum prospect and the Cone Mountain rare earth elements (REE) anomalous area.

History

The Black Crag prospect and vicinity is not mentioned in published literature. However, a prospector reports drilling for molybdenum in the Black Crag vicinity during the 1950's (P. Pieper, oral commun., 1998). Several old, weathered posts, possibly claim posts, were found in the area during this study and may indicate past activity.

Mineral Assessment

The Black Crag prospect is near the contact between a Miocene alkali-feldspar granite stock with associated quartz-porphyritic rhyolite dikes and flows and Mesozoic and Paleozoic metasedimentary and metavolcanic rocks (Elliott and Koch, 1981).

A brief examination of the area during this study revealed copper- and molybdenum-bearing float on the east side of the valley at elevations between 1,400 and 2,300 feet. The float consists of quartz porphyritic rhyolite with molybdenum coatings along fractures; fine-grained, silicified felsite with a 0.01-foot-thick seam of molybdenum; and silicified, iron-stained intrusive with pyrite and chalcopyrite. Grab samples from the molybdenum-bearing rocks contained 735 and 1,348 ppm molybdenum (map no. 114.2, samples 476, 480). The chalcopyrite-bearing rock contained 1,508 ppm copper (map no. 114.2, sample 8733). The float probably originated from cliffs of intrusive and volcanic rock on the southeast side of the valley (photo 31). In the valley floor, at an elevation of 2,400 feet, a 0.3-foot-thick, iron-stained, silicified breccia cobble with a pyrrhotite matrix contained 93 ppb gold, 43.5 ppm silver, and 558 ppm zinc (map no. 114.1, sample 466).

A helicopter landing spot was located on the south side of the valley at an elevation of 3,200 feet below a 1-mile-wide hanging glacier. Between elevations of 3,200 and 3,400 feet, volcanic float with molybdenum fracture coatings was found to be abundant. Samples from this float contained from 23 to 2,529 ppm molybdenum and from 119 to 713 ppm zinc. These samples were also run for REE and related elements. They contained up to 1,740 ppm cerium, 954 ppm lanthanum, 440 ppm neodymium, 60 ppm samarium, 72.6 ppm thorium, and 16 ppm uranium (map no.114.2, samples 624, 625, 8860, 8861).

Conclusions

The Black Crag prospect has indications of copper, molybdenum, silver, and REE mineralization. The vicinity is worthy of more detailed examination.

Photo 31. The Black Crag prospect showing the north side of a U-shaped valley below a mile wide hanging glacier. Rock fragments found below the glacier contained molybdenite. Photo by J. Still.

CRAIG RIVER

(Plate 1, Map no. 115)

MAS no.:	0021180141	*Quadrangle:*	Bradfield Canal B5
Deposit Type:	Skarn: Cu, Mo	*Latitude:*	56.4641
Land Status:	Open Federal	*Longitude:*	-131.3557
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Craig River area is near the U.S.-Canada border, approximately 7 miles west of Mt. Pounder, a border peak near the head of the North Fork of the Bradfield River. The area is 40 miles east of Wrangell. The occurrence lies at approximately 3,100 feet elevation in a north-facing, glaciated cirque, south of the head of the Craig River. The general area is marked by rugged mountains with much of the area above tree line. Access is by helicopter.

History

There is no known published reference to the occurrence in the Craig River area. As part of the Alaska Mineral Resources Program, USGS sampling in the late 1970's revealed anomalous values of silver, gold, copper, and zinc in the upper Craig River area (Koch, 1997). During the current study, BLM personnel were directed to the immediate area by a helicopter pilot who had flown mineral industry geologists to the site in the 1990's.

Mineral Assessment

The occurrence in the Craig River area consists of skarn minerals with associated sulfides that are hosted in marble. Rocks in the area are mapped as Mesozoic or Paleozoic metasedimentary and lesser metavolcanic rocks with local marble. Two Eocene intrusive bodies are also mapped in the area. One is granodiorite and quartz diorite; the other is quartz monzonite and granodiorite (Elliot and Koch, 1981).

Rock units in the Craig River area trend toward the northeast and dip moderately to the southeast. A banded marble layer that is associated with the skarn is approximately 300 feet thick. It is structurally underlain by a layer of dark gray to dark green, well-foliated metasediments, approximately 500 feet thick, which in turn are in contact with a quartz monzonite and granodiorite. Structurally overlying the marble is another layer of metasediments. Based on mapped units, the expected contact between the marble and the intrusive is covered by an ice field to the southwest of the cirque skarn occurrences.

The 300-foot-thick layer of marble in the Craig River area is medium- to coarse-grained, commonly white, with bands of interlayered schist and quartzite that show evidence of intense deformation. Skarn minerals are mainly garnet and epidote with patches and seams of massive pyrite, pyrrhotite, and minor chalcopyrite. Gossan is common where the sulfides associated with the skarn have been oxidized. Patches of skarn minerals with sulfides are small–on the scale of several feet–and isolated.

BLM personnel collected four samples in the Craig River area; three of them were of skarn-related sulfides and associated gossan (map no. 115.1, samples 3736, 3746, 3747). One select sample contained 1,781 ppm copper (map no. 115.1, sample 3747) and another contained 478 ppm molybdenum (map no. 115.1, sample 3736). Neither of these samples represent significant lengths of mineralization. Precious metal values from the samples were low; the highest gold value was 41 ppb across 2.2 feet of gossan (map no. 115.1, sample 3746).

Conclusions

The skarn occurrence, as currently exposed in the Craig River area, is very small and low-grade. The immediate contact between the mineralized marble layer and the quartz monzonite and granodiorite, with which the mineralization is likely associated, was not discovered, however. The contact is likely covered by ice sheets in the area. Based on the evidence gathered to date, the occurrence is of little significance.

CRAIG CLAIMS

(Plate 1, Map no. 116)

MAS no.:	0021180143	*Quadrangle:*	Bradfield Canal B4
Deposit Type:	Skarn: Cu, Zn	*Latitude:*	56.4526
Land Status:	Open Federal	*Longitude:*	-131.2372
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*	Low

Location/Access

The Craig Claims area is near the U.S.-Canada border, 2.5 miles west of Mt. Pounder, a border peak near the head of the North Fork of the Bradfield River. The area is 45 miles east of Wrangell. The occurrence is reported to lie a few hundred feet below the foot of an ice field, at approximately 4,000 feet elevation (Grybeck and Berg, 1998). The area is marked by rugged mountains with sparse vegetation. Access is by helicopter.

History

Sixty claims, called the "Craig" claims, were staked by K. Eichner, W. Huff, W. Hawkins, and A. Lillie in 1977 (Alaska Kardex, 118-092). By 1981 the claims were no longer active (Elliot and Koch, 1981). There is no known report of activity since the original claims were staked.

Mineral Assessment

Elliot and Koch (1981) reported disseminated chalcopyrite, pyrite, and pyrrhotite in metasedimentary rock and chalcopyrite in thin veinlets. Float with skarn minerals including magnetite and minor chalcopyrite is also reported. The host rocks in the area have been mapped as Mesozoic or Paleozoic metasedimentary and lesser metavolcanic rocks with local marble (Elliot and Koch, 1981).

BLM personnel examined the Craig Claims area, but were unable to locate the occurrence in outcrop. Instead, they sampled rubble from talus slopes that was similar to the mineralized rock described by Elliot and Koch (1981). BLM personnel collected seven samples in the Craig Claims area. Four of the samples were collected from rubblecrops at the foot of steep cliffs in the vicinity of the reported occurrence. Two types of mineralization are evident–disseminated and layered sulfides in schist and gneiss, and skarn. A sample of hornblendite, which was likely formed as a skarn, contained approximately 25 percent sulfides, mostly pyrite and pyrrhotite, with 5,706 ppm copper and 3.1 percent zinc (map no. 116.2, sample 3740). The skarn is more commonly evident as inch-scale seams of coarsely crystalline pyrite. The disseminated and layered sulfides consist mainly of pyrite. Sample results indicate low base metal values. The highest gold value from the area was only 30 ppb (map no. 116.2, sample 3740).

Investigators collected three samples from a ridge crest 0.7 miles west-southwest of the above described rubblecrops. Iron-stained, metasedimentary rocks and minor skarn were sampled from a roof pedant surrounded by quartz monzonite and granodiorite. The base and precious metal values of the samples were low. One skarn sample contained 1,277 ppm copper and 2,288 ppm zinc (map no. 116.1, sample 3741).

Conclusions

BLM personnel did not find significant mineralization in the Craig Claims area. The fact that the claims were held for less than 2 years also suggests that the occurrence is of limited significance.

NORTH BRADFIELD RIVER SKARN

(Figure 33, Map no. 117)

MAS no.:	0021180049	*Quadrangle:*	Bradfield Canal B5
Deposit Type:	Skarn: Fe, Cu	*Latitude:*	56.4928
Land Status:	Open Federal	*Longitude:*	-132.0431
Development:	DDH, trenches, adit?	*MDP:*	Low
BLM work:	Sampled	*MEP*	Medium

Location/Access

The North Bradfield River Skarn prospect is 15 miles up the North Fork of the Bradfield River, approximately 39 miles east of Wrangell. An old, partly washed-out logging road extends from the head of Bradfield Canal up the North Fork of the Bradfield River to the prospect. The area topography is rugged, ranging in elevation from 400 to 4,000 feet. The lower elevations are brush- and timber-covered; the upper elevations are alpine (photo 32). Access to the prospect is by helicopter.

History

Malachite-stained cliffs led pilot Ken Eichner to the discovery of the North Bradfield River Skarn iron-copper prospect in 1955. His partner, Paul Pieper, staked the area (Ken Eichner, oral commun., 1997), and by 1958 it was held with 41 claims (Alaska Kardex, 118-063). Vancouver geologist Clive Ball examined and mapped it in 1956 (Ball, 1956). In 1957 it was examined by consultants for Takahashi C.T. & Co. and optioned until December 31, 1959. Takahashi mapped the prospect, conducted an aeromagnetic survey, and drilled 14 shallow holes (Roberts, 1958). From 1960 to 1962, Utah Construction optioned the property, mapped and sampled it in detail, drilled out at least 460 feet of core, and estimated resources (Utah Construction, 1960; 1962). In 1960 the USGS mapped the prospect (MacKevett and Blake, 1963). An adit was driven in 1967, and the prospect was drilled in 1968 and 1970 (Alaska Kardex, 118-63). In 1977 approximately 400 stream sediment and rock chip samples were collected from the prospect (Nieman and Ellison, 1977). There are no active claims in the area.

Mineral Assessment

The North Bradfield River Skarn prospect is in the northwestern corner of a large, metamorphosed roof pedant within the Coast Range Batholith. The pedant is 2 miles wide in the area of the prospect. It consists of Mesozoic and Paleozoic metasedimentary and metavolcanic rocks that are altered to gneiss and schist and intercalated with beds of marble. The metamorphic rocks are in contact with Eocene quartz monzonite and are cut by felsic to intermediate dikes (Utah Construction, 1960; Elliott and Koch 1981). The iron-copper deposits are found in skarn zones associated with beds of marble. According to MacKevett and Blake (1963), the marble beds form an overturned syncline; as interpreted by Sonnevil (1981), they form a homocline with northwest to northeast dips. Work by Utah Construction (1960) tends to support the homoclinal interpretation.

The iron-copper deposits of the North Bradfield River Skarn form a discontinuous series of pods and lenticular bands striking northwest and dipping 30° northeast to vertical. They form a belt 0.5 mile wide by 2 miles long with an upper area of iron-copper deposits at elevations of 2,000 to 3,600 feet and a lower area of deposits at elevations from 700 to 900 feet (fig. 33). Locally the marble is replaced by calc-silicate skarn, which contains lenses and pods of magnetite with minor pyrrhotite, chalcopyrite, and pyrite (Utah Construction, 1960).

Based on trenching and drilling, Utah Construction has identified nine magnetite-copper lenses in the upper area that range in width from 15 to 150 feet, in length from 150 to 650 feet, and in depth from 100 to 500 feet. In the lower area, Utah Construction has identified four magnetite-copper lenses or zones that range in width from 15 to 20 feet, in length from 320 to 1,200 feet, and in depth from 150 to 400 feet.

It is estimated that the upper area deposits contain 500,000 tons of proven and probable resources and 3,542,000 tons of possible resources, and the lower area deposits contain 500,000 tons of proven and probable resources and 939,000 tons of possible resources. Taken together, the lower and upper areas contain 1,000,000 tons of proven and probable resources and 4,481,000 tons of possible resources. The grade is estimated to be 35 to 40 percent iron, 0.2 to 0.3 percent copper, and 3 to 4 percent sulfur (Utah Construction, 1960).

The BLM's examination of the North Bradfield River Skarn prospect was confined to (1) sampling rock exposures at elevations from 700 and 750 feet along the North Fork of the Bradfield River at the northern end of the prospect, (2) collecting stream sediment samples from the gully that drains the central area of the prospect, and (3) sampling magnetite-copper and associated mineralization in the lower (northwestern) and upper (southeastern) parts of the prospect. At the northern end of the prospect, samples collected from skarn mineralized zones found in iron-stained schist and gneiss (in cliffs on the east side of the North Fork of the Bradfield River) contained up to 164 ppb gold and 1.3 percent copper (map nos. 117.1-117.3, samples 455, 456, 473, 2860-61, 8726). Stream sediment samples from the stream draining the central part of the area did not contain significant metal values (map no. 117.6, samples 9749, 1009, 1010). In the lower part of the prospect, samples collected from magnetite and associated skarn mineralization contained up to 190 ppb gold, 6,629 ppm copper, and 168 ppm molybdenum (map nos. 117.4, 117.7-117.9, samples 471, 474, 475, 8725, 8727-29). In the upper part of the prospect, samples collected from magnetite and associated skarn mineralization contained up to 289 ppb gold, 3,351 ppm copper, and 283 ppm molybdenum (map nos. 117.10-117.18, samples 472, 481-484, 487, 488, 8735-38, 602-04, 8844, 8845). At an elevation of 3,000 feet in the upper part of the prospect, a trench exposes a copper-iron mineralized zone 37 feet wide. Samples across this zone average 0.2 percent copper (map no. 117.12-117.13, samples 602-603, 8844). In addition, two reconnaissance samples collected of magnetite, hematite, and quartz from the upper part of the prospect and analyzed by a different laboratory contained 1,360 and 3,600 ppb gold, 3.4 and 11.6 ppm silver, and 1,130 and 2,200 ppm copper (map no 117.19, 117.20, samples 2645, 2646).

The BLM's sample results for copper compare roughly with the Utah Construction resource estimates of 0.2 to 0.3 percent copper. The gold values in samples 2645 and 2646 are anomalously high when compared with the other samples collected from the same area and may be analytical artifacts.

Conclusions

The resource estimate for the North Bradfield River Skarn prospect indicates a copper-iron deposit that is too small and too low-grade to be a development target. Exploration at greater depth and in the vicinity of the known deposit may reveal more significant mineralized rock.

Photo 32. Geologist visiting an iron-stained skarn zone at the upper area of the North Bradfield River Skarn prospect. Photo by J. Still.

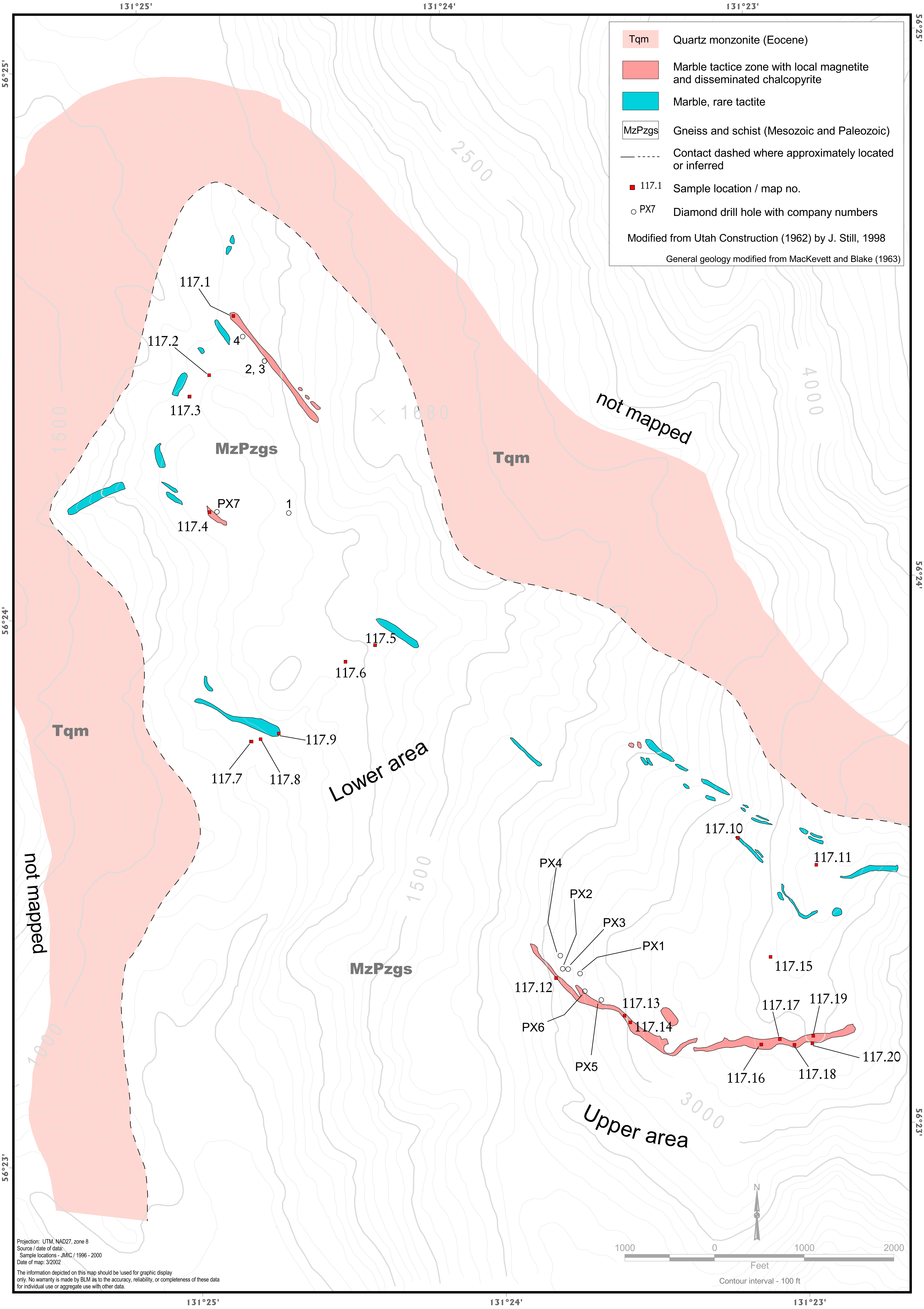

Figure 33. Map of the North Bradfield River Skarn prospect.

Mt. Lewis Cass

(Plate 1, Map no. 118)

MAS no.:	0021180144	*Quadrangle:*	Bradfield Canal B4
Deposit Type:	Porphry: Mo, Cu	*Latitude:*	56.2026
Land Status:	Open Federal	*Longitude:*	-131.6294
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Mt. Lewis Cass occurrence is 1½ miles southwest of Mt. Lewis Cass, 48 miles east of Wrangell. The area topography is alpine, with glaciers, sharp peaks, and steep-walled, U-shaped valleys. Elevations at the occurrence range from 2,400 to 4,100 feet. Access is by helicopter.

History

The Mt. Lewis Cass occurrence was discovered during this study. There is no mention of it in published literature.

Mineral Assessment

The Mt. Lewis Cass occurrence is near the contact between Eocene granodiorite and Mesozoic and/or Paleozoic metasedimentary and metavolcanic rocks with some marble (Elliot and Koch, 1981). The granodiorite is exposed in a stream cut located at the bottom of a U-shaped valley (elevation 2,500 feet). The southern side of the valley consist of iron-stained, volcanic and sedimentary rocks.

The granodiorite includes narrow quartz stringers that contain knots and blebs of sulfides. A 5-foot-long by 0.3-foot-thick quartz stringer contains blebs of molybdenum. A 0.3-foot chip sample across it assayed 1,240 ppm molybdenum (map no. 118.2, sample 8718). A sample from a molybdenum-bearing quartz stringer in a 25-foot-high granodiorite boulder contained 1,558 molybdenum (map no. R380, sample 8868). Other stringers examined did not contain metallic sulfides.

Iron-stained, silicified, metasedimentary and metavolcanic float, which is likely rubble from the cliffs on the southern side of the valley, contains pyrrhotite, magnetite, and chalcopyrite. The chalcopyrite is in blebs and narrow quartz stringers. Samples from the chalcopyrite-bearing float contain from 1,832 ppm to 1.33 percent copper, up to 289 ppb gold, and 17.6 ppm silver (map nos. 118.1, 118.2, samples 463, 8717).

BLM personnel examined an area of iron-stained, volcanic rocks exposed between elevations of 4,000 and 4,300 feet in a cliff on the southern side of the valley (photo 33). In places, these rocks are silicified, contain small amounts of pyrite and pyrrhotite, and are intensely iron-stained. Metallic sulfide minerals were not found (map no. 118.2, samples 470, 8723, 8724).

Conclusions
The Mt. Lewis Cass occurrence has indications of copper and molybdenum mineralization. The area is worthy of more detailed examination.

Photo 33. Mitch MacDonald, BLM geologist, examining the Mt. Lewis Cass area for molybdenum mineralization. Photo by J. Still.

UPPER MARTEN LAKE

(Plate 1, Map no. 119)

MAS no.:	0021180145	*Quadrangle:*	Bradfield Canal B6
Deposit Type:	PV: Au, Ag, Pb	*Latitude:*	56.2871
Land Status:	Open Federal	*Longitude:*	-131.7900
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*	Low

Location/Access

The Upper Marten Lake area is 25 miles southeast of Wrangell on the mainland. The occurrence is in the saddle of a ridge at an elevation of approximately 2,600 feet, about 1 mile east-southeast of the eastern end of Upper Marten Lake. The site is above the local tree line where the sparse vegetation includes brush and grasses. Access is best by helicopter.

History

The Upper Marten Lake area was brought to the attention of BLM personnel by a USGS stream sediment sample from the area that was anomalous for gold (Koch and Elliot, 1981). No other reference to the site is known.

Mineral Assessment

The Upper Marten Lake occurrence consists of mineralized rock associated with a fault zone that is oriented 330° and dips approximately 75° to the northeast. The fault zone forms a topographic low in which a stream now flows and from which an anomalous stream sediment sample was collected by the USGS (Koch and Elliot, 1981). The fault is hosted in rocks mapped as Mesozoic and/or Paleozoic schist and paragneiss and is near the contact with a Cretaceous diorite or granodiorite (Elliot and Koch, 1981). The occurrence is also about 2 miles west of the Coast Range megalineament (Brew and Ford, 1978) and great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and, in a general way, is aligned along strike with the mineralized rock of Groundhog Basin and the gold occurrence at Andrew Creek, 15 to 20 miles to the northwest.

Quartz stringers and veins are common in the fault zone along with clay-like fault gouge. In places the quartz and gouge contain sulfides, mainly pyrite and pyrrhotite.

BLM personnel collected four samples of iron-stained quartz and fault gouge from the fault zone at Upper Marten Lake. One sample contained 475 ppb gold, 86.9 ppm silver, and 1,218 ppm lead (map no. 119.1, sample 2847). The other samples had low precious and base metal values.

BLM personnel also collected one sample from an iron-stained quartz vein exposed along a ridge crest approximately 2 miles north of the Upper Marten Lake occurrence. The vein trends 335° and dips approximately 75° to the northeast. It is hosted in schist, and the vein and schist foliation are approximately conformable. The vein pinches and swells from approximately 3 inches to 1 foot in width. It is exposed for approximately 20 feet. It contains only minor pyrite.

Analytical results revealed 517 ppb gold across 0.7 feet of the vein (pl. 2, map no. R382, sample 3749).

Conclusions

The known mineralized rock at the Upper Marten Lake occurrence is insufficient in size and grade to be of significance by itself. The occurrence is noteworthy because of its similar relative position to the Coast Range megalineament and great tonalite sill as the mineralized rock at Groundhog Basin and Andrew Creek. If the similarity of position is related to genesis of the mineralized rock, the area may be considered more prospective for hosting mineral deposits than previously thought.

BRADFIELD CANAL SHEAR

(Plate 1, Map no. 120)

MAS no.:	0021180142	*Quadrangle:*	Bradfield Canal A5
Deposit Type:	PV: Au, Ag, Cu	*Latitude:*	56.2026
Land Status:	Open Federal	*Longitude:*	-131.6294
Development:	Cut	*MDP:*	Low
BLM work:	Sampled	*MEP:*	Low

Location/Access

The Bradfield Canal Shear prospect is on the north side of Bradfield Canal, 35 miles southeast of Wrangell. The opencut that exposes the occurrence is at an elevation of approximately 40 to 50 feet, on the west side of the second bite to the west of the mouth of the Harding River. The prospect is most easily accessed by boat to the bite on Bradfield Canal. Float plane access may be possible during favorable weather conditions. Helicopter access is also possible, but landing sites in the steep intertidal zone are difficult to find.

History

Several shear zones in the Bradfield Canal area were examined in 1942 by J.C. Roehm, a mining engineer with the Territorial Department of Mines. The Bradfield Canal Shears prospect referred to here is one of those described by Roehm (1942). Along with the other shear-hosted veins in the area, the occurrence described here was reportedly discovered by Carl Thysen and Jack Anderson (Roehm, 1942).

Mineral Assessment

Roehm (1942) describes the shear-hosted veins in the Bradfield Canal area as occurring in the broad contact zone between the Early to Middle Eocene Coast Mountains Batholith and the stratified rocks to the west. At the Bradfield Canal Shears prospect described here, the shear zone is said to be hosted between mica schist in the hanging wall and metamorphosed limestone in the footwall (Roehm, 1942). The occurrence lies adjacent to the Coast Range megalineament (Brew and Ford, 1978) and the Late Cretaceous to Early Eocene great tonalite sill belt (Brew and Morrell, 1983; Brew, 1994). The mineralization at the Bradfield Canal Shears prospect may be associated with these features.

BLM personnel sketched the open cut that exposes the quartz vein at the Bradfield Canal Shears and collected four samples. The milky white, crystalline quartz vein is generally 6 inches to 1 foot wide and has been exposed by the opencut for 20 feet. It strikes approximately 320° and dips steeply to the northeast. It is approximately parallel to foliation in the hosting quartz-feldspar schist or gneiss. Sulfides make up approximately 1 to 2 percent of the vein and consist predominantly of pyrrhotite with pyrite and chalcopyrite. The sulfides occur in patches and seams within the quartz.

Analytical results from samples cut across the quartz vein indicate low precious and base metal values. The highest values include 17 ppb gold, 1.8 ppm silver, and 197 ppm copper across 1.2 feet of the vein and adjacent gneiss (map no. 120.1, sample 3929) and 235 ppm zinc across 0.6 feet of quartz (map no. 120.1, sample 3930).

Conclusions

The Bradfield Canal Shears prospect on the north side of Bradfield Canal that the BLM investigated is of little economic significance. The vein is narrow and contains low metal values. Although exposures are limited, a BLM reconnaissance revealed no additional mineralized rock in the area. The area is unlikely to attract mineral exploration attention for shear-hosted, polymetallic veins that were examined at the prospect.

BRADFIELD RIVER

(Plate 1, Map no. 121)

MAS no.:	0021180073 & 0021180075	*Quadrangle:*	Bradfield Canal A5
Deposit Type:	Placer: Fe	*Latitude:*	56.2350
Land Status:	Open Federal	*Longitude:*	-131.4525
Development:	None	*MDP:*	Low
BLM work:	Sampled	*MEP*:	Low

Location/Access

The Bradfield River prospect is by the mouth of the Bradfield River near the head of Bradfield Canal, 37 miles southeast of Wrangell (Alaska Kardex, 118-087). The area topography is moderately steep with timber and brush cover. Access to the prospect is by boat and foot.

History

At the head of Bradfield Canal, 57 placer claims were staked for iron in 1962. Three placer claims were also staked for iron at the mouth of the Bradfield River in 1974 (Alaska Kardex, 118-075). There is no other mention of these placer claims in published literature. Currently, there are no active claims in the area.

Mineral Assessment

The tide and river flats at the head of Bradfield Canal and at the mouth of the Bradfield River include extensive sediments that contain wisps of magnetite-rich black sands. The source of the magnetite is likely the iron-rich North Bradfield River Skarn deposit and the intrusives of the Coast Range Batholith.

The BLM's examination of the head of the Bradfield Canal was confined to collecting 12 stream sediment samples from magnetite-bearing sands exposed in river and tide flats. The samples averaged 9 percent iron. The two highest-grade iron samples contained 20.34 and 54.89 percent iron (map no. 121.3, samples 70, 238). None of the samples contained other significant metal concentrations.

Conclusions

The Bradfield River prospect does not contain sufficient iron or other metals to be an exploration target.

SUMMARY: KNOWN MINERAL DEPOSIT AREAS

(Plate 1)

This study delineated the Duncan Canal, Groundhog-Berg Basin, and Cornwallis Peninsula areas as “known mineral deposit areas” or KMDA’s (pl. 1). These KMDA’s have a higher relative likelihood for hosting a significant mineral deposit than other parts of the Stikine area.

In 1991 the Forest Service completed its revision of the Tongass Land Management Plan. During the process Forest Service personnel, with the aid of information generated by previous Bureau of Mines work, delineated known mineral deposit areas (KMDA’s) in the Stikine area (USDA Forest Service, 1991). These were defined by a high concentration of prospects and favorable geology. Some parts of the Groundhog Basin-Berg Basin and the Duncan Canal KMDA's were delineated by the Tongass Land Management Plan. As a result of the current mineral assessment, the identification of additional prospects, mineral industry work, geophysical exploration, and the use of the most up-to-date geology, the Tongass Land Management Plan KMDA's are redefined and their boundaries expanded to form the two KMDA's shown on plate 1. The Cornwallis Peninsula area had been previously listed as an area with some potential for hosting vein and massive sulfide deposits by Berg (1984). Based on the identification of additional prospects and mineral industry data, it was determined that the Cornwallis Peninsula area is sufficiently mineralized to establish a KMDA (pl. 1).

Each KMDA description that follows has sections on location and access, history, geology, and a summary description of the most important prospects that make up the KMDA. A table listing other prospects in the KMDA along with their MEP rating is included in each discussion (tables 4-6). The “D” prefix prospects shown on plate 2 and described at the end of table A-1 are too poorly known, with regard to deposit type, and so are not included in the KMDA discussion.

A summary of the most important prospects outside the KMDA’s is included in the “Other Prospects of Note” section following the discussions of the KMDA’s. These include all the prospects with a medium MEP in the study area, outside the KMDA’s.

The prospects described in the KMDA discussions, along with the “Other Prospects of Note,” constitute a summary of the most significant prospects in the Stikine area.

CORNWALLIS PENINSULA KMDA

(Plate 1)

Location Access

The Cornwallis Peninsula KMDA covers most of the Cornwallis Peninsula on the northeast end of Kuiu Island, 5 to 13 miles south and east from the town of Kake on Kupreanof Island (pl. 1). Measuring 6 miles wide by 15 miles long, the KMDA is mostly surrounded by water. The topography is moderate, with elevations ranging from sea level to 929 feet. The area is covered with muskegs, brush, and timber. Access is by boat, float plane, or helicopter. The mineral rights to a large part of the Cornwallis Peninsula KMDA are managed by Sealaska Corporation (the area's Native regional corporation). Table 3 lists the prospects in the Cornwallis Peninsula KMDA and their map numbers; their locations are shown on plate 1.

History

The first recorded mineral activity in the Cornwallis Peninsula KMDA occurred in 1923 when Hungerford staked 3 claims at the Cornwallis Peninsula prospect (Buddington, 1925). As early as 1925, Buddington (1925) discussed mineralization at the Katherine and at the Keku Islet prospects.

In 1937 the Hungerford and Kuiu prospects were staked (Roehm, 1937; Thorne 1948). By 1948 exploration at the Kuiu prospect included an adit, winze, and cuts; and cuts at the Hungerford (Roehm, 1946a; Thorne, 1950a). In about 1946, 14 diamond drill holes were collared at the Kuiu prospect (Roehm, 1946a). In 1949 the Bureau of Mines collared 5 diamond drill holes at the Hungerford (Thorne, 1950b).

Between 1973 and 1974, Resource Associates of Alaska (RAA) staked 121 claims called the Corn group (Alaska Kardex, 116-035). The claims were leased to Cominco America in the mid-1970's, which then carried out detailed sampling, geophysical surveying, and a limited drilling program consisting of two or three diamond drill holes. Mapco, Inc. also leased the Corn claims from RAA sometime in the late 1970's and drilled at least one diamond drill hole in the area. RAA allowed the claims to lapse sometime in the 1980's (Hedderly-Smith, 1990). Between 1978 and 1979, Mapco, Inc. staked 108 claims in the Saginaw Bay area and drilled one hole (Bureau of Land Management, MAS).

Geology

From west to east the Cornwallis Peninsula KMDA consists of: (1) The Permian Halleck Formation consisting of silty limestone overlain by (2) the Permian Pybus Formation consisting of limestone unconformably overlain by (3) the Triassic Keku Volcanics consisting of felsic and mafic volcanics overlain by the (4) Triassic Cornwallis Limestone (Muffler, 1967).

Six of the nine prospects in the KMDA and the three most significant (map nos. 6, 8, and 10) are hosted in the Triassic Keku Volcanics. Muffler (1967) describes this unit as a sequence of felsic and mafic volcanic rocks with intercalated clastic rocks. It is dominantly felsic flow rock and flow breccia (Muffler, 1967).

Summary of Prospects

As they are understood today, the three most significant prospects in the KMDA are the Kuiu (map no. 6), Hungerford (map no. 8), and Skate Creek (map no.10). The Hungerford has a high MEP, whereas Kuiu and Skate Creek have medium MEP's. The mineral rights of the former two are controlled by Sealaska.

Table 3. Cornwallis Peninsula KMDA prospects, deposit types, principal commodities, exploration work, and mineral exploration potential (MEP). The prospects are listed in approximate order of significance.

Property name	Deposit type: commodities	Development	MEP
Hungerford (map no. 8)	PR, VMS?: Pb, Zn, Ag;	5 DDH, cuts; drill-defined resource of 63,000 tons at 2.4 oz/t silver, 1.35% lead, and 0.45% zinc.	H
Kuiu (map no. 6)	PR: Pb, Zn	Adit, winze, sublevel, cuts, 14 DDH	M
Skate Creek (map no. 10)	PV, VMS?: Zn, Ba		M
Cornwallis Peninsula (map no. 2)	PV: Ba, Zn		L
Keku Islet (map no. 3)	PV: Zn		L
Katherine (map no. 7)	PV: Ba, Zn	Pit	L
Saginaw Bay (map no. 4)	Unknown	1 DDH	L
Corn (map no. 9)	PR: Ba, Zn	2 or 3 DDH	L
Little Creek (map no. 5)	Unknown: Au?		L

The Kuiu prospect is a replacement of dolomitic limestone with irregular pods of sphalerite and galena. About 150 to 200 tons of high-grade rock that the owners reported to contain 4 to 18 percent zinc, 5 to 6 percent lead, trace to 0.07 oz/t gold and 0.6 to 5.9 oz/t silver was mined from an opencut between 1937 and 1938 (Thorne, 1948). However, channel samples collected from the opencut contained only 0.18 to 0.29 percent zinc (Roehm, 1938b). High-grade samples collected by the BLM from this cut contained 313.6 ppm to 21.72 oz/t silver, 10.31 to 20.54 percent lead, and 7.7 to 13.4 percent zinc (map no. 6.1, samples 9578, 9615).

At the Hungerford prospect, lead and zinc are disseminated in amygdaloidal basalt, as fracture- and open-space-filling veins in volcanics and volcanic breccia, and as replacing dolomite where it is cut by fractures. A Bureau of Mines drilling and sampling program estimated a resource of "...63,000 tons assaying 2.4 oz/t silver, 1.35 percent lead, and 0.45 percent zinc" (Thorne, 1950b, p.1).

At Skate Creek, zinc, lead, and barite mineralization replaces sheared breccia zones in felsic volcanic rocks. The mineralized zone is up to approximately 60 feet wide and extends for approximately 350 feet along Skate Creek. The breccia zones are commonly in fault contact with the hosting massive, felsic volcanic tuffs. They are commonly silicified and pyritized with some calcification. Higher-grade parts of the breccia zones seem to be associated with faults. The best sample of mineralized breccia was across 16 feet and contained 4,344 ppm zinc (map no. 10.5, sample 3879).

Hedderly-Smith (1993) suggests that the Skate Creek breccia zones may be feeder zones for overlying VMS deposits or strata-bound zones that indicate the potential for VMS mineralization. Alternatively, the breccia zones may be epigenetic, carbonate-hosted, replacement deposits similar to those found elsewhere on Cornwallis Peninsula and may not be related to the Triassic VMS mineralization in the Duncan Canal KMDA.

Five of the remaining six prospects in the Cornwallis Peninsula KMDA consist of lead, zinc, and barium polymetallic vein and replacement occurrences (map nos. 2-4, 7, 9). As they are now understood, they all have a low MEP.

Conclusions

The Cornwallis Peninsula KMDA polymetallic vein and replacement mineralization is too small and low-grade to attract development. Also polymetallic vein and replacement mineralization is a less attractive exploration target than the VMS mineralization found in the Duncan Canal KMDA. However, the size of the Skate Creek zone (60 feet wide by 350 feet long) and its similarity to the Hungerford and Kuiu prospects suggest the potential for continuity between the prospects and larger and/or higher-grade zones. This potential is sufficient to attract some exploration interest.

DUNCAN CANAL KMDA

(Plate 1)

Location Access

The Duncan Canal KMDA is located approximately 10 west of Petersburg. The area is approximately 59 miles long by up to 14 miles wide and consists of areas on the north, east, and west sides of Duncan Canal (photo 34), Castle Island, Woewodski Island, and the central part of Zarembo Island (pl. 1). The topography is moderate with elevations ranging from sea level to 2,600 feet. The greatest distance from tidewater is approximately 8 miles, but most of the KMDA lies within a few miles of tidewater. The area is covered with muskeg, brush, and timber. Access is by boat, float plane, and helicopter. Table 5 lists the prospects found in the Duncan Canal KMDA and their map numbers, which are shown on plate 1.

Photo 34. View to the north of the north end of Duncan Canal. Towers Arm is on the left; North Arm on the right. Photo by P. Bittenbender.

History

Mineral activity in the Duncan Canal KMDA started on Woewodski Island at the Hattie gold prospect in the late 1890's (Roppel, 2001). Small amounts of gold were produced in 1905 at the Helen S Mine and between 1915 and 1936 at the Maid of Mexico Mine (Wright and Wright, 1905; U.S. Bureau of Mines, Mine Production records). Between 1966 and 1980, the Castle Island Mine produced 786,888 tons of barite (Carnes 1980).

In 1978 Amoco Minerals Co. (Amoco) staked a large block of claims at the north end of Duncan Canal that included the Northern Copper and the Salt Chuck prospects. The company's geologists were among the first to recognize the importance of VMS deposits in the Duncan Canal area. In 1978 and 1979 the company carried out airborne geophysical surveys; ground electromagnetic, magnetic, and gravity surveys; geologic mapping; soil and stream sediment geochemical sampling; and core drilling (Zelinski, 1979?; Amoco Minerals Company, 1979).

Most of the northern part of Woewodski Island was staked during the 1970's and early 1980's. This included the Lost show, Scott, and Fortunate 1-3 prospects. Cominco, Colony Pacific, Amselco, Kennecott, Houston International Minerals, and Westmin Resources were all active in the area sometime between 1978 and 1998. During the late 1980's and early 1990's, soil sampling and diamond drilling were used to evaluate VMS prospects on Woewodski Island (J. McLaughlin, C. Rockingham, oral commun., 1998).

BP Alaska Exploration staked 10 square miles of ground on the north end of Zarembo Island. This ground included the Frenchie prospect. BP Alaska Exploration mapped and sampled the prospect and recognized its importance as a strata-bound massive sulfide deposit. In 1979 the company conducted a helicopter electromagnetic and magnetic survey, stream sediment and soil sampling, and follow-up ground geophysics over the 10 square miles of ground that contained the deposit and its host rocks (Brewer, 1979). In 1984 three holes were drilled on the Frenchie prospect. In 1996 Westmin Resources drilled another five holes (Rockingham, 1996).

In 1989 ATNA Resources, Inc. staked the Go claims on the west side of Duncan Canal and claims covering the Lost Zarembo and Round Point prospects on Zarembo Island. ATNA conducted geophysics and soil sampling on these prospects (DeLancey, 1990). Pacific Alaska Resources Co. currently has a large block of claims covering the Go prospect. In 1998 and 1999 this company filed a plan of operations with the Forest Service to drill up to 12 diamond drill holes.

In 1997 Kennecott Exploration, Inc. staked a block of claims that covered the Taylor Creek and Upper Taylor Creek prospects. During 1999 and 2000, Kennecott collected soil samples, conducted geophysics, and drilled at least five diamond drill holes on the claims (R. Franklin, oral commun., 2001).

Geology

Berg and Grybeck (1980) defined a series of Upper Triassic rocks within the Alexander terrane in the Duncan Canal to Etolin Island belt that hosts strata-bound VMS and bedded barite deposits. The Duncan Canal KMDA described herein is a refined definition of that belt based on the current mineral assessment of the area, the identification of additional prospects, mineral industry work, geophysical exploration, and the use of the most up-to-date geology.

The Duncan Canal KMDA is defined by 19 VMS occurrences hosted in Triassic rocks (table 4). Also included are the adjacent Triassic rocks. These occurrences contain principally base metals: zinc, lead, and copper, locally with byproduct gold and silver. Barite is a constituent in many of the occurrences, but is only considered a recoverable commodity at the Castle Island Mine.

The Duncan Canal VMS area is part of a belt of Triassic rocks on the eastern margin of the Alexander terrane that extends the length of southeastern Alaska and into northwest British Columbia (Taylor, 1997; Newberry and others, 1997). The belt includes the world class Windy

Craggy deposit in northwest British Columbia (Still, 1984; Peter, 1988), approximately 230 miles to the northwest of the Stikine area. The belt also includes the Greens Creek deposit, a polymetallic VMS deposit currently being mined by Kennecott Greens Creek Mining Co., approximately 80 miles to the northwest (Berg, 1981; Newberry and Brew, 1997). Approximately 60 miles to the southeast of the Stikine area, the belt includes VMS occurrences on Gravina and Annette islands in southeastern Alaska (Berg, 1981).

The Triassic Rocks in the Duncan Canal area have been regionally and/or contact metamorphosed and deformed (McClelland & Gehrels, 1990). The VMS occurrences of Triassic age would be similarly affected and are likely to be dismembered and metamorphosed with possible remobilization of constituents.

Summary of Prospects

Table 4. Duncan Canal KMDA prospects, deposit types, principal commodities, exploration work, and MEP. The prospects are listed in approximate order of significance.

Prospect name	Deposit Type: Commodities	Development	MEP
Volcanogenic massive sulfide			
Lost Show (map no. 47)	VMS: Zn, Pb, Ag	16 DDH, trenches	H
Frenchie (map no. 66)	VMS: Zn, Cu, Pb, Ag	8 DDH, adit, shaft?	H
Scott (map no. 51)	VMS: Zn, Pb	3 DDH, cut, soil grids	H
West Duncan (map no. 34)	VMS: Zn, Ag, Pb	Trenches, soil grids	H
Kupreanof Pyrite (map no. 35)	VMS: Zn, Ag, Pb	Trenches, soil grids	H
Upper Taylor Creek (map no. 30)	VMS: Zn, Pb, Ag	5 DDH	M
Castle Island Mine (map no. 36)	VMS: Barite	Mostly mined out deposit	M
Rubble (map no. 37)	VMS		M
Helen S VMS showing (map no. 44)	VMS: Zn, Ag, Pb	Pit	M
East of Harvey Lake (map no. 50)	VMS: Zn	9 DDH	M
Mad Dog 2 (map no. 58)	VMS: Zn, Au, Ag, Cu	2 DDH, cut	M
Brushy Creek (map no. 59)	VMS: Zn, Pb, Ag	Soil grids, cuts	M
Round Point (map no.71)	VMS: Cu, Zn, Ag	2 DDH, soil grids	M
Lost Zarembo (map no. 67)	VMS: Zn, Cu, Pb, Ag	Borrow pit	M
Spruce Creek (map no. 39)	PR, VMS?: Zn, Ag, Pb	2 shallow DDH	M
RD8 (map no. 23)	VMS: Zn		M
Fortunate 1-3 (map no. 55)	VMS: Zn, Pb, Ag, Au		L
East Duncan Pyrite (map no. 38)	VMS		L
Ironton (map no. 27)	VMS	Trench/cut	L
Polymetallic replacement			
Northern Copper (map no. 25)	PR/Skarn?, VMS?: Cu, Zn	3 adits, shaft, 6 DDH	M
Salt Chuck (map no. 28)	PR, VMS?: Cu, Zn, Pb	5 DDH	M
Taylor Creek (map no. 31)	PR: Ag, Zn, Pb	4 DDH, trenches	L
Porphyry/disseminated sulfide (P)			
Portage Bay Pit (map no. 26)	P: Cu, Mo, Zn, Pb	Borrow pit, road cuts	M

Vein gold			
Hope (map no. 46)	V: Au	2 trenches	M
Maid of Mexico Mine (map no. 48)	V: Au	3 adits, stopes, cuts, mill	M
Scott Gold (map no. 52)	V: Au		L
Helen S Mine, (gold part) (map no. 44)	V: Au	2 shafts, pits, cuts, mill	L
Harvey Creek (map no. 45)	V: Au	Adit, cuts, mill, 2 DDH	L
Independence (map no. 57)	V: Au	Shaft	L
Hattie (map no. 56)	V: Au	Adit, winze, raise, pits	L
Maid of Texas (map no. 49)	V: Au		L
Olympic Resources Gold (map no. 60)	Unknown: anomalous Au	7 DDH, soil grids	L
Other, less significant, prospects in the Duncan Canal KMDA: Towers Creek, Portage Creek, Nicirque, Southwest Duncan, Boulder Point, Finzens, ZF, and Indian Point. As currently understood, these prospects are little known, of limited extent and grade, and have low MEP's.			

Of the 19 VMS occurrences within the Duncan Canal KMDA, 3 have been sufficiently explored to define resources or known extent, and average grade: the Castle Island Mine, the Lost Show, and the Frenchie. Based on mine records, Carnes estimated 705,000 tons of barite resources in irregularly shaped lenses and detrital material at the Castle Island Mine. These resources grade 85 percent $BaSO_4$ or greater and are all located at depths greater than 60 feet below sea level (R. D. Carnes,1980; oral communication, 1999) . Based on 16 diamond drill holes and surface sampling, the Lost Show has an estimated 500,000 tons that average 8.1 percent zinc, 0.6 percent lead, and 2.5 oz/t silver (Terry, 1998). Based on 13 samples, it is estimated that a narrow, 460-foot-long sulfide band at the Frenchie prospect averages 0.47 oz/t gold, 0.42 oz/t silver, 0.55 percent copper, 0.08 percent lead, and 1.48 percent zinc (Brewer, 1979).

The Upper Taylor Creek, Scott, West Duncan, Kupreanof Pyrite, and Fortunate 1-3 prospects have either extent, grade, or adjacent geochemical anomalies of sufficient magnitude to indicate potential exploration interest. Kennecott Exploration Co. conducted geophysical surveying, soil sampling, and drilling at the Upper Taylor Creek prospect from 1997 to 2000 (R. Franklin, oral commun., 2001). The Scott prospect has base metal sulfide mineralization scattered over a distance of 300 feet and a sample from a 0.3-foot-thick band contained 40.9 percent zinc (map no. 51.7, sample 329). At the West Duncan and Kupreanof Pyrite prospects (also known as the Go claims), zinc geochemical anomalies are located within a mile of the beach, where samples across a narrow sulfide band contained up to 30.8 ppm silver, 5,400 ppm lead, and 5.4 percent zinc (map no. 34.1, samples 2622, 9645). At the Fortunate 1-3, samples across narrow sulfide bands located in the intertidal zone contained up to 3,927 ppb gold, 630.4 ppm silver, 9.76 percent lead, and 20.11 percent zinc (map nos. 55.2, 55.3, 55.6, samples 28, 211, 9723). The remaining VMS occurrences listed in table 5 (not discussed above) have sufficient indications of favorable geology, grade, or extent to indicate the potential for some exploration interest.

Also included in the Duncan Canal KMDA area are three polymetallic replacement prospects, one potential porphyry/disseminated sulfide prospect, and a series of gold occurrences on Woewodski Island (map nos. 44-46, 48, 49, 52, 56, 57, 60). Two of the polymetallic replacement prospects, the Northern Copper and Salt Chuck (map nos. 25, 28), are hosted in

Devonian metamorphic rocks. There is insufficient data to rule out a VMS origin for either of these deposits. Both have sufficient extent and grade to attract exploration interest, but their location in a wilderness area precludes exploration. The third polymetallic replacement deposit (map no. 31) is hosted in Hyd Group rocks of Triassic age. The best diamond drill hole intercept at Taylor Creek was 5 feet of 0.8 oz/t silver, less than 0.1 percent lead, and 2.5 percent zinc (Kerns, 1950). The potential porphyry prospect, Portage Bay Pit (map no. 26), is little known and very low grade. As it is now understood, it is not likely to attract significant exploration interest.

There are nine gold prospects on Woewodski Island (table 5). All are hosted in Triassic Hyd group semischist and phyllite. Eight are narrow gold-bearing quartz veins; the other contains low-grade gold and arsenic anomalies. Small mills on three of the prospects indicate attempts at production; a small production was realized at the Maid of Mexico Mine (map no. 48). The two best vein gold prospects are the Maid of Mexico Mine, where 250 feet of drift averaged 0.2 oz/t gold (Magill, undated), and the Hope, where two samples across 8.7 feet of a wider vein averaged 4,440 ppb gold (map nos. 46.2, 46.3, samples 686, 687). Even the best of the gold prospects are too narrow, limited in extent, and low-grade to attract significant exploration interest.

Conclusions

Within the Duncan Canal KMDA 16 VMS prospects have the extent or grade to attract exploration interest. All of the Triassic volcanic and sedimentary rocks in the area are potential hosts for VMS deposits. The polymetallic replacement, the porphyry/disseminated sulfide, and the Woewodski Island gold prospects are either restricted by wilderness classification or are of such limited size and grade that they are unlikely to attract exploration interest.

The Duncan Canal KMDA is fairly well explored along the shorelines. Farther inland, the area is mostly covered with muskeg, brush, and timber, and except for creek beds and rare outcrops in the timber, the inland area is relatively unexplored. Geophysics and soil sampling are important exploration tools in this densely vegetated area.

GROUNDHOG-BERG BASIN KMDA

(Plate 1)

Location and Access

The Groundhog-Berg Basin KMDA is on the mainland approximately 13 miles east of Wrangell. The KMDA is 5 miles wide and 13 miles long (pl. 1). The area is rugged alpine with elevations ranging from 100 to over 5,000 feet. About one fourth of the area is covered by the Nelson Glacier, smaller glaciers, and permanent snow fields. Thick brush predominates at elevations below 2,000 feet. In the early days of exploration in the area, access from Wrangell was by boat to Virginia Lake or to Berg Bay and then by trail to Groundhog Basin, Glacier Basin, or Berg Basin. These trails have long been overgrown. Today, access to the numerous prospects of the Groundhog Basin area is easiest by helicopter. Although small hellipads have been blasted in the rock at some prospects, others require visitors to scramble on steep rock and snow. Table 6 lists the prospects found in the Groundhog-Berg Basin KMDA and their map numbers; their locations are shown on plate 1.

History

Mineral exploration started in the Groundhog-Berg Basin KMDA with the discovery of the Glacier Basin prospect in 1898 (Roppel, 1987). Between 1904 and 1950, the Groundhog Basin deposit was the center of most activity in the KMDA; work in the area was accomplished by private companies (Wernecke, 1918; Smith, 1943), the USGS (Buddington, 1921; Gault and others, 1953), and the Bureau of Mines (Muir, 1943; Berryhill, 1964). Four claims were patented (MS 1580) covering the Groundhog Basin deposit in 1930 (Smith, 1943).

Between 1904 and 1950, four adits were driven in the Groundhog Basin deposit; two, in the Glacier Basin prospect; three, in the Lake prospect; and one, in the Berg Basin prospect (Ray, 1953). During the late 1950's, the Moneta Porcupine Co. staked claims and explored areas to the north, east, and south of the Groundhog Basin deposit, but subsequently dropped the claims (Berryhill, 1964).

In 1965 the Bunker Hill Mining Co. optioned the area around Groundhog Basin with 294 claims known as the Whistlepig claims. These claims cover areas to the north and east of the Groundhog Basin deposit and the area south to the Glacier Basin prospect. This 294-claim area is often referred to collectively as the Groundhog Basin area, and all of it is included within the larger Groundhog-Berg Basin KMDA. Bunker Hill Mining Co. dropped the Groundhog Basin area at the end of the 1965 field season (Bunker Hill Company, 1965). From 1968 to 1981, Humble Oil and Refining Co., El Paso Natural Gas Co., and AMAX Exploration, Inc. alternately optioned the Groundhog Basin area.

Exploration in the Groundhog-Berg Basin KMDA between 1965 and 1981 included 58 diamond drill holes, geophysical surveys, numerous cuts and trenches, and many thousands of samples. Almost all this work was within the Groundhog Basin area (Humble Oil and Refining Company, 1970a; 1970b; George and Wyckoff, 1973; AMAX Exploration Inc., 1979?; 1981; Ray, 1953).

Geology

The Groundhog-Berg Basin KMDA consists of a belt of metamorphosed Paleozoic sediments and volcanics, from 1½ to 2½ miles wide, that strikes approximately 330° and dips approximately 50° to the northeast. The belt is bounded on the east by the 60- to 70-million-year-old great tonalite sill (Brew and Morrell, 1983; Brew, 1997h) and on the west by 90-million-year-old granodiorite (AMAX Exploration Inc., 1981). A metasedimentary pendant within this granodiorite and located 2 miles west of the granodiorite-metamorphic contact are also included in the KMDA. On the northern side of Groundhog Basin, a 16.3-million-year-old biotite-granite stock of Tertiary age intrudes the metamorphic rocks. Sills and dikes of rhyolite composition extend from the stock to form predominately concordant quartz porphyry. The rhyolite sills predominate in the western third of the metamorphic belt (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Studies by Newberry and Brew (1989) indicate that the biotite-granite stock is a zinnwaldite "tin" granite and that some base metal deposits in the area are related to this tin granite.

The belt of sedimentary and volcanic rocks has been metamorphosed to upper greenschist or lower amphibolite facies to form quartz-mica schists and hornblende-biotite-pyroxene-feldspar gneiss. Metamorphism has also produced granulite (calc-silicate gneiss) along layers in the metamorphic rocks (George and Wyckoff, 1973).

Studies by El Paso indicate two major fault trends in the belt of metamorphic rocks (George and Wyckoff, 1973). One trend is parallel to foliation and bedding; the rhyolite sills intrude along this trend. A crosscutting trend strikes approximately 025° (range 005° to 030°) and dips 45° east to vertical. These shears are conduits for polymetallic mineralization that follow both the bedding plane and crosscutting trends throughout the Groundhog Basin area. Narrow layers of granulite (calc-silicate gneiss) and beds of marble have proven to be receptive hosts for the polymetallic mineralization.

Five deposit types have been identified in the Groundhog-Berg Basin KMDA. They are polymetallic vein, polymetallic replacement, skarn, porphyry, and vein gold (table 5). The principal commodities are molybdenum, copper, and zinc in the porphyry deposits; zinc and lead in the polymetallic vein, polymetallic replacement, and skarn deposits; and gold in the vein gold deposit. In addition, silver is found in some of the vein, replacement, and skarn deposits, and tin is found in some of the replacement deposits. It is probable that the zinnwaldite granite is related to all the deposit types except the vein gold.

Summary of Prospects

The North Silver North and Huff prospects are classified as skarn deposits. At these prospects, parts of marble beds, up to 30 feet thick, have been replaced with sulfides resulting in the formation of irregular lenses and zones. The best skarn mineralization is at the Huff prospect where the Huff Marble is exposed for 4,800 feet, and a 300-foot section is erratically mineralized with sulfides. El Paso sampled and drilled two holes to evaluate this prospect. A BLM sample across 7 feet of the sulfides contained 0.62 percent copper, 6.8 percent zinc, 20.08 percent lead, and 2.9 oz/t silver (map no. 107.10, sample 255). A drill hole intercept across a width of 7 feet contained 0.3 percent copper, 4.3 percent zinc, 7.4 percent lead, and 1.4 oz/t silver (George and Wyckoff, 1973). The Huff Marble bed massive sulfide mineralization is of sufficient grade and width to be of exploration interest.

Table 5. Groundhog-Berg Basin KMDA prospects, deposit types, principal commodities, exploration work, and MEP (See pls. 1, 3, 4, and figs. 26-32). All the prospects are located in the Groundhog Basin area except Andrew Creek, Lake, Berg Basin, and Copper King, which are located to the north, west, south, and southeast respectively. Prospects with more than one deposit type defined are listed under the deposit type believed to have the most exploration potential. The prospects are listed in approximate order of significance.

Prospect name	Deposit type: Commodities	Development	MEP
Skarn			
Huff (map no. 107)	Skarn, PV: Pb, Zn, Ag	2 DDH, trenches	H
North Silver North (map no. 93)	Skarn, PV: Ag, Pb, Zn	7 DDH, cuts	H
Nelson Glacier (map no. 105)	Potential for Skarn and PV	2 DDH	M
Polymetallic vein (PV)			
East Marsha Peak (map no. 104)	PV: Zn, Pb	4 trenches	H
North Silver Whistlepig Adit (map no. 95)	PV: Ag, Pb, Zn	1 adit, cuts	H
North Marsha Peak (map no. 103)	PV: Zn, Pb	3 DDH, trenches	M
North Silver West (map no. 94)	PV: Ag, Pb, Zn	Cuts	M
Berg Basin (map no. 110)	PV: Au? Ag, Pb	2 DDH, adit, pits	M
Lake (map no. 109)	PV: Pb, Zn, Cu, Ag	2 adits, pits	M
Northeast Cliffs (map no. 97)	PV: Zn, Sn		L
South Silver (map no. 100)	PV: Zn, Pb, Ag	1 DDH	L
Camp 6 area (map no. 101)	PV: Zn, Ag	Cuts	L
Copper King (map no. 111)	PV: Zn, Cu, Ag	shaft, trench	L
West Nelson Glacier (map no. 106)	PV: Pb, Ag, Zn		L
Polymetallic replacement (PR)			
Groundhog Basin (map no. 98)	PR: Zn, Pb, Sn, Ag	4 adits, 27 DDH	M
Lake Cirque (map no. 102)	PR: Zn, Pb, Sn		M
Glacier Basin (map no. 108)	PR, PV: Zn, Pb	2 adits	L
Porphyry/disseminated sulfide (P)			
AMAX Molybdenum (map no. 96)	P: Mo	4 DDH	L
Copper Zone (map no. 99)	P: Cu, Zn	9 DDH, cuts	L
Vein gold			
Andrew Creek (map no.92)	Potential for vein gold		L

Eleven polymetallic vein prospects have been identified in the KMDA area. They have been explored by four adits, six diamond drill holes, cuts and trenches, and surface samples. The most significant of these are the North Silver Whistlepig Adit and the East Marsha Peak prospects. To date, the best mineralization found is from narrow pinch-and-swell veins that range up to 517.62 oz/t silver at the North Silver Whistlepig Adit prospect (map no. 95.3, sample

121) and a zone up to 30-feet-wide that averages 3.19 percent zinc, 1.67 percent lead, and 1.99 oz/t silver at the East Marsha Peak prospect (George and Wyckoff, 1973). Whereas exploration to date has indicated that the polymetallic-vein-type mineralized zones are either too small or low-grade to be of development interest, the values are sufficiently high in the former case and the zone sufficiently wide in the latter case to attract exploration interest.

The Nelson Glacier, along with smaller glaciers and permanent snow fields, cover almost two-thirds of the Groundhog Basin area. The Huff Marble bed trends under the toe of the glacier and is exposed 2.5 miles to the north-northwest at the head of the glacier. Farther to the north, these beds are mineralized at the North Silver North prospect. Predominantly lead-zinc-silver mineralization replaces the marble beds at the Huff and North Silver North prospects. Crosscutting shears at these prospects are the conduits for the lead-zinc-silver-mineralizing fluids. Some of these shears have high-grade silver contents as well, with up to 228.4 oz/t at the Huff prospect (map no. 107.3, sample 96) and up to 119.32 oz/t at the North Silver North prospect (map no. 93.18, sample 124). To test the continuity of the North Marsha Peak mineralization under the Nelson Glacier to the northeast, Humble Oil drilled two holes through the ice. They were located well to the west of the Huff Marble. Neither encountered significant mineralized rock (Humble Oil and Refining Company, 1970a; 1970b).

The Groundhog Basin, Glacier Basin, and Lake Cirque prospects are classified as polymetallic replacement deposits. At these prospects, narrow bands of pyroxene granulite are replaced with sulfides to form narrow tabular zones that follow the bedding in the rock. The former two prospects were explored by Ventures, Ltd., the USGS, the Bureau of Mines, the Bunker Hill Mining Co., and Houston Oil and Minerals Exploration Co., which resulted in the taking of thousands of chip samples and the drilling of over 23 holes. The latter prospect was mapped and sampled during the current study. The best mineralization found to date is an estimated 466,000 tons of indicated and inferred resources at an average grade of 8 percent zinc, 2.5 percent lead, 2 oz/t silver, and 0.39 percent tin at the Groundhog Basin deposit (Muir, 1943; Bunker Hill Company, 1965; Oliver, 1984). The tabular mineralized zones average 4 feet thick, are parallel, and dip at 40° to 55°. They are separated by 50 to 75 feet of mostly barren schist. The zones are too low-grade, too narrow, and too limited in extent to be considered an attractive development target.

Two porphyry/disseminated sulfide prospects have been identified in the Groundhog-Berg Basin KMDA; the AMAX Molybdenum contains molybdenum, and the Copper Zone contains copper and zinc. Both have been sampled and drilled extensively (George and Wyckoff, 1973; AMAX Exploration Inc., 1981). Neither has the size nor grade to be considered of economic significance.

The one vein gold prospect in the KMDA was discovered during this study and is located at the north end of the KMDA. Samples of quartz float in a narrow drainage contained up to 0.822 oz/t gold (map no. 92.3, sample 146). A brief investigation failed to find the bedrock source of the gold. It is located in a wilderness area that precludes mining.

Conclusions

Silver-lead-zinc mineralization in polymetallic veins, replacements, and skarns is pervasive throughout the Groundhog-Berg Basin KMDA area. Extensive surface exploration and mostly shallow drilling (58 holes) of the Groundhog-Berg Basin KMDA area prospects have not resulted in the discovery of development targets. However, the presence of narrow polymetallic veins with silver grades up to 517.62 oz/t at the North Silver Whistlepig Adit prospect (map no. 95.3, sample 121); polymetallic veins with widths up to 30 feet that average 3.19 percent zinc, 1.67 percent lead, and 1.99 oz/t silver at the East Marsha Peak prospect (George and Wyckoff, 1973); and skarn zones that contain 0.62 percent copper, 6.8 percent zinc, 20.08 percent lead, and 2.9 oz/t silver across 7 feet at the Huff prospect (map no. 107.10, sample 255) all encourage further exploration in the area.

The relatively unexplored area under the Nelson Glacier is also a potential exploration target. The projected intersection under the glacier of the 30-foot-thick Huff Marble and the 30-foot-thick East Marsha Peak mineralized shear zones is an excellent exploration target.

OTHER PROSPECTS OF NOTE

Six prospects in the Stikine area are noteworthy, but are not located in any of the three KMDA's. These are Port Malmesbury (map no. 14), Table Bay (map no. 15), Point Saint Albans (map no. 17), Alikula Bay (map no. 19), North Bradfield River Skarn (map no. 117), and Black Crag (map no. 114). All have medium MEP's.

The three prospects of note on Kuiu Island, Port Malmesbury, Table Bay, and Point Saint Albans are noteworthy not so much individually as they are together. Each is associated with a Cretaceous intrusion of granodiorite to diorite (Brew and others, 1984), which suggests a genetic connection. Along with other occurrences on southern Kuiu Island, these prospects indicate a possible Cretaceous mineralizing event that was relatively widespread. The broad extent of this potential mineralization makes it possible that larger deposits may be found in the area. Wilderness designation precludes mineral exploration at the Port Malmesbury prospect.

The North Bradfield River Skarn is hosted in metamorphosed sedimentary and volcanic rocks, with intercalated marble, that are part of a roof pedant within the Coast Range Batholith. The iron-copper skarn zones are formed in or near the marble where Eocene intrusive rocks are in contact with the metamorphic rocks. Based on at least 20 diamond drill holes and samples from cuts and trenches completed between 1956 and 1962, Utah Construction (1962) estimated 1,000,000 tons of proven and probable resources and 4,481,000 tons of possible resources. The grade is estimated to be 35 to 40 percent iron, 0.2 to 0.3 percent copper, and 3 to 4 percent sulfur. The resource is contained within irregular lenses and pods. The irregular nature and low grade of the deposit make this an unlikely development target.

The Alikula Bay prospect is hosted in limestone that is irregularly replaced by sulfide lenses up to 28 by 10 feet on the surface. A sample across the largest of these lenses contained to 3,347 ppb gold, 15.9 ppm silver, 1,202 ppm copper, 2,556 lead, and 6,630 ppm zinc across 20 feet (map no. 19.3, sample 8762). One of the highest-grade samples assayed 8,483 ppb gold, 22.5

ppm silver, 1,173 ppm copper, 7,515 ppm lead, and 4.89 percent zinc across 8 feet (map no. 19.5, sample 8763). The irregular nature of most replacement deposits suggests any additional mineralized rock found at Alikula Bay would likely be difficult to define and extract. In addition, the wilderness status of the area precludes mineral exploration activity.

The Black Crag prospect is hosted in a Miocene alkali-feldspar granite stock with associated quartz-porphyritic rhyolite dikes and flows (Elliott and Koch, 1981). As it is now known, it consists of molybdenum fracture coatings on volcanic float that are located on a steep area below a 1-mile-wide hanging glacier. Samples of the float contain up to 2,529 ppm molybdenum (map no. 114.2, sample 8860). The float samples were also analyzed for rare earths and related elements. They contained up to 1,740 ppm cerium, 954 ppm lanthanum, 440 ppm neodymium, 60 ppm samarium, 72.6 ppm thorium, and 16 ppm uranium (map no. 114.2, samples 624, 625, 8860, 8861). The combination of molybdenum and rare earth elements makes this an interesting prospect. However, there is insufficient information to attract significant exploration interest.

Although the latter three prospects do not have the grade or tonnage to be development targets, they have sufficient mineralization to be of some exploration interest. The wilderness status of the Alikula prospect precludes additional exploration.

KMDA CONCLUSIONS

The most significant mineral occurrences are concentrated in a relatively small part of the Stikine area. There are 10 occurrences with a high MEP rating in the area, 31 with a medium rating, and 80 with a low rating. All 10 of the high MEP occurrences are located within the KMDA's defined, as are 25 of the medium and 34 of the low rating occurrences. The KMDA's constitute less than 10 percent of the Stikine area.

An approximate comparison between the three KMDA's can be made based on the number of prospects with a medium and high mineral exploration potential (MEP) that each contains. One high and three medium MEP prospects are in the Cornwallis Peninsula KMDA; five high and 14 medium are in the Duncan Canal KMDA; and four high and seven medium are in the Groundhog-Berg Basin KMDA. In addition, only the Duncan Canal KMDA is known to contain VMS prospects, which have been the target of recent mineral industry exploration in the area. The VMS deposits in the Duncan Canal KMDA have been targeted particularly because their Triassic host rocks are correlative with the host rocks of the world class Windy Craggy and Greens Creek deposits to the north. The Duncan Canal KMDA is, therefore, the most important in the Stikine study area and the most likely to attract future exploration activity. Six prospects located outside the KMDA's are assigned a medium MEP. Three are found on Kuiu Island, one on Coronation Island, and two on the Mainland.

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APPENDIX A -SUMMARY INFORMATION

SUMMARY INFORMATION FOR MINES, PROSPECTS, AND MINERAL OCCURRENCES

Appendix Table A-1 lists summary information for mines, prospects, and mineral occurrences found in the Stikine study area. The information provided includes prospect name and Minerals Availability System (MAS) number, location information, land status, deposit type and major commodities present, workings and current condition, production figures (when available), BLM work during this study, selected references for additional information, mineral development potential (MDP), and mineral exploration potential (MEP). The last two categories are a subjective ranking that prioritizes the prospects with respect to one another.

ABBREVIATIONS AND DESCRIPTIONS

Map number:
Refers to mine, prospect, or occurrence numbers used to show locations on plates 1, 2, 3, and/or 4.

Name/MAS no.:
Name refers to the property name. MAS refers to the Minerals Availability System database devised by the Bureau of Mines and currently managed by the Bureau of Land Management in Alaska.

Latitude/Longitude:
Coordinates for each property are expressed in decimal degrees using the North American Datum of 1927 Alaska (NAD27 Alaska) .

Land status:

N	Native
S	State
OF	open Federal (open to mineral entry)
CF	closed Federal (closed to mineral entry)
P	Private

Deposit type: (with commodity abbreviations)

PV	polymetallic vein
PR	polymetallic replacement
Mag Seg	magmatic segregation
P	porphyry
Dissem	disseminated sulfide
VMS	volcanogenic massive sulfide
Peg	pegmatite
SSb	simple antimony

Development:

T('s)	trenches(es)
#Pit(s)	pit(s), (flooded in parentheses)
# Cuts	cut(s), in feet
# Adits(s):	lengths, in feet; (caved lengths in parentheses)
# Shafts(s):	depths, in feet; (flooded depths in parentheses)
# DDH	diamond drill holes

BLM work:

M	mapped
S	sampled
R	reconnaissance, reconnaissance sampling
NF	not found
NE	not examined

Select references:

See references listed on page 405.

MDP (mineral development potential):

All mines, prospects and mineral occurrences are assigned a high, medium, or low mineral development potential classification. These rankings reflect the authors' opinions with regard to each property. The rankings are based on the following criteria:

H High grades and probable continuity of mineralized rock exist. The property is likely to have economically mineable resources under current economic conditions. A high potential exists for developing tonnage or volume with reasonable geologic support for continuity of grade.

M Either a high grade or continuity of mineralized rock exists, but not both. Mineralized rock is confined by geology and/or structures, or grades are overall low. It could serve as a resource if economics were not a factor, but is presently uneconomic under existing conditions.

L The property exhibits uneconomic grades and/or little evidence of continuity of mineralized rock. There is little or no obvious potential for developing resources or is an insignificant source of interest.

MEP (mineral exploration potential):

All mines, prospects, and mineral occurrences are assigned a high, medium, or low mineral exploration potential classification, which addresses the likelihood of a site being explored in the future. This ranking differs from the MDP described above in that MEP may be higher with less knowledge of the extent and grade of the occurrence. The rankings do not reflect the current land status at the site, but do take into account the potential for extent of mineralized rock, e.g., geographic limitations such as tidewater. These rankings reflect the authors' opinions with regard to each property. One of the authors' intents in making these rankings is to identify for land managers areas that may attract future mineral exploration interest. The rankings are based on the following criteria:

H The site has some potential for hosting an economic mineral deposit. The deposit type is one that may have been locally explored in the recent past. It may be part of a larger identified mineralizing system. There is a high likelihood that additional mineralized rock and/or higher grade material will be found. The site is likely to receive mineral exploration attention in the future.

M There is a medium likelihood that additional mineralized rock and/or higher grade material will be found at the site. The site may be part of a larger mineralizing system, but one that is newly identified and/or has not attracted recent exploration interest in the local area. The site may receive mineral exploration attention in the future, particularly if economic conditions change and/or our knowledge of the occurrence changes.

L Too little is known about the site to determine the likelihood of future mineral exploration attention or the site is so well known that there is little chance that additional mineralized rock and/or higher grade material will be found. The site is unlikely to host an economic mineral deposit and is unlikely to attract mineral exploration attention in the future.

Table A-1 Summary information table for mines, prospects, and occurrences

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
1	Allied Mine Group E 0021160022	56.9078 -134.2952	OF	Vein: Ba	None	Narrow discontinuous barite veins in volcanic rocks.	S	Alaska Kardex 116-002E	L	L
2	Cornwallis Peninsula 0021160008	55.9156 -134.3295	N	PV: Ba, Zn	None	2.3 ft vein contained 44.46% Ba; grab sample contained 8,382 ppm Zn.	S	Buddington, 1925	L	L
3	Keku Islet 0021160012	56.1111 -134.1797	N	PV: Zn	None	Samples of ladder veins in dike contained up to 31.7% Zn.	S	Buddington 1925; Jermain and Rutledge, 1949	L	L
4	Saginaw Bay 0021160059	56.8950 -134.1838	OF	Unknown	1 DDH	Stream sediment contained 1,079 ppm Ba.	S	Hedderly-Smith, 1993	L	L
5	Little Creek 0021160033	56.5735 -133.0582	N	Unknown: Au?	None	Stream sediment sample contained 401 ppm Pb and 176 ppm Ba.	S	Alaska Kardex 116-031	L	L
6	Kuiu 0021160003 (previously referred to as Kuiu Lead-Zinc)	56.8978 -134.1053	N	PR: Ag, Pb, Zn	Adit: 55; 14 DDH	High-grade grab samples ran as high as 21.72 oz/t Ag, 20.54% Pb, and 13.4% Zn.	S	Roehm 1937, 1946	L	M
7	Katherine 0021160013 (aka Acme No. 1&2)	56.1595 -132.6444	N	PV: Ba, Zn, Pb	Pit	Samples contained greater than 2% Ba, 3.2% Zn, and 2,355 ppm Pb.	S	Buddington 1925; Rutledge, 1949	L	L
8	Hungerford 0021160004	56.5472 -133.0390	N	PR, VMS?: Ag, Pb, Zn	5 DDH, cuts	Drilling delineated ore reserves of 63,000 tons with 2.4 oz/t Ag, 1.35% Pb, and 0.45% Zn.	S	Thorne 1948, 1958	L	H
9	Corn 0021160035	56.9204 -134.1858	OF, N	Vein: Ba	3-4? DDH	Narrow barite veins in volcanics.	S	Hedderly-Smith, 1990	L	L
10	Skate Creek 0021160067	56.8700 -134.0397	OF	PV, VMS?: Zn, Ba		Siliceous sulfide-bearing breccias in felsic volcanics; up to 11.8% Zn in float, 2.2% Zn over 2 ft, and 0.4% Zn over 16 ft.	M, S	Hedderly-Smith, 1993	L	M
11	Saginaw Bay Barite 0021160015	56.8746 -134.2233	OF	Vein: Ba	None	Samples contain greater than 2% Ba.	S	Buddington, 1925	L	L
12	Kadake Bay 0021170199 [PE001]	56.9884 -133.9591	N	Sedimentary: U_3O_8, REE	None	Anomalous U up to 46 ppm and REE.	S	Dickinson, 1979; Eakins, 1975	L	L

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13	Kuiu 1-9 0021160003 (previously referred to as Kuiu)	56.6664 -133.2566	OF	Unknown: Au	None	A pan concentrate sample from a sand filled box contained 2255 ppb gold: stream sediment samples contained 24 ppb Au and 130 ppm Zn.	S	Alaska Kardex 117-085	L	L
14	Port Malmesbury 0021160020	56.2400 -134.2045	CF	PV: Au, Zn, Cu, Pb	None	Near Cretaceous intrusion; Au to 18 ppm in quartz float; sulfides in quartz veinlets contain Zn to 10.2% with minor Cu, Ag, & Au.	S	Brew & others, 1989	L	M
15	Table Bay 0021160070	56.1344 -134.2522	OF	Skarn: W	None	Skarn near Cretaceous intrusion; sulfide pods in skarn with >2,000 ppm W and elevated Cu & Mo.	S	Karl & Koch, 1990; Brew and others, 1989	L	M
16	Kell Bay 0021160066	56.7982 -133.9435	OF	PV: Zn, Ag, Pb, Cu	None	Sulfides in silicified shear in limestone and chert near Cretaceous intrusion; values to about 1.5% Zn, 25 ppm Ag, 8,692 ppm Pb.	M, S	Roehm, 1942	L	L
17	Point Saint Albans 0021170022 [PE045]	56.1088 -133.9577	OF	PV: Au, Ag, Zn, Pb	None	Shear zones near Cretaceous intrusion with sulfides; samples to 5,839 ppb Au, 342 ppm Ag, 9.9% Zn, and 8.15% Pb.	S	Grybeck & others, 1984	L	M
18	Coronation Island 0021190036	56.4526 -131.2372	CF	PR: Pb, Ag, Au, Zn	3 Adits; 1 Cut, T	Fault-controlled galena replacement in Silurian limestone; up to 13.95 ppm gold, 682 ppm silver – mostly much lower values, small extents.	S	Twenhofel & others, 1949; Roehm, 1940	L	L
19	Alikula Bay 0021190335	55.9183 -134.2959	CF	PR: Au, Ag, Pb, Zn, Cu	None	High grade base and precious metals; up to 8,483 ppb gold, 29.2 ppm silver, 1,173 ppm copper, 7,515 ppm lead, and 4.89 percent zinc across 8 feet.	M, S	Roehm, 1942	L	M
20	Pinta Point 0021150071	57.0981 -133.8839	N	VMS: Au, Cu, Zn	None	Graphitic schist hosts disseminated to massive pyrite and pyrrhotite with small amounts of sphalerite and chalcopyrite. Samples contain up to 661 ppm Cu and 1,595 ppm Zn.	S	This study	L	L
21	Kake Area Road System 0021170200	56.9796 -133.1140	N, OF	VMS: Ag, Pb, Zn, Ba PV: Au,	None	Most prospective mineralization found is rubble crop from a massive barite vein that contained 13.1 ppm Ag, 1.02 % Pb, 3.0 % Zn and 48.3 % Ba.	S	This study	L	L
22	Gunnuk Creek 0021170034 [PE002]	56.5645 -133.0595	N	Unknown	None	Stream sediment samples did not contain significant metal values.	S, NF?	Alaska Kardex 117-074	L	L

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23	RD8 0021170197	56.8366 -133.5609	OF	VMS: Zn, Pb	None	Occurrence defined by geochemical anomalies; up to 1,762 ppm Zn over 4 ft, 920 ppm Pb; also elevated Hg, As, Co, Ni.	S	Bittenbender & others, 2001	L	M
24	Towers Creek 0021170198	56.8583 -133.4007	OF	VMS?: Cu?	None	Silicified schist contains disseminations and narrow bands of pyrite and sparse chalcopyrite; samples contained up to 713 ppm Cu.	S	This study	L	L
25	Northern Copper 0021170011 [PE005]	56.3454 -132.3473	CF	PR/Skarn?, VMS?: Cu, Zn	3 Adits: 285, 35, (375); Shaft, Pits, T's, 6 DDH	Cu-Zn mineralization hosted in metavolcanic rocks; sulfides disseminated, in lenses, and layered(?); samples to: 0.25 ft @ 440 ppb Au; 2 ft @ 37.7 ppm Ag; 2 ft @ 12.4% Cu; 1.5 ft @ 2.4% Zn.	M, S	Zelinski, 1979; Buddington, 1923; US Bureau of Mines, 1945	L	M
26	Portage Bay Pit 0021170193	56.9145 -133.2687	OF	P: Cu, Mo PV: Au, Ag, Zn, Pb	None	Diorite in borrow pit contains 1-2% pyrrhotite, minor chalcopyrite, & rare molybdenite; pit averages 163 ppm Cu; select sample contained 3,271 ppb Au, 3,025 ppm Cu, and 1.4% Zn; samples had up to 855 ppm Mo & 1,365 ppm Ni.	S	This study	L	M
27	Ironton 0021170196 [PE008]	57.4806 -133.4763	OF	VMS	Adit: 15; T(s)	Metavolcanics and slate with layered and disseminated sulfides; low precious and base metals.	M, S	Roehm, 1946	L	L
28	Salt Chuck 0021170195	56.8408 -133.3226	CF	PR, VMS?: Cu, Zn, Pb	5 DDH, Cuts	8,000-ft geophysical anomaly explored with 5 DDH; best intersection is 1.7 ft at 1.86% Cu; samples across the best surface showings contained up to 7.1% Cu.	S	Zelinski, 1979; Amoco Minerals Co., 1979;	L	M
29	Portage Creek 0021170194 [PE009]	56.8501 -133.2598	CF	Mag Seg: Cu, Pt, Pd	None	Pyrrhotite, pyrite, and chalcopyrite in hornblendite; samples up to 4,666 ppm Cu over 15 ft, 39 ppb Pt over 18 ft, and 59 ppb Pd over 27 ft.	S	Buddington, 1923	L	M
30	Upper Taylor Creek 0021170201	56.7960 -133.3829	OF	VMS: Au, Ag, Zn, Pb	5 DDH	Semi-massive to massive sulfides in chlorite schist and slate; drilled by Kennecott Exploration in 2000	S	This Study	L	M

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31	Taylor Creek 0021170013 [PE006]	56.7961 -133.3579	OF	PR: Ag, Zn, Pb	4 DDH, T's	Irregular pods of pyrite with sphalerite and galena in dolomite; best drill intercept 5 ft of 0.8 oz/t Ag, less than 0.1% Pb, and 2.5% Zn	S	Kerns, 1950; Roehm, 1946	L	L
32	Kane Peak 0021170035 (aka Joyce Ann) [PE010]	56.9017 -134.0786	OF	Mag Seg: Fe?, PGE?	None	Alaska zoned mafic-ultramafic complex; two samples had over 100 ppb Pt, one sample at 180 ppb Pd.	S	Bannister, 1962; Walton, 1951	L	M
33	Indian Point 0021170054 [PE023]	56.8280 -133.3557	OF	None	None	0.15-ft thick conformable pyrite band exposed in the intertidal zone contained 187 ppb Au.	S	Alaska Kardex 117-087A	L	L
34	West Duncan 0021170191 (aka GO, Halobia) [PE025]	56.6721 -133.2582	OF	VMS: Zn, Ag, Pb	Soil sample grids, Pit	Sulfide bands up to 1.5 ft thick exposed in creek bed for up to 40 ft; samples across bands contained up to 30.8 ppm Ag, 5,400 ppm Pb, and 5.4% Zn; Triassic host rocks.	S	DeLancey, 1990	L	H
35	Kupreanof Pyrite 0021170038 (aka GO) [PE024]	56.4737 -132.0954	S, OF	VMS: Zn, Ag, Pb	Soil sample grids, Pit	Samples across 6-ft thick lens of pyrite contained up to 31.8 ppm Ag, 1,304 ppm Pb, 1.7% Zn, and 1,268 ppm arsenic; Triassic host rocks.	S	Buddington, 1923	L	H
36	Castle Island Mine 0021170002 [PE026, PE027]	56.6522 -133.1675	S, P: (MS 1452)	VMS: Ba	Mine	390,000 tons of low grade and 315,000 tons of higher-grade barite resources located under water; hosted in Triassic rocks; 786,888 tons of barite produced.	S	Carnes, 1980	L	M
37	Rubble 0021170176	56.6609 -133.0940	OF	VMS: Zn	None	Disseminations, layers, and lenses of pyrite in interbedded schist and slate.	S	Bittenbender & others, 2001	L	M
38	East Duncan Pyrite 0021170177	56.4906 -132.0284	OF	VMS	None	Bedded pyrite in slate; generally low metal values, but elevated barium, nickel, and chromium.	S	Taylor, in press	L	L
39	Spruce Creek 0021170190	56.6640 -133.0289	OF	VMS?, PR: Zn, Ag, Pb	2(?) DDH	Three mineralized areas exposed on prospect; 0.4-ft sample across marble bearing sphalerite and galena contained 779 ppb Au, 59.1 ppm Ag, 5.62% Pb, and 2.1% Zn; hosted in Triassic rocks.	S	This study	L	M
40	Nicirque 0021170185	56.3871 -131.3870	OF	VMS?: Zn	None	Sample of schist with pyrite bands contained 333 ppm Zn; hosted in Triassic rocks.	S	This study	L	L

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41	Southwest Duncan 0021170189	56.5653 -133.0993	OF	VMS: Au, Cu	None	Samples from greenstone rubblecrop with small amounts of pyrite and chalcopyrite contained up to 821 ppb Au, 1,189 ppm Cu, and 1,906 ppm As.	S	Zelinski, 1979	L	L
42	TB 0021170129 [PE019, PE020]	56.5245 -133.5400	OF	Unknown	None	Vivid exposures of orange-yellow, altered rhyolite in the area; samples contained up to 425 ppm Zn.	S	Alaska Kardex 117-089; Grybeck and Berg, 1998	L	L
43	Monongehela 0021170047 [PE021]	56.1448 -132.5855	OF	Unknown: U_3O_8, REE	None	Samples contain up to 7 ppm uranium, 17 ppm thorium, 43 ppm neodymium, 38 ppm lanthanum, and 110 ppm cerium.	S	Houston and others, 1958	L	L
44	Helen S Mine 0021170014 [PE028]	56.5722 -133.0588	P: (MS 614)	Vein: Au, VMS: Zn, Ag, Pb	2 shafts-flooded, Pits, T's	36 samples collected from this prospect contained up to 0.328 oz/t Au, 113.5 ppm Ag, 12.8% Zn, and 2.5% Pb.	M, S	Wright and Wright, 1908; Roehm, 1945	L	M
45	Harvey Creek 0021170179 [PE030]	56.5327 -133.0478	OF	Vein: Au	Adit-caved; Cuts, 2 DDH	High grade stringer reported to assay up to 1.89 oz/t across 1 ft; BLM samples from quartz dump near high grade stringer contained 341 and 6,811 ppb Au; DDH's did not contain significant values.	M, S	Northwest Woewodski, 1933	L	L
46	Hope 0021170180	56.4834 -131.9956	OF	Vein: Au	T's	8.7 ft of samples across part of a 19-ft thick quartz vein/lens averaged 4,440 ppb gold.	M, S	Northwest Woewodski, 1933	L	M
47	Lost Show 0021170182 [PE029]	56.3818 -132.8984	OF	VMS: Zn, Pb, Ag	16 DDH, T's	500,000 tons averages 8.1% Zn, 0.6 % Pb, and 2.5 oz/t Ag in a narrow sulfide band; hosted in Triassic rocks.	M, S	Terry, 1998	M	H
48	Maid of Mexico Mine 0021170015 [PE031]	56.5651 -133.0291	OF	Vein: Au	3 Adits-1 caved, Cuts, Stopes, Mill	Possible production of 1,196 oz Au; vein exposed along a 250-ft drift averages 0.2 oz/t Au at widths of 1-4 ft.	M, S	Williams, 1954; Magill, undated	L	M
49	Maid of Texas 0021170184 [PE031]	56.6671 -132.2380	OF	Vein: Au	None	Samples contained up to 68 ppb Au and 782 ppm Zn.	M, S	Northwest Woewodski, 1933	L	L

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50	East of Harvey Lake 0021170178 [PE034]	56.4213 -132.5330	OF	VMS: Zn	9 DDH	0.4-ft band of massive pyrite in silicified schist contained 1,023 ppm Zn; discovery DDH drilled before 1998, collared east of Harvey Lake, reported to contain significant zinc values; 8 DDH in 1999; hosted in Triassic rocks.	M, S	P. Beardslee, oral commun.	L	M
51	Scott 0021170187	56.5733 -133.0054	OF	VMS: Zn, Pb	3 DDH, Cuts	Base-metal sulfides and barite scattered along a shear zone exposed for 300 ft along strike; sample across 0.3-ft thick band of massive sphalerite contained 40.9% Zn.	M, S	Rockingham, 1996	L	H
52	Scott Gold 0021170188	56.5751 -133.0020	OF	Vein: Au	None	Samples of quartz or heavily silicified volcanic rubble contained up to 1,793 ppm Au, 2,559 ppm Pb, and 2.52% Zn.	M, S	This study	L	L
53	Boulder Point 0021170170	56.5815 -132.9759	OF	VMS?: Cu	None	Iron-stained, silicified andesite with pyrrhotite and chalcopyrite along fractures contained up to 929 ppm Cu; hosted in Triassic rocks.	S	This study	L	L
54	Finzens 0021170172	56.5332 -133.0531	OF	Unknown: Cu	None	Three stream sediment and four rock samples collected; only one contained significant values: 1,943 ppm Cu; hosted in Triassic rocks.	S	Wright and Wright, 1908	L	L
55	Fortunate 1-3 0021170040 (formerly referred to as Fortune) [PE035]	56.7197 -132.7799	S (inter-tidal zone)	VMS: Au, Ag, Zn, Pb	None	Silicified greenstone zone 15 ft wide, exposed for 160 ft contains bands of sulfides; samples of narrow sulfide bands contained up to 3,927 ppb Au, 630.4 ppm Ag, 9.76% Pb, and 20.1% Zn; hosted in Triassic rocks.	M, S	P. Beardslee, oral commun.	L	L
56	Hattie 0021170016 [PE032]	56.5686 -133.0662	OF	Vein: Au	Adit: 325; Pit, Cuts	27 samples collected from veins and workings without significant metal values; adit with 65-ft raise and winze with 2 levels.	M, S	Rohm, 1945	L	L
57	Independence 0021170181	56.7401 -133.2443	OF	Vein: Au	Shaft-flooded; T's	Samples of quartz from dumps, outcrop, and rubblecrop contain up to 94 ppb Au.	S	Nelson, 1931; Northwest Woewodski, 1933	L	L

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58	Mad Dog 2 0021170183	56.5653 -133.0321	OF	VMS: Au, Ag, Zn, Cu	2 DDH, cut	Narrow, conformable, sulfide band in creek bank; samples contained up to 2,867 ppb Au, 27.1 ppm Ag, 1,512 ppm Cu and 2.90% Zn; neither DDH hit significant mineralized rock; hosted in Triassic rocks.	S	P. Beardslee, oral commun.	L	M
59	Brushy Creek 0021170175 [PE033]	56.5203 -133.0165	OF	VMS: Zn, Pb, Ag	Cuts, soil grids	Samples contained up to 423 ppb Au, 33.9 ppm Ag, 9,824 ppm Pb, 2.6% Zn; hosted in Triassic rocks.	S	C. Rockingham, oral commun.	L	M
60	Olympic Resources Gold 0021170174	56.5200 -131.7600	OF	Unknown: Au	7DDH, Soil grids	Reported soil sample grid results of 1,150 ppb median Au value unverified by BLM sampling; two samples from silicified greenstone contained 94 and 730 ppb Au and >10,000 and 1,340 ppm As.	M, S	P. Beardslee, oral commun.; This study	L	L
61	Freel & Durham 0021170041 [PE012]	56.4192 -132.9518	OF	Unknown: Au	None	Stream sediment and quartz float samples lacked significant metal values.	S	Alaska Kardex 117-058	L	L
62	Road Show 0021170042	56.6675 -132.7109	OF	Placer: Au	None	Stream sediment, pan concentrate, and quartz float samples lacked significant metal values.	S	Alaska Kardex 117-079	L	L
63	December Point 0021170171 [PE013]	56.5485 -132.9587	OF	Vein: Sb	T	Reported structure-controlled stibnite; up to 13% Sb reported; BLM samples to 141 ppm Sb	NF	Roehm, 1945	L	L
64	Mitkof Island, FS Rd 6245 0021170173	56.5200 -132.7606	OF	MS: Cu, Pb, Zn	None	Sample of iron- and copper-stained rubblecrop in quarry contained 1,007 ppm Cu.	S	This study	L	L
65	Zarembo Island, FS Rd 52009 0021170160	56.4240 -132.9841	OF	Vein: Au	None	Sample of drusy quartz road fill with sulfides contained 546 ppb Au, and 826 ppm As.	S	This study	L	L
66	Frenchie 0021170055 [PE058]	56.4855 -132.0344	OF	VMS: Zn, Cu, Ag, Pb	Adit: 35; 8 DDH	460-ft long by 5 ft thick exposed sulfide band averages 0.047 oz/t Au, 0.42 oz/t Ag, 0.55% Cu, 0.08% Pb, and 1.48% Zn; hosted in Triassic rocks.	M, S	Brewer, 1979; Rockingham, 1996	L	H
67	Lost Zarembo 0021170152 (aka Spiderman) [PE062]	57.3267 -133.0850	OF	VMS: Zn, Cu, Pb, Ag	None	Three conformable bands of massive sulfide exposed for 45 ft in wall of rock quarry contain up to 27.6 ppm Ag, 3,781 ppm Cu, 3,567 ppm Pb, 4.92% Zn, and 29.3% Ba; hosted in Triassic rocks.	S	DeLancey, 1990	L	M

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68	Gallavantin 1-3 0021170057 (Zarembo Island Hornblendite) [PE066]	56.4181 -132.6279	OF	Mag Seg: Cu	None	The best sample from iron-stained hornblendite with pyrrhotite and chalcopyrite contained 2,760 ppm Cu, 10 ppb Pt, and 28 ppb Pd.	S	Alaska Kardex 117-081	L	L
69	Zarembo Island Fluorite 0021170053 [PE060]	56.2705 -132.9312	OF	Vein: F, REE?	None	Samples collected from geodes, silicified zones, and fluorite contained up to 291 ppb Au, 1,768 ppm barium, and 38 ppm lanthanum.	S	Van Alstine and Berryhill, 1963	L	L
70	ZF 0021170132	57.3300 -132.8900	OF	Unknown	None	One sample collected; sample lacked significant metal values.	S	BLM, ALIS	L	L
71	Round Point 0021170133 (aka Zarembo Island) [PE063, PE064]	56.2808 -132.7035	OF	VMS: Cu, Zn, Ag	2 DDH, soil grids	Samples across 0.1 to 0.9-ft thick sulfide band contained up to 55 ppm Ag, 2.1% Cu, and 1.1% Zn.	S	DeLancey, 1990	L	M
72	Shrubby Island 0021170155	56.2385 -132.9835	OF	PR: Zn, Pb	None	One- to two-ft pods of pyrite with sphalerite and galena in limestone; up to 8.1% Zn & 3,646 ppm Pb over 0.5 ft, and 1.3% Zn over 2.1 ft.	S	Cathrall & others, 1983; Smith, 1998	L	L
73	Exchange 0021170017 [PE067]	56.4213 -132.5330	OF	Vein: Au	Adit: 45; Cuts	16-ft thick quartz vein; best 5 ft of vein contained 923 ppb Au	S	Wright and Wright, 1908	L	L
74	Sunrise 0021170056	56.4187 -132.5297	OF	Placer: Au	None	Stream sediment and pan concentrate samples did not contain significant metal values.	S	Alaska Kardex 117-082	L	L
75	Keating Range 0021170136 [PE072]	56.9218 -134.1165	OF	Unknown	None	47-claim block staked by MAPCO in 1978; samples of iron-stained zones in volcanic rocks lacked significant metal values.	S	Alaska Kardex 117-096	L	L
76	Mosman Inlet 0021170154	56.3927 -131.1112	OF	Skarn: Zn, Au, Cu	None	Samples across a narrow malachite-stained tactite zone contained up to 1,481 ppb Au, 35.4 ppm Ag, 3,635 ppm Cu, and 585 ppm Zn; a 3-ft wide tactite zone reported to contain 9.5% Zn was not found.	S	Pittman, 1962	L	L
77	Steamer Bay 0021170068 (aka Plumb 1-26) [PE073]	56.1370 -132.6564	OF	PV: Zn, Pb, Cu, Ag	None	A sample of silicified breccia stream float contained 10.9.ppm Ag, 1,407 ppm Cu, 1.01% Pb, and 1.9% Zn.	S	Alaska Kardex, 117-078; P. Pieper, oral commun.	L	L

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78	Obsidian 0021170060 [PE069]	56.5213 -132.9954	OF	Unknown: Au?, W?	None	Stream sediment and rock samples from the area of the reported occurrence contained up to 784 ppm Zn, but lacked other significant metal values.	S	Roehm, 1940; Alaska Kardex 117-073	L	L
79	Salamander Creek Pit 0021170159	56.3063 -132.2250	OF	Skarn: Cu	None	Iron-stained contact zone between biotite granite, and schist and slate exposed in borrow pit; samples contained up to 227 ppm Cu, 17 ppm Mo.	S	D. Brew, written commun.	L	L
80	Bruiser 0021170065 [PE075]	56.1059 -132.0774	OF	Vein: Au?, W?	None	Quartz stringers up to 4 ft thick did not contain significant metal values.	S	Alaska Kardex 117-065	L	L
81	Niblack Island 0021170066 [PE077]	56.6496 -133.0249	OF	P?: Cu	None	Sample of granite contained 1,725 ppm Cu.	S	Alaska Kardex 117-003	L	L
82	K & D Mine 0021150006	56.8058 -133.9503	OF	Vein: Au, Sb, Ag	3 Adits: (8; 6; 145); Shaft: (38)	Quartz vein up to 25 ft thick; exposed for about 1,000 ft; Best sample contained 0.757 oz/t Au, >50 ppm Ag over 2.3 ft.	M, S	Williams, 1951; WGM, 1992	L	L
83	Louise Group 0021150011	56.5503 -133.0268	OF	PR: Cu	2 Adits: 248, 60	Lenses and disseminations of chalcopyrite and pyrrhotite in quartz-biotite gneiss near faulted contact with amphibolite; grab sample contained 4,899 ppm Cu; averages at 0.1% Cu across width of adit.	M, S	Buddington 1925; Port Houghton/Cape Fanshaw EIS, 1995	L	L
84	Sun 1-2 0021150016	57.3316 -132.9129	OF	PV; Au, Ag, Pb, Zn	1 DDH, Cut	Cut exposes 0.1 by 11-ft band of massive galena and sphalerite; sample across band contains 1,411 ppb Au, 36.3 oz/t Ag, 9.99% Pb, and 7.1% Zn.	S	Alaska Kardex 115-058	L	L
85	The Islander 0021150005	57.2676 -133.5119	OF S	Vein: Au, Zn	None	Quartz-calcite stringers with pyrite and sphalerite up to 12 inches wide and 19 ft long contain up to 1.077 oz/t Au and 9.7% Zn.	S	Williams, 1952	L	L
86	Bay Point 0021150070	57.1183 -133.2707	OF	VMS: Au, Cu, Pb, Zn	Soil sample grid	Prospected by Hecla Mining Co. in 1991-92 with geologic mapping and soil grids; gold-copper VMS in Jurassic-Cretaceous Gravina Belt.	S	Jones, 1990; Anderson, 1991	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
87	Colp and Lee 0021150020 [PE015]	57.1042 -132.8022	OF	Unknown: Au?	None	Au reported in quartz stringers in 140-ft shear zone; reported to $16/ton Au in richest 5.5 ft of zone.	S	Buddington, 1923	L	L
88	Cascade 0021170010 [PE042]	56.9918 -132.7890	OF	Vein: Au	2 Adits: 79, 21; 1 T	Samples from 1989 examination contained up to 0.22 oz/t Au; samples from this study contained up to 589 ppb Au.	S	Maas and Redman, 1989	L	L
89	Dave's Dream 0021170192 [PE016]	56.5485 -132.9587	CF	Placer: Au	3 Pits	Pan concentrate and stream sediment samples from pits and streams did not contain significant gold.	S	This study	L	L
90	Mary Moose 0021170030	56.6671 -132.2380	CF	Placer: Au	None	Stream sediment samples contained up to 29 ppb Au.	S	This study	L	L
91	Buck Bar 0021170033	56.7059 -132.0639	CF	Placer: Au	None	Stream sediment and pan concentrate samples contained up to 80 ppb Au.	S	Brooks, 1923	L	L
92	Andrew Creek 0021170161	56.5694 -132.1051	CF	Vein?: Au	None	Quartz float samples contained up to 0.822 oz/t Au; source of gold not discovered.	S	This study	L	L
93	North Silver North 0021170165	56.5228 -132.0417	OF	PV, Skarn: Ag, Pb, Zn	7 DDH, T's	Samples from narrow pinch-and-swell quartz-sulfide veins contained up to 119.32 oz/t silver, 48.61% Pb, and 4.1% Zn; samples from mineralized marble beds contained up to 58 ppm Ag, 5.16% Pb and 6.4% Zn.	M, S	Bunker Hill Company, 1965	L	H
94	North Silver West 0021170166	56.5154 -132.0439	OF	PV: Ag, Pb, Zn	4 Pits	Samples 0.5 to 4.9 ft long from a pinch-and-swell quartz-sulfide vein contained up to 79.46 oz/t Ag, 33.47% Pb, and 9.8% Zn.	M, S	This study	L	M
95	North Silver Whistlepig Adit 0021170167 [PE043]	56.5195 -132.0514	OF	PV: Ag, Pb, Zn	Adit, Cuts	Samples from narrow pinch-and-swell quartz-sulfide veins contained up to 4,345 ppb Au, 517.62 oz/t Ag, 39.75% Pb, and 11.0% Zn.	S	This study	L	H
96	AMAX Molybdenum 0021170045 (aka Moly 1-12)	56.5187 -132.0607	OF	P: Mo	4 DDH	Molybdenite on fracture coatings spatially associated with a 16.3 million year old biotite granite stock; DDH results indicate subeconomic Mo concentrations.	S	Amax Exploration Inc., 1981	L	L
97	Northeast Cliffs 0021170168	56.8884 -133.3666	OF	PV: Zn, Sn	None	Disseminated sulfides in silicified gneiss and rhyolite; samples contained up to 9,559 Zn, 1,941 ppm Sn.	S	Amax Exploration Inc., 1981	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
98	Groundhog Basin 0021170018 [PE040]	56.9988 -133.8633	OF, P: (MS 1580)	PR: Zn, Pb, Sn, Ag	4 Adits; 27 DDH	466,000 tons indicated and inferred resources that average 4 ft thick, 8% Zn, 2.5% Pb, 2 oz/t Ag, and 0.39% Sn.	M, S	Muir, 1943; Oliver, 1984	L	M
99	Copper Zone 0021170163	56.8810 -134.0736	OF	P: Cu, Zn	9 DDH	Surface sampling indicates a125 by 160 ft. zone that averages 0.11% Cu; a 70-ft drill intercept through this zone also averaged 0.11% Cu and contained from 135 to 6,650 ppm Zn.	M, S	George and Wyckoff, 1973	L	L
100	South Silver 0021170169	56.5071 -132.0387	OF	PV: Zn, Pb, Ag	1 DDH	Samples from quartz vein/stringer zone up to 10 ft thick contained up to 63.9 ppm Ag, 1,417 ppm Zn, and 1,089 ppm tin	M, S	George and Wyckoff, 1973	L	L
101	Camp 6 Area 0021170162 [PE043]	56.5028 -132.0417	OF	PV: Zn, Ag	None	Samples from shear zones contained up to 58 ppm Ag, 1,976 ppm Cu, 1,324 ppm Pb, and 9.5% Zn.	M, S	George and Wyckoff, 1973	L	L
102	Lake Cirque 0021170164	56.9055 -134.1317	OF	PR: Zn, Pb, Sn	None	Three areas of mineralized rock discovered near retreating ice; east zone averages 2.4 ft wide, is exposed for 500 ft, and averages 8,374 ppm Pb, 5.13% Zn, and 842 ppm Sn.	M, S	This study	L	M
103	North Marsha Peak 0021170158	56.4928 -132.0431	OF	PV: Zn, Pb	3 DDH, T's	Westernmost shear is 4 to 12 ft wide and averages 1.5 oz/t Ag, 0.3% Cu, 0.22% Pb, and 0.58% Zn; samples across the easternmost shear from 3.2 to 4.4 ft long contained up to 72 ppm Ag, 2,454 ppm Cu, 4.95% Pb, and 18.74% Zn.	M, S	George and Wyckoff, 1973	L	M
104	East Marsha Peak 0021170156	56.5579 -133.0090	OF	PV: Zn, Pb	4 T's	Shear zone up to 30 ft wide averages 3.19% Zn, 1.67% Pb and 1.99 oz/t Ag; its projected intersection with Huff marble under Nelson Glacier is of exploration interest.	M, S	George and Wyckoff, 1973	L	H
105	Nelson Glacier 0021170157 [PE043]	56.0522 -132.0992	OF	PR?, Skarn: Ag, Pb, Zn	2 DDH	The intersection of the East Marsha Peak mineralized shear and the Huff Marble is projected under the Nelson Glacier	S	Humble Oil and Refining Co.,1970a, 1970b	L	M
106	West Nelson Glacier 0021180146	56.4786 -131.9971	OF	PV: Pb, Ag, Zn	None	A 0.2-ft sample across the best sulfide mineralization contained 4.39 oz/t Ag, 2.70% Pb, 9,577 ppm Zn.	S	This study	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
107	Huff 0021180069 [BC001]	56.8894 -134.0722	OF	PV, Skarn: Pb, Zn, Ag	2 DDH	300-ft section of a 20-ft thick marble bed is erratically mineralized with sulfides; a 7-ft sample of the better mineralization assayed 0.62% Cu, 6.8% Zn, 20.08% Pb, 2.9 oz/t Ag.	M, S	George and Wyckoff, 1973	L	H
108	Glacier Basin 0021170020 [PE041]	56.5147 -132.0621	OF	PV, PR: Zn, Pb	2 Adits: 40, ?	Inferred resource of Amany hundreds of thousands of tons of pyroxene granulite@ that average 1.66% Zn and 1.09% Pb.	S	Gault and others, 1953; Berryhill, 1964	L	L
109	Lake 0021170019 [PE038]	56.5031 -132.0530	OF	PV: Pb, Zn, Cu, Ag	2 Adits: 20, 235, (?); Pits, Cuts	Sulfide mineralized fault zone exposed by adits and cuts for 1,450 ft; samples contained up to 4.73 oz/t Ag, 25.1% Pb and 16.4% Zn.	S	Buddington, 1926	L	M
110	Berg Basin 0021170021 [PE042]	56.4469 -132.0100	OF	PV: Au?, Ag, Pb	Adit: 840; 2 DDH, Pits	Gold-bearing quartz vein and galena-sphalerite lenses reported; neither intersected in adit or DDH's.	S	Ray, 1953	L	M
111	Copper King 0021180014 [BC002]	56.5046 -132.0486	OF	PV: Zn, Cu, Ag	Shaft-flooded; 1 T	Up to 4.5-ft thick quartz-sulfide vein hosted in rhyolite; 0.7-ft sample contained 18.9 ppm Ag, 5,639 ppm Cu, 2.10% Zn	S	Williams, 1957	L	L
112	Berg 0021180068 [BC003]	56.3889 -131.9571	OF	Unknown: Au?	None	Prospect searched for, but not found.	NF, R	Alaska Kardex 118-004	L	L
113	Cone Mountain 0021180070 (aka Pat) [BC004]	56.4394 -131.9653	OF	Unknown: U_3O_8, REE	None	A sample contained 1,740 ppm cerium, 954 ppm lanthanum, 440 ppm neodymium, 60 ppm samarium, 72.6 ppm thorium, and 2,098 ppm Mo.	S	Elliott and Koch, 1981; Alaska Kardex 118-091	L	L
114	Black Crag 0021180147	56.5463 -131.6774	OF	P: Mo, REE	DDH?	Molybdenite fracture coatings in quartz porphyritic rhyolite and silicified felsite float; samples contained up to 2,529 ppm Mo and REE.	S	P. Pieper, oral commun.	L	M
115	Craig River 0021180141	56.4641 -131.3557	OF	Skarn: Cu, Mo	None	Select samples of skarn contained 1,781 ppm Cu and 478 ppm Mo.	S	Koch, 1997	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
116	Craig Claims 0021180143 [BC010]	56.4526 -131.2372	OF	Skarn: Cu, Zn	None	Samples of sulfide in skarn contain up to 5,706 ppm Cu, 3.1% Zn; also disseminated and layered pyrite and pyrrhotite in schist and gneiss with low metal contents.	S	Alaska Kardex 118-92; Elliot and Koch, 1981	L	L
117	North Bradfield River Skarn 0021180049 [BC009]	56.4928 -132.0431	OF	Skarn: Fe, Cu	T's, DDH, Adit?	Area contains 1 million tons of proven and probable resources and 4,481,000 tons of possible resources that grade 35-40% Fe and 0.2 to 0.3% Cu.	M, S	Utah Construction, 1960	L	M
118	Mt. Lewis Cass 0021180144	56.2026 -131.6294	OF	P: Mo, Cu	None	Samples from quartz stringers in granodiorite contained up to 1,558 ppm Mo; float samples contained up to 1.3% Cu.	S	This study	L	L
119	Upper Marten Lake 0021180145	56.2871 -131.7900	OF	PV: Au, Ag, Pb	None	A sample from a fault zone in schist with quartz stringers contained up to 475 ppb Au, 86.9 ppm Ag, 1,218 ppm lead.	S	Koch and Elliot, 1981	L	L
120	Bradfield Canal Shear 0021180142	56.2026 -131.6294	OF	PV: Au, Ag, Cu	Cut	One-ft wide quartz vein extends about 40 feet; low precious and base metal values.	S	Roehm, 1942	L	L
121	Bradfield River 0021180073	56.2350 -131.4525	OF	Placer: Fe	None	Magnetite-rich black sands at the mouth of the Bradfield River; 12 samples averaged 9% Fe; highest grade sample about 55% Fe.	S	Alaska Kardex 118-087	L	L
D1	ABC 0021160032	56.2912 -132.8069	OF	Unknown: Au	None	None	NE	Alaska Kardex 116-030	L	L
D2	Hurc 0021160058	56.9083 -134.1917	OF	Vein: Ba	None	16 claims active 1976-78; reportedly staked for Zn and Pb in sulfides; possibly drilled by Mapco in 1979.	NE	Alaska Kardex 116-037	L	L
D3	Hope 0021160039	56.1500 -132.0300	OF	Unknown: Ba	None	Witherite and barite veins; 3 claims staked in 1953.	NE	Alaska Kardex 116-002F	L	L
D4	Katherine Whitfield 0021160037 aka Katherine	57.4851 -133.5116	OF	Unknown: Ba	None	Witherite and barite veins; 1 claim staked in 1953.	NE	Alaska Kardex 116-001G	L	L
D5	Battleship Island 0021160040	56.3600 -132.2900	N	Unknown: Ba	None	Claims active in 1923, 1931, 1953, 1955, and 1977-78; probably a vein occurrence.	NE	Alaska Kardex 116-001E	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
D6	Allied Mine Group C 0021160036	56.5400 -132.0200	N	Unknown: Ba	None	Staked in 1953, probably on witherite and barite veins; no known activity since.	NE	Alaska Kardex 116-002C	L	L
D7	BJB 0021170130 [PE004]	56.9500 -134.1300	OF	Unknown	None	Held by Nerco Exploration Co. 1978 to 1982 – at least 30 claims.	NE	Alaska Kardex 117-090; BLM, ALIS	L	L
D8	Kupreanof Mountain 0021170082	56.9100 -134.1400	CF	PR: Cu	None	Block-staked area in late '70's early '80's, north of Northern Copper prospect – VMS target(?)	NE	Alaska Kardex 117-088	L	L
D9	Upper Duncan Canal 0021170131 [PE007]	56.8291 -133.3167	CF, OF	PR, VMS: Cu, Pb, Zn	DDH, soil grids	Refers to a number of prospects worked by Amoco Minerals Co. during 1978 and 1979; includes the Salt Chuck and Northern Copper prospects	S	Zelinski, 1979; Amoco Minerals Co., 1979	L	L
D10	Portage Mountain Group 0021170012 [PE009]	56.8763 -133.2431	CF	Vein?: Au, Ag, Cu	Adit(?): 130; Cuts	Reported quartz-calcite veins in slate and greenstone; associated with Cretaceous diorite.	NF	Roehm, 1945; Wright & Wright, 1908	L	L
D11	Lemke No. 1 0021170037 [PE011]	56.2500 -131.4200	N	Unknown: Fe, Ag, Au	None	Staked in 1960; active through 1962.	NE	Alaska Kardex 117-059	L	L
D12	Silver Bell 1-2 0021170036	56.2115 -132.6743	OS?	Unknown: U_3O_8	None	Staked in 1956; a 10-ft excavation is reported in Petersburg recorder's office records	NE	Alaska Kardex 117-020	L	L
D13	West Wrangell Narrows 0021170075	56.7200 -132.9500	OF, OS, MCO	Unknown: Cu	Adit(?): 200	A copper property with 200-ft adit is reported; location too vague to find.	NF	Alaska Kardex 117-047; Brooks, 1915	L	L
D14	Panacea 0021170043	56.3800 -132.5600	OF	Placer: Au	None	Staked in 1972; active through 1974.	NE	Alaska Kardex 117-080	L	L
D15	Treasure Island 0021170059 [PE068]	56.4311 -132.4708	CF	Unknown: U_3O_8	None	Staked in 1955.	NE	Alaska Kardex 117-004	L	L
D16	Lucky Lady 0021170058	56.8200 -133.0300	OF	Unknown	None	Staked in 1956; no commodity given.	NE	Alaska Kardex 117-022	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
D17	Quiet Harbor 0021170134 [PE071]	56.6700 -132.7100	OF	Skarn(?)	None	Skarn mineralization exposed on a nearby logging road.	NE	Alaska Kardex 117-095	L	L
D18	Zimovia 4-5 0021170067 [PE076]	56.2000 -131.5600	CF	Unknown: U_3O_8	None	Staked in 1956; no known activity since.	NE	Alaska Kardex 117-027	L	L
D19	Aurora 1 & 2 0021170061 [PE070]	56.9300 -134.0900	OF	Unknown: Fe	None	Staked in 1960; assessment work recorded in 1662, 1966, & 1968.	NE	Alaska Kardex 117-061	L	L
D20	Fools Inlet 0021170031	56.5000 -132.2500	OF	Unknown	None	AMAX Exploration Inc. staked 1 claim in 1976; no additional recorded activity.	NE	Alaska Kardex 117-086	L	L
D21	Jerry 0021150010	56.8900 -134.1700	OF	Unknown: Au?	None	Thin barren quartz stringers found in creek bank.	R	Alaska Kardex 15-006	L	L
D22	Boone 0021150008	56.7600 -133.6400	N	Unknown: Au?	None	No significant gold in stream sediment sample from mouth of Libby Creek.	R	Alaska Kardex 115-001	L	L
D23	CB 1 & 2 0021150009	57.4817 -133.4645	OF	Vein: Au?	None	No evidence of workings; quartz float in the creek.	S	Alaska Kardex 115-005	L	L
D24	Kloss-Davis Group 0021150007	57.4590 -133.2570	OF	Unknown: Au, Ag	None	Reported trace Au and Ag in quartz veins.	NE	Alaska Kardex 115-0052; Nelson, 1935	L	L
D25	Admiral Group 0021150023	57.3300 -132.8900	OF	Unknown: Au	None	Site may be the same as Sun 1-2; location is not exact, but reported analysis of 30 oz/t Ag in a 4-inch vein.	S		L	L
D26	Calico No. 1 0021170076 [PE037]	57.4692 -133.5102	OS?	Placer: Au	None	1 claim staked in 1974; no additional recorded activity.	NE	Alaska Kardex 117-083	L	L
D27	Whistlepig Placer 1-16 0021170062	56.4788 -132.1406	OF	Placer: Sn	None	Stream sediment collected from inlet of Virginia Lake did not contain significant metal values (sample no. 594)	S	Alaska Kardex 117-071	L	L
D28	Whistlepig 0021170077 [PE041]	56.7200 -132.9500	OF	Unknown: Pb	None	The 200+ claims in the Groundhog Basin area were called the Whistlepig.	S	Alaska Kardex 117-063	L	L

Table A-1. Summary information for all mines, prospects, and occurrences

Map no.	Name MAS no. [ARDF no.]	Latitude Longitude	Land status	Deposit type	Develo pment	Remarks	BLM work	Select references	MDP	MEP
D29	Aching Back No. 1 0021170078	56.9200 -134.2100	OF	Unknown: Pb	None	Probably one of the Groundhog Basin area prospects but description too vague to identify.	NE	Alaska Kardex 117-064	L	L
D30	White River 0021180072 [BC006]	56.4700 -132.1400	OF	Unknown: Au, Ag, Cu	None	10 claims staked by El Paso Natural Gas Co. in 1969; BLM samples from area had 1,151 ppm Cu & 1,402 ppm Ni; no evidence of activity found.	NF?	Alaska Kardex 118-085	L	L
D31	Zimovia 0021180076 [BC008]	56.4800 -132.3500	OF	Unknown: U_3O_8	None	1 claim staked in 1956 by the Zimovia Mineral Co.; no recorded activity after 1957.	NE	Alaska Kardex 118-064	L	L
D32	KAB 0021180075	56.2200 -131.5000	OF	Placer: Fe	None	Samples averaged 9% Fe.	S	Alaska Kardex 118-075	L	L
D33	Last Chance 0021180074	56.8700 -133.3600	OF	Unknown: Au?	None	Staked in 1968; no record of activity since 1968.	NE	Alaska Kardex 118-081	L	L

APPENDIX B - ANALYTICAL RESULTS

SAMPLING AND ANALYTICAL PROCEDURES

Sampling methods

BLM personnel collected several types of rock samples during the process of evaluating mineral deposits in the Stikine area. **Channel** samples are rock fragments, chips, or dust from a continuous channel of uniform width and depth across an exposure. **Chip channel** samples are chips of rock taken in a continuous line across a relatively uniform width and depth of an exposure. **Continuous chip** samples are chips of rock taken in a continuous line across an exposure. **Representative chip** samples are discontinuous chips of rock taken across an exposure. **Spaced chip** samples are chips of rock taken at a specified interval across an exposure. **Random chip** samples are chips of rock taken randomly across an exposure. **Grab** samples are rock chips or fragments taken more or less at random from an outcrop, float, or mine dump. **Select** samples are rock chips collected from the highest-grade parts of a mineralized zone.

Stream sediment, soil, and pan concentrate samples are collected in reconnaissance fashion to detect any anomalous metal values that may indicate the presence of mineralized rock in an area. **Stream sediment** samples are collections of silt- and clay-sized particles taken from a stream bed. **Soil** samples are silt- and clay-sized particles taken from B and C soil horizons just above bedrock. **Pan concentrate** samples consist of one pan full of gravel, sand, and/or fines reduced by standard panning methods. The resultant concentrate of fines is then analyzed.

Analytical Methods

All analyses were conducted by a commercial laboratory. Rock samples were dried, crushed to a minus 10 mesh, split and pulverized to minus 150 mesh. Stream sediment samples were dried and sieved to a minus 80 mesh. Pan concentrate samples were pulverized to minus 150 mesh. For samples analyzed by inductively coupled argon plasma (ICP) and atomic absorption spectrophotometry (AA), a 0.5-gram sample was dissolved in aqua regia for measurement. For samples analyzed by X-ray fluorescence (XRF), a 10-gram pressed pellet was prepared for measurement. For samples analyzed by instrumental neutron activation analysis (INAA), a 5-gram vial was measured.

Samples were analyzed for gold by fire assay pre-concentration of a 30-gram sample followed by an AA finish with results reported in parts per billion. For gold values exceeding the upper detection limit of 10,000 ppb, a gravimetric finish was performed, and results were reported in ounces per ton.

Silver, copper, lead, zinc, and molybdenum were analyzed by AA with results reported in parts per million. Those samples of copper, lead, zinc, and molybdenum that exceeded the upper finish, with results reported in percent. Samples of silver that exceeded detection limits were reanalyzed with gravimetric determination by fire assay using lead as a collector, and results were reported in ounces per ton.

Platinum and palladium were analyzed by fire assay pre-concentration of a 30-gram sample and an ICP finish with results reported in parts per billion.

Barium was analyzed by XRF with results reported in ppm. Those samples exceeding the upper detection limits (20,000 ppm) were further analyzed by wet-chemical high-grade assay methods utilizing carbonate fusion digestion and measured by AA. This pressed-pellet method is preferred due to the incomplete dissolution of barite (BaSO4) by standard aqua regia and multiacid digestion methods used for ICP and AA analysis. For selected samples, tin and tungsten were also analyzed by XRF to improve the accuracy of data in areas where the BLM presumed a higher potential for these elements exists.

Rare-earth elements (Ce, Eu, La, Lu, Nd, Sc, Sm, Tb, Th, U, Yb) were analyzed by INAA with values reported in parts per million.

Mercury was analyzed by cold vapor AA methods with results reported in parts per million.

The remaining 24 elements were analyzed by ICP with results reported as either parts per million or percent. In most instances, when the results of samples analyzed by this method exceeded the upper detection limits, the samples were not reanalyzed, but results were reported as being greater than the corresponding upper detection limit. However, values above ICP detection limits were obtained for some samples using low-level assay methods consisting of a multiacid digestion and AA finish, with results reported in percent.

Reporting Methods

The site descriptions in this report contain select analytical results. These results are in the units reported by the laboratory and are dependent primarily on analytical methods used to analyze the sample. No attempt has been made to convert results into other units for either consistency or ease of understanding.

MINIMUM DETECTION LIMITS BY ANALYTICAL TECHNIQUE

Fire assay methods

Element	Minimum, ppm	Finish method
Au	0.005	atomic absorption (AA)
Au	0.17	gravimetric
Ag	0.7	gravimetric
Pd	0.001	inductively coupled argon plasma (ICP)
Pt	0.005	inductively coupled argon plasma (ICP)

X-ray fluorescence spectroscopy (XRF)

Element	Minimum, ppm
Ba	10
Sn	4
W	4

Instrumental neutron activation analysis

Element	Minimum, ppm	Element	Minimum, ppm
Ce	2	Sm	0.1
Eu	0.5	Tb	0.5
La	2	Th	0.5
Lu	0.1	U	1
Nd	5	Yb	0.5
Sc	0.1		

Atomic absorption spectrophotometry (AA)

Element	Minimum, ppm
Ag	0.1
Cu	1
Hg (cold vapor)	0.01
Mo	1
Pb	2
Zn	1

Inductively coupled argon plasma (ICP) spectroscopy

Element	Minimum, ppm	Element	Minimum, ppm
Al	0.01 %	Mn	1
As	5	Na	0.01 %
Bi	5	Nb	1
Ca	0.01 %	Ni	1
Cd	0.2	Sb	5
Co	1	Sc	5
Cr	1	Sn	20
Fe	0.01 %	Sr	1
Ga	2	Te	10
K	0.01%	Ti	0.01 %
La	1	V	1
Mg	0.01 %	W	20

ANALYTICAL RESULTS FOR SAMPLES FROM MINES, PROSPECTS, AND MINERAL OCCURRENCES AND FROM RECONNAISSANCE INVESTIGATIONS

Analytical and sample data are presented in tables B-1 to B-3. In addition to the analytical results, the following information is listed in the tables: prospect or reconnaissance map number, sample number, sample location, sample type, sample size, and a brief sample description. The results are organized by map number on the mines, prospects, and occurrences sample location map (pl. 1) and by reconnaissance map number on the reconnaissance investigation sample location map (pl. 2).

Units of measure

Results are recorded under the element's chemical symbol in the following units, except where noted by an asterisk (*). The results marked by asterisks were from samples whose concentrations of the corresponding element exceeded the limits of the analytical technique used for evaluation. These over-detection-limit samples were reanalyzed, using a different analytical technique with different units of measurement.

Au, Pt, Pd - parts per billion (ppb)

Ag, Cu, Pb, Zn, Mo, Ni, Co, As, Ba, Bi, Cd, Cr, Ga, Hg, La, Mn, Nb, Sb, Sc, Sn, Sr, Te, V, W - parts per million (ppm)

Al, Ca, Fe, K, Mg, Na, Ti - percent (%)

If followed by an asterisk, Au and Ag values are recorded in ounces per ton (oz/t) and Cu, Pb, and Zn are recorded in percent (%). Asterisks in the Ba, Sn, and W columns indicate XRF analyses.

Abbreviations

Sample types:

R	rock chip
SS	stream sediment
S	soil
PC	pan concentrate

***Collection method (Rock Chip)*:**

C	continuous chip
CC	chip channel
CH	channel
G	grab
RC	random chip
Rep	representative chip
S	select
SC	spaced chip

Sample size: Sample sizes are given in feet. The sizes of spaced chip samples are given by the overall size of the sample followed by the sample spacing (e.g., 10 feet @ 0.5-foot spacings).

Sample sites:

FL	float	TP	trench, pit, or cut
MD	mine dump	UW	underground workings
MT	mine tailings	OC	outcrop
RC	rubblecrop		

Sample descriptions:

@	at	int	intrusive
alt	altered	ls	limestone
amp	amphibolite/amphibole	mag	magnetite
ar	argillite	mg	medium-grained
aspy	arsenopyrite	meta	metamorphic
bt	biotite	mal	malachite
br	breccia/brecciated	mo	molybdenite
calc	calcareous	msv	massive
carb	carbonate	peg	pegmatite
cc	calcite	phy	phyllite
cg	coarse-grained	po	pyrrhotite
chl	chlorite/chloritic	porph	porphyry/porphyritic
cs	coarse	py	pyrite/pyritic
cp	chalcopyrite	qz	quartz
dissem	disseminated/disseminations	sed	sediment
dol	dolomite/dolomitic	ser	sericite
fel	felsic	sc	schist
fest	iron-stained	sil	silicified/siliceous
fg	fine-grained	sl	sphalerite
gn	galena	sulf	sulfide
gp	graphite/graphitic	vn(s)	vein(s)
gw	graywacke	volc	volcanic
gs	greenstone	w/	with
hbl	hornblende		

Table B-1. Analytical results of samples from mines, prospects, and occurrences

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
1.1	9604	Allied Mine Group E	R	C	0.1	OC	Pink barite pod in volcaniclastics	<5		0.2		360		<2		18		<1	3	11	0.06	<5
1.1	9605	Allied Mine Group E	R	C	0.4	OC	Barite-carb vn in volcaniclastics	<5		<0.1		82		<2		10		2	2	2	0.07	6
1.1	9606	Allied Mine Group E	R	Rep	1.4	OC	Barite vn in volcaniclastics	<5		<0.1		14		<2		11		<1	5	10	0.22	19
2.1	9622	Cornwallis Peninsula	R	G		OC	Ls w/ cg calc, limonite	<5		<0.1		12		74		489		6	4	1	0.04	11
2.1	9623	Cornwallis Peninsula	R	C	1	OC	Barite vns in coarse br	<5		<0.1		91		6		319		<1	<1	<1	0.03	19
2.2	167	Cornwallis Peninsula	R	G	0.3	OC	Fest volc w/ py, limonite, fg sl	<5		1.5		40		384		8382		20	15	10	0.32	158
2.3	155	Cornwallis Peninsula	R	SC	2@.5	OC	Barite vn w/ calcite	<5		0.5		86		134		116		2	1	2	0.13	10
2.3	156	Cornwallis Peninsula	R	G	0.4	FL	Conglomerate w/ py, trace sl	7		2.3		660		149		553		15	2	12	0.17	644
2.3	9612	Cornwallis Peninsula	R	C	2.3	OC	Barite vn w/ fg py	7		0.2		11		11		78		<1	2	<1	0.06	37
2.4	9611	Cornwallis Peninsula	R	Rep	0.6	OC	Ls w/ dissem sulf	<5		6.7		26		660		2	*	5	4	1	0.03	123
3.1	161	Keku Islet	R	C	4	OC	Basalt dike w/ sl ladder vns	6		1.9		153		15		8.80	*	<1	29	31	0.42	34
3.1	9617	Keku Islet	R	C	2.4	OC	Alt basalt dike w/ sl ladder veinlets	<5		1.8		191		36		6.00	*	1	20	17	0.24	29
3.1	9618	Keku Islet	R	C	4.3	OC	Alt basalt dike w/ sl ladder veinlets	<5		1.3		126		249		7773		2	39	35	0.79	14
3.1	9619	Keku Islet	R	C	3	OC	Alt basalt dike w/ sl ladder veinlets	<5		2.3		216		71		5.10	*	<1	44	34	0.29	80
3.1	9620	Keku Islet	R	C	6	OC	Alt basalt dike w/ sl ladder veinlets, py	<5		2.4		252		42		13.80	*	<1	43	31	0.23	26
3.1	9621	Keku Islet	R	C	2	OC	Alt basalt dike w/ sl ladder veinlets	<5		1.3		283		33		3.60	*	2	33	33	0.41	27
3.2	2614	Keku Islet	R	S	0.1	OC	Fractured & br basalt w/ sl along fractures	<5		3.1		200		600		13.50	*	<10	12	15	0.34	12
3.3	162	Keku Islet	R	C	1.75	OC	Basalt dike w/ sl stringers	<5		1.0		276		6		6.10	*	<1	31	26	0.28	7
3.3	163	Keku Islet	R	C	0.07	OC	Sl veinlet in basalt	<5		2.2		179		9		14.20	*	<1	32	22	0.31	55
3.3	164	Keku Islet	R	C	0.6	OC	Basalt w/ sl vn	<5		2.5		166		8		31.17	*	<1	39	23	0.21	67
3.3	165	Keku Islet	R	C	0.07	OC	Basalt w/ sl vn	<5		3.6		181		23		10.90	*	<1	34	28	0.30	32
3.3	166	Keku Islet	R	C	0.1	OC	Basalt w/ sl vn	<5		1.3		115		6		8.60	*	1	15	16	0.30	6
4.1	151	Saginaw Bay	R	G	0.3	FL	Cherty, sil boulder w/ bands of py & gray sulf	<5		0.5		9		71		67		4	3	<1	0.26	465
4.1	152	Saginaw Bay	R	G	0.3	FL	Chert w/ bands & blebs of py	<5		<0.1		4		9		36		<1	2	<1	0.33	11
4.1	153	Saginaw Bay	SS					<5		0.2		13		26		168		2	8	14	2.05	23
5.1	159	Little Creek	SS					6		0.8		11		401		76		2	3	10	2.48	6
5.1	160	Little Creek	R	G	0.4	RC	Rhyolite w/ jasper	<5		<0.1		6		22		101		<1	4	<1	0.29	9
6.1	9578	Kuiu	R	S		TP	Dol w/ gn & sl	<5		21.72	*	428		20.54	*	13.40	*	8	2	1	0.11	19
6.1	9615	Kuiu	R	S		TP	Dol w/ gn & black manganese oxide alt	10		313.6		187		10.31	*	7.70	*	3	2	1	0.10	11
6.1	9616	Kuiu	R	RC		OC	Alt rhyolite	<5		1.6		4		302		287		<1	4	<1	0.30	7
7.1	9613	Katherine	R	Rep	1.5	OC	Barite stringers w/ minor gn in ls	<5		12.9		218		2355		3.20	*	2	7	9	0.05	44
7.2	157	Katherine	R	G	0.5	RC	Vuggy, drusy qz vn w/ py & gray sulf	31		9.5		55		371		748		17	48	29	0.13	2725
7.2	9614	Katherine	R	Rep	1	OC	Sil zone w/ drusy qz, py	62		9.6		49		605		735		14	38	13	0.12	1602
8.1	9577	Hungerford	R	G	1.2	OC	Br w/ barite, gn, sl, jasper, chert	<5		5.82	*	25		2.84	*	2228		2	3	5	0.08	<5
8.2	154	Hungerford	R	RC	15	OC	Amygdaloidal basalt w/ py & wisps of gray sulf	12		84.7		24		2.23	*	7028		2	3	3	1.17	<5
8.2	158	Hungerford	R	G	0.6	OC	Conglomerate w/ barite, sl	<5		16.4		11		5625		6019		<1	3	4	0.49	7
9.1	9608	Corn	R	G	2	OC	Sil rhyolite w/ scattered fg gray sulf	<5		1.6		12		86		32		2	3	<1	0.18	54
9.1	9609	Corn	R	G		OC	Sil rhyolite w/ scattered fg gray sulf	<5		2.7		11		194		423		6	3	<1	0.20	66
9.1	9610	Corn	R	G		FL	Barite w/ sl, gray sulf	<5		11.0		1959		1691		1.50	*	71	3	3	0.07	449
10.1	3874	Skate Creek	R	G		FL	Sil br w/ py, gray sulf	<5		2.1		169		91		295		29	7	6	0.03	176
10.2	3873	Skate Creek	R	G		FL	Sil br w/ sl, py, gray sulf	6		7.9		685		111		5.50	*	25	4	4	0.05	70
10.3	3872	Skate Creek	R	G		FL	Sil br w/ py, sl	<5		12.9		1093		370		8.10	*	68	8	8	0.03	333
10.4	3878	Skate Creek	R	S		FL	Sil br w/ msv sulf	8		5.4		1033		102		11.80	*	90	8	19	0.15	460
10.5	3879	Skate Creek	R	SC	16@1	OC	Volc br w/ dissem sulf	<5		2.0		48		97		4344		15	6	4	0.17	90
10.6	3880	Skate Creek	R	SC	16@1	OC	Volc br w/ dissem & msv sulf	<5		2.9		50		156		3306		11	9	11	0.17	134
10.7	8768	Skate Creek	R	SC	12@.5	OC	Sil br	6		1.4		41		64		707		7	7	6	0.37	174
10.8	3881	Skate Creek	R	C	2.0	OC	Barite-rich volc br w/ sulf	<5		0.7		311		24		121		13	4	2	1.06	58
10.9	8769	Skate Creek	R	SC	6.5@.5	OC	Sil br	<5		0.4		16		35		146		<1	5	4	0.83	53
10.10	3882	Skate Creek	R	SC	10@1	OC	Alt volc br w/ dissem sulf	<5		1.1		116		53		358		21	7	6	0.16	63

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
1.1	9604	Allied Mine Group E	**40.91%**	*	<5	4.68	<0.2	7	2.36	<2	0.238	0.02	9	1.05	2569	0.02	<1	<5	<5	<20		674	<10	<0.01	12	<20			
1.1	9605	Allied Mine Group E	**35.92%**	*	<5	4.53	<0.2	25	0.69	<2	0.210	0.05	4	0.23	536	0.01	<1	<5	<5	<20		1410	<10	<0.01	7	<20			
1.1	9606	Allied Mine Group E	**31.06%**	*	<5	0.25	<0.2	29	2.07	<2	0.186	0.13	6	0.12	736	0.05	<1	<5	<5	<20		761	<10	<0.01	21	<20			
2.1	9622	Cornwallis Peninsula	308	*	<5	39.79	4.7	2	0.86	<2	0.356	0.02	2	0.28	1113	0.03	5	<5	<5	<20		302	<10	<0.01	3	<20			
2.1	9623	Cornwallis Peninsula	**48.47%**	*	<5	2.24	1.3	4	0.72	<2	0.727	0.02	6	0.97	1467	0.02	<1	9	<5	<20		415	<10	<0.01	<1	<20			
2.2	167	Cornwallis Peninsula	12805	*	<5	0.19	20.6	35	11.89	5	11.391	0.26	4	0.03	150	0.03	<1	28	6	<20		28	<10	<0.01	30	<20			
2.3	155	Cornwallis Peninsula	**28.30%**	*	<5	6.83	1.1	12	2.96	2	0.179	0.05	166	3.04	6207	0.01	1	<5	<5	<20		741	<10	<0.01	4	<20			
2.3	156	Cornwallis Peninsula	**8.40%**	*	<5	4.02	3.4	31	16.78	5	3.684	0.06	<1	1.75	3366	0.02	<1	69	<5	<20		58	<10	<0.01	2	<20			
2.3	9612	Cornwallis Peninsula	**44.46%**		<5	0.97	0.7	20	2.28	<2	2.464	0.02	22	0.44	757	0.01	<1	<5	<5	<20		1180	<10	<0.01	<1	<20			
2.4	9611	Cornwallis Peninsula	**5.72%**	*	<5	25.26	149.8	19	1.74	<2	1.551	0.01	2	0.28	992	0.02	3	22	<5	<20		139	11	<0.01	1	<20			
3.1	161	Keku Islet	980	*	<5	3.11	608.1	51	2.87	8	7.320	0.31	<1	0.13	863	0.05	<1	8	16	<20		42	33	<0.01	92	83			
3.1	9617	Keku Islet	878	*	<5	3.23	411.5	48	1.46	7	4.185	0.25	3	0.05	506	0.03	<1	<5	8	<20		51	25	<0.01	56	64			
3.1	9618	Keku Islet	843	*	<5	6.30	46.5	27	6.14	2	0.451	0.23	5	0.45	2989	0.12	<1	<5	26	<20		89	<10	0.05	162	<20			
3.1	9619	Keku Islet	903	*	<5	1.40	345.1	52	8.00	7	3.706	0.23	2	0.19	1014	0.05	<1	14	12	<20		20	22	<0.01	73	54			
3.1	9620	Keku Islet	475	*	<5	2.18	1025.4	49	4.00	13	10.363	0.21	2	0.03	451	0.03	<1	10	9	<20		31	37	<0.01	42	149			
3.1	9621	Keku Islet	1089	*	<5	5.63	248.8	31	3.30	5	2.823	0.31	4	0.16	1277	0.05	<1	<5	24	<20		63	19	<0.01	101	35			
3.2	2614	Keku Islet	30		4	6.21	>100.0	22	1.34	10	11.490	0.30	<10	0.05	1005	0.04		10	12			59		<.01	29	<10			
3.3	162	Keku Islet	1088	*	<5	6.37	355.1	31	1.26	5	3.780	0.25	<1	0.04	1505	0.04	<1	<5	17	<20		74	22	<0.01	35	58			
3.3	163	Keku Islet	343	*	<5	7.58	733.5	27	1.86	10	10.937	0.21	<1	0.04	1776	0.04	1	10	16	<20		101	35	<0.01	38	131			
3.3	164	Keku Islet	218	*	<5	3.17	1798.1	14	3.45	26	22.585	0.16	<1	0.04	930	0.03	<1	18	7	<20		49	43	<0.01	33	254			
3.3	165	Keku Islet	654	*	<5	5.37	623.1	26	1.69	9	7.447	0.23	<1	0.03	1227	0.03	<1	8	18	<20		68	32	<0.01	54	101			
3.3	166	Keku Islet	770	*	<5	5.61	524.9	25	1.12	6	5.813	0.25	<1	0.04	1219	0.04	<1	6	12	<20		58	26	<0.01	32	77			
4.1	151	Saginaw Bay	2256	*	<5	0.14	<0.2	73	11.80	5	0.525	0.19	29	0.03	232	<0.01	<1	123	<5	<20		21	<10	<0.01	4	<20			
4.1	152	Saginaw Bay	2227	*	<5	0.04	<0.2	70	4.19	4	0.266	0.27	43	<0.01	42	<0.01	<1	<5	<5	<20		9	<10	<0.01	2	<20			
4.1	153	Saginaw Bay	1079		<5	0.73	0.3	11	5.47	5	0.299	0.09	30	0.21	4010	0.02	1	<5	<5	<20		62	<10	0.03	45	<20			
5.1	159	Little Creek	176		<5	0.12	0.8	8	2.57	6	0.226	0.09	34	0.09	3890	0.02	<1	<5	<5	<20		8	<10	0.01	27	<20			
5.1	160	Little Creek	1359	*	<5	0.27	0.4	141	2.17	<2	0.088	0.17	48	0.10	582	0.07	2	<5	<5	<20		40	<10	<0.01	1	<20			
6.1	9578	Kuiu	3		<5	0.40	1057.4	25	11.50	<2	17.430	0.07	12	0.10	>20000	<0.01	<1	355	<5	<20		20	34	<0.01	<1	<20			
6.1	9615	Kuiu	2292	*	<5	1.39	546.0	30	14.74	11	12.849	0.02	13	0.21	**5.41%**	0.01	<1	221	<5	<20		27	26	<0.01	<1	70			
6.1	9616	Kuiu	1231	*	<5	<0.01	2.3	105	1.16	2	0.089	0.27	29	<0.01	1054	0.02	<1	<5	<5	<20		5	<10	<0.01	<1	<20			
7.1	9613	Katherine	**24.22%**	*	<5	14.60	133.8	4	2.60	<2	23.144	0.02	<1	3.09	2879	0.01	2	44	<5	<20		71	15	<0.01	26	29			
7.2	157	Katherine	8498	*	<5	0.10	0.6	43	30.70	6	6.185	0.02	<1	0.02	74	0.01	<1	377	<5	<20		6	<10	<0.01	5	<20			
7.2	9614	Katherine	7107	*	<5	0.56	1.3	96	16.19	4	3.618	0.04	<1	0.22	347	0.02	<1	206	<5	<20		5	<10	<0.01	3	<20			
8.1	9577	Hungerford	70		<5	0.65	49.8	24	7.14	<2	34.460	0.06	5	0.31	15162	0.02	<1	72	<5	<20		705	<10	<0.01	<1	<20			
8.2	154	Hungerford	4014	*	<5	5.08	123.4	15	4.10	6	6.911	0.40	34	0.38	8800	0.03	1	27	8	<20		101	<10	<0.01	20	<20			
8.2	158	Hungerford	14.60%	*	<5	1.43	53.4	37	4.48	3	6.768	0.25	10	0.48	6880	0.03	<1	<5	6	<20		464	<10	<0.01	11	<20			
9.1	9608	Corn	14625	*	<5	0.06	0.3	72	6.94	2	0.407	0.18	3	<0.01	15	<0.01	<1	10	<5	<20		22	<10	<0.01	<1	<20			
9.1	9609	Corn	**5.49%**	*	<5	<0.01	5.0	70	4.89	2	0.818	0.19	5	<0.01	75	<0.01	<1	16	<5	<20		58	<10	<0.01	<1	<20			
9.1	9610	Corn	**28.41%**	*	<5	2.39	117.8	36	1.35	<2	3.070	0.04	21	0.03	543	<0.01	<1	347	<5	<20		143	<10	<0.01	<1	<20			
10.1	3874	Skate Creek	**17.14%**	*	<5	0.08	1.2	129	4.85	<2	0.118	0.02	<1	0.02	122	<0.01	<1	17	<5	29	*	49	<10	<0.01	5	<20			
10.2	3873	Skate Creek	**25.07%**	*	<5	0.07	209.6	73	2.61	2	3.638	0.04	1	0.03	2745	<0.01	<1	15	<5	25	*	58	11	<0.01	4	39			
10.3	3872	Skate Creek	**11.24%**	*	<5	0.17	293.9	124	5.35	4	4.002	0.02	<1	0.08	6039	<0.01	<1	33	<5	68	*	34	15	<0.01	6	55			
10.4	3878	Skate Creek	**6.74%**	*	<5	0.28	796.4	115	4.26	6	10.660	0.09	2	0.12	304	<0.01	<1	20	<5	90	*	26	17	<0.01	6	76			
10.5	3879	Skate Creek	**2.60%**	*	<5	0.47	14.5	82	4.19	<2	0.781	0.23	25	0.21	4464	<0.01	<1	<5	<5	15	*	90	<10	<0.01	4	<20			
10.6	3880	Skate Creek	**3.90%**	*	<5	1.26	12.1	78	6.72	3	0.836	0.21	12	0.54	7058	0.01	<1	7	<5	11	*	77	<10	<0.01	6	<20			
10.7	8768	Skate Creek	20		<5	0.78	3.0	93	5.27	4	0.166	0.50	14	0.19	6528	0.01	<1	<5	<5	7	*	74	<10	<0.01	4	<20			
10.8	3881	Skate Creek	**26.87%**	*	<5	1.92	0.4	35	5.46	3	0.066	1.30	1	0.13	6650	0.02	<1	<5	<5	13	*	102	<10	<0.01	3	<20			
10.9	8769	Skate Creek	13		<5	1.40	0.3	60	7.59	6	0.050	0.95	3	0.30	6840	0.01	<1	<5	<5	<1	*	71	<10	<0.01	6	<20			
10.10	3882	Skate Creek	**3.64%**	*	<5	0.92	1.2	48	7.83	3	0.085	0.19	7	0.39	10024	<0.01	<1	<5	<5	21	*	54	<10	<0.01	5	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
10.11	3883	Skate Creek	R	SC	7@1	OC	Rhyolite tuff	<5		<0.1		3		9		35		4	4	1	0.22	19
10.12	8773	Skate Creek	R	SC	15@1	OC	Gray sil br, small barite crystals in matrix	<5		1.4		72		58		639		27	6	7	0.11	86
10.13	8774	Skate Creek	R	SC	9@1	OC	Sil br w/ sulf & barite	<5		1.2		24		68		1115		8	6	7	0.15	88
10.14	8770	Skate Creek	R	C	3	OC	Sil br, about 5% sulf	<5		2.2		233		66		6170		59	4	3	0.05	114
10.15	8771	Skate Creek	R	SC	6@.5	OC	Sil volc br, 2-3% sulf	<5		0.6		80		42		154		7	6	6	0.18	101
10.16	8772	Skate Creek	R	SC	8@.5	OC	Sil br, minor sulf	<5		0.4		14		22		54		9	5	4	0.16	53
10.17	8778	Skate Creek	R	SC	8@.5	OC	Sil br w/ dissem & vns of py	<5		3.0		245		56		5255		15	7	10	0.18	96
10.18	8780	Skate Creek	R	S		OC	Msv py in grayish-green groundmass	63		13.0		2495		552		685		133	15	78	0.44	2387
10.19	8777	Skate Creek	R	SC	8@.5	OC	Sil br w/ dissem py	<5		5.0		2075		119		11953		28	8	22	0.12	473
10.20	8779	Skate Creek	R	C	2	OC	Semi-massive py & cg barite in lens	21		31.8		4333		421		2.22	*	94	39	67	0.05	1564
10.21	3888	Skate Creek	R	SC	13@1	OC	Alt tuff w/ sulf	<5		0.9		75		29		449		21	9	7	0.17	78
10.22	3890	Skate Creek	R	S		OC	Sulf-rich part of alt volc	9		3.3		94		80		3358		67	18	73	0.15	2525
10.23	3889	Skate Creek	R	C	3.1	OC	Alt tuff w/ sulf, barite	<5		5.3		256		101		7207		21	7	16	0.18	405
10.24	3893	Skate Creek	R	Rep	0.5	OC	Sulf-rich zone in sil tuff	<5		14.9		279		1356		11.70	*	30	3	2	0.07	131
10.25	3891	Skate Creek	R	SC	11@1	OC	Sil tuff w/ minor sulf	<5		1.3		110		63		4187		11	4	3	0.14	126
10.26	3892	Skate Creek	R	SC	12@1	OC	Sil tuff w/ minor sulf	<5		0.3		103		17		149		15	5	3	0.29	69
10.27	8781	Skate Creek	R	SC	13@1	OC	Sil br w/ dissem and vns of py	<5		1.1		204		64		938		15	6	6	0.14	57
11.1	148	Saginaw Bay Barite	R	C	0.4	OC	Barite veinlet in ls	<5		<0.1		9		4		8		<1	3	2	0.04	<5
11.1	9607	Saginaw Bay Barite	R	Rep	2.4	OC	Cg bladed barite vn in ls	<5		<0.1		40		4		7		2	<1	<1	0.02	<5
12.1	174	Kadake Bay	R	C	0.1	OC	Carbonaceous fossils in shale	<5		0.3		51		22		264		20	14	15	1.02	18
12.1	175	Kadake Bay	R	C	0.3	OC	Carbonaceous bed in ls	6		<0.1		6		8		168		5	3	2	0.07	20
12.1	176	Kadake Bay	R	C	0.07	OC	Carbonaceous bed in ls	<5		<0.1		10		10		114		5	5	5	0.17	6
12.1	9627	Kadake Bay	R	C	1	OC	Carbonaceous fossil seams in mg qz arenite	<5		<0.1		8		22		121		9	5	5	0.18	6
13.1	9625	Kuiu 1-9	SS					24		<0.1		10		22		60		3	6	5	1.07	9
13.1	9626	Kuiu 1-9	SS					6		<0.1		8		12		37		<1	4	6	0.87	<5
13.2	168	Kuiu 1-9	SS					<5		<0.1		16		18		111		<1	11	23	2.32	<5
13.2	169	Kuiu 1-9	SS					<5		<0.1		15		14		111		<1	11	22	2.16	<5
13.2	170	Kuiu 1-9	R				Panned fg sed found in old box	2255		0.2		12		6		77		3	12	13	1.69	<5
13.2	171	Kuiu 1-9	SS					<5		<0.1		14		11		100		<1	9	21	1.54	<5
13.2	9624	Kuiu 1-9	SS					18		<0.1		17		25		93		<1	8	31	1.90	<5
13.3	172	Kuiu 1-9	SS					<5		<0.1		16		10		96		<1	11	13	1.60	<5
13.3	173	Kuiu 1-9	SS					12		0.2		16		23		130		<1	15	18	2.07	<5
14.1	3837	Port Malmesbury	R	G		OC	Ls w/ dissem py in gw	6		0.2		28		13		75		4	19	8	1.72	46
14.2	3838	Port Malmesbury	R	Rep	50	OC	Qz veinlets w/ sl & py	17		1.4		573		4		7.80	*	7	37	41	0.43	11
14.2	8754	Port Malmesbury	R	Rep	15	OC	Fel sill w/ pinkish weathering & 3% dissem py	<5		<0.1		56		3		10		<1	3	3	0.59	<5
14.2	8755	Port Malmesbury	R	Rep	0.2	RC	Fest qz vn w/ black sl & lesser cp	40		2.2		691		10		77		3	12	52	0.17	<5
14.2	8756	Port Malmesbury	R	Rep	0.8	RC	Qz vn w/ sl & py	542		1.2		710		6		10.17	*	2	9	31	0.26	<5
14.3	3839	Port Malmesbury	R	Rep	0.67	OC	Qz vn w/ py & gray sulf	1695		0.4		83		<2		116		8	27	125	0.22	>10000
14.3	3840	Port Malmesbury	R	Rep		OC	Fg sil dike w/ dissem sulf	15		0.3		533		4		59		5	22	17	1.49	556
14.4	3841	Port Malmesbury	R	Rep		OC	Qz veinlet w/ cp, gn, py	343		29.4		615		3308		6547		10	43	27	0.36	396
14.4	3842	Port Malmesbury	R	Rep		OC	Qz vn w/ cp, py, sl	9		0.7		1545		3		151		10	59	73	0.40	14
14.4	8757	Port Malmesbury	R	C	1.3	OC	Black to fest lens of msv py, qz, & lesser cp	15		1.0		3951		6		53		16	54	151	0.26	<5
14.5	3843	Port Malmesbury	R	Rep		OC	Qz vn w/ po, py, cp	<5		0.4		1289		3		16		6	29	39	1.28	6
14.5	3844	Port Malmesbury	R	G		FL	Skarn w/ sulf	<5		<0.1		99		6		20		9	13	5	1.33	<5
14.6	3845	Port Malmesbury	SS					15		<0.1		25		14		67		5	9	25	2.41	64
14.6	3846	Port Malmesbury	R	G		FL	Int w/ dissem & seams of py	19		<0.1		216		4		15		6	10	28	1.89	7
14.7	3848	Port Malmesbury	R	G		FL	Hornfels w/ dissem & seamed sulf	15		<0.1		65		5		25		3	14	18	1.86	56
14.8	3847	Port Malmesbury	R	G		FL	Qz vn w/ py, cp, po, aspy	0.526	*	1.3		241		7		7		<1	8	9	0.03	>10000
15.1	3849	Table Bay	R	Rep		OC	Knots of sulf along qz veinlets in gw	27		0.6		1310		7		22		10	36	77	2.17	50

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
10.11	3883	Skate Creek	1136	*	<5	0.44	<0.2	69	3.08	<2	0.043	0.28	64	0.20	4777	<0.01	<1	<5	<5	4	*	9	<10	<0.01	3	<20			
10.12	8773	Skate Creek	19		<5	0.35	2.4	58	8.02	6	0.164	0.17	16	0.20	11502	<0.01	<1	<5	<5	27	*	77	<10	<0.01	3	<20			
10.13	8774	Skate Creek	36		<5	0.69	5.0	76	5.40	4	0.223	0.24	34	0.28	7324	<0.01	<1	<5	<5	8	*	12	<10	<0.01	5	<20			
10.14	8770	Skate Creek	22		<5	0.38	20.8	102	2.33	<2	0.709	0.04	<1	0.13	1933	<0.01	<1	6	<5	59	*	113	<10	<0.01	3	<20			
10.15	8771	Skate Creek	29		<5	0.30	1.0	78	5.19	4	0.070	0.29	29	0.15	7178	<0.01	<1	<5	<5	7	*	62	<10	<0.01	3	<20			
10.16	8772	Skate Creek	58		<5	0.37	1.5	71	2.96	3	0.048	0.26	37	0.14	3937	<0.01	<1	<5	<5	9	*	37	<10	<0.01	4	<20			
10.17	8778	Skate Creek	89		<5	0.30	19.3	78	3.99	4	0.874	0.28	50	0.14	6349	0.01	<1	<5	<5	15	*	29	<10	<0.01	3	<20			
10.18	8780	Skate Creek	6		<5	0.02	1.9	33	>10	9	0.285	0.31	21	0.03	95	<0.01	<1	58	<5	133	*	18	<10	<0.01	3	<20			
10.19	8777	Skate Creek	8		<5	0.33	54.2	78	7.12	3	1.531	0.19	7	0.12	1845	<0.01	<1	18	<5	28	*	40	<10	<0.01	2	<31			
10.20	8779	Skate Creek	15		<5	0.19	91.0	14	>10	7	3.583	0.04	<1	0.12	3890	<0.01	<1	65	<5	94	*	18	<10	<0.01	3	<56			
10.21	3888	Skate Creek	14935	*	<5	0.96	1.3	82	3.10	<2	0.115	0.23	26	0.36	4266	<0.01	<1	<5	<5	21	*	80	<10	<0.01	5	<20			
10.22	3890	Skate Creek	**4.47%**	*	<5	0.90	14.5	227	3.34	2	0.571	0.08	2	0.30	510	<0.01	<1	26	<5	67	*	71	<10	<0.01	7	<20			
10.23	3889	Skate Creek	**3.78%**	*	<5	0.81	25.4	70	3.52	<2	1.077	0.23	16	0.31	2550	<0.01	<1	13	<5	21	*	62	<10	<0.01	4	<20			
10.24	3893	Skate Creek	12331	*	<5	8.88	348.5	36	2.55	4	7.155	0.06	5	0.68	3847	<0.01	<1	15	<5	30	*	103	11	<0.01	4	69			
10.25	3891	Skate Creek	4051	*	<5	2.99	14.1	68	3.12	<2	0.559	0.19	22	0.66	5363	<0.01	<1	<5	<5	11	*	46	<10	<0.01	4	<20			
10.26	3892	Skate Creek	1847	*	<5	0.60	0.5	101	2.46	<2	0.058	0.38	47	0.27	4538	0.01	<1	<5	<5	15	*	10	<10	<0.01	4	<20			
10.27	8781	Skate Creek	80		<5	1.04	2.7	67	8.05	8	0.162	0.24	33	0.40	14872	0.01	<1	<5	<5	15	*	51	<10	<0.01	2	<20			
11.1	148	Saginaw Bay Barite	**42.17%**	*	<5	6.23	<0.2	3	1.27	<2	0.633	0.01	<1	0.65	963	0.02	1	<5	<5	<20		1220	<10	<0.01	6	<20			
11.1	9607	Saginaw Bay Barite	**36.84%**	*	<5	12.40	<0.2	4	0.37	<2	2.011	<0.01	<1	0.16	430	0.01	2	7	<5	<20		864	<10	<0.01	3	<20			
12.1	174	Kadake Bay	1240	*	<5	1.80	1.8	48	3.83	8	0.150	0.17	2	0.98	700	0.09	<1	<5	14	<20		228	<10	<0.01	96	<20			
12.1	175	Kadake Bay	104	*	<5	16.84	0.8	4	2.55	<2	0.033	0.02	<1	4.36	1382	0.08	2	<5	<5	<20		1787	<10	<0.01	37	<20			
12.1	176	Kadake Bay	1050	*	<5	9.66	0.5	8	3.06	<2	0.049	0.03	<1	3.33	1466	0.07	2	<5	<5	<20		883	<10	<0.01	146	<20			
12.1	9627	Kadake Bay	2641	*	<5	15.85	0.6	11	3.26	<2	0.040	0.04	8	4.76	1377	0.08	2	<5	<5	<20		1910	<10	<0.01	121	<20			
13.1	9625	Kuiu 1-9	59		<5	0.30	<0.2	14	3.50	4	0.052	0.08	19	0.37	146	0.05	<1	<5	5	<20		24	<10	0.03	64	<20			
13.1	9626	Kuiu 1-9	159		<5	0.25	<0.2	9	3.76	4	0.119	0.04	5	0.18	531	0.02	<1	<5	<5	<20		34	<10	0.07	109	<20			
13.2	168	Kuiu 1-9	280		<5	0.47	0.2	18	5.64	4	0.195	0.05	10	0.61	1946	0.02	<1	<5	6	<20		49	<10	0.11	93	<20			
13.2	169	Kuiu 1-9	281		<5	0.51	<0.2	17	5.08	4	0.217	0.05	10	0.55	1893	0.02	<1	<5	5	<20		54	<10	0.09	85	<20			
13.2	170	Kuiu 1-9	885	*	<5	0.26	<0.2	285	3.40	4	0.154	0.10	10	0.38	758	0.07	5	<5	<5	<20		27	<10	0.09	63	<20			
13.2	171	Kuiu 1-9	444		<5	0.74	0.3	14	4.93	5	0.112	0.07	12	0.36	3053	0.03	<1	<5	<5	<20		97	<10	0.03	71	<20			
13.2	9624	Kuiu 1-9	238		<5	0.31	0.2	15	6.51	7	0.187	0.04	9	0.32	4138	0.02	<1	<5	<5	<20		31	<10	0.06	120	<20			
13.3	172	Kuiu 1-9	281		<5	0.63	0.3	17	4.45	5	0.640	0.10	19	0.63	891	0.02	<1	<5	7	<20		55	<10	0.05	79	<20			
13.3	173	Kuiu 1-9	448		<5	1.02	0.8	17	5.00	4	0.109	0.05	16	1.08	1696	0.03	<1	<5	7	<20		118	<10	0.06	76	<20			
14.1	3837	Port Malmesbury	275	*	<5	8.12	0.4	135	4.01	5	<0.01	0.33	7	2.09	473	0.05	3	<5	6	4	*	385	<10	<0.01	49	<20			
14.2	3838	Port Malmesbury	69	*	59	1.18	850.6	154	>10	7	0.213	0.08	1	0.27	213	0.07	<1	<5	<5	7	*	96	64	0.01	18	54			
14.2	8754	Port Malmesbury	35		<5	0.58	<0.2	86	1.55	<2	<0.01	0.12	6	0.29	112	0.08	1	<5	<5	<1	*	23	<10	0.04	12	<20			
14.2	8755	Port Malmesbury	7		541	0.33	1.6	75	>10	4	0.012	0.07	<1	0.14	54	0.04	<1	<5	<5	3	*	29	398	<0.01	9	<20			
14.2	8756	Port Malmesbury	8		9	0.24	1031.0	66	>10	6	0.388	0.05	<1	0.16	160	0.04	<1	<5	<5	2	*	40	14	<0.01	13	<248			
14.3	3839	Port Malmesbury	405	*	7	2.21	43.9	463	4.85	2	<0.01	0.10	2	0.14	151	0.03	<1	27	<5	8	*	21	32	<0.01	9	101			
14.3	3840	Port Malmesbury	921	*	<5	2.41	1.4	149	8.15	<2	<0.01	0.22	6	0.54	168	0.23	1	<5	<5	5	*	89	<10	0.15	43	<20			
14.4	3841	Port Malmesbury	219	*	<5	4.59	104.3	529	2.62	<2	0.059	0.08	4	0.55	535	0.05	<1	13	<5	10	*	151	<10	0.04	18	<20			
14.4	3842	Port Malmesbury	177	*	6	0.61	1.5	288	>10	6	<0.01	0.07	2	0.19	113	0.03	<1	<5	<5	10	*	29	13	0.03	19	<20			
14.4	8757	Port Malmesbury	7		35	0.53	2.2	36	>10	6	0.015	0.04	1	0.14	59	0.02	<1	<5	<5	16	*	25	36	0.02	9	319			
14.5	3843	Port Malmesbury	710	*	<5	1.28	0.2	192	>10	3	<0.01	0.09	6	0.28	133	0.18	<1	<5	<5	6	*	103	<10	0.12	26	76			
14.5	3844	Port Malmesbury	69	*	<5	>10	0.4	220	>10	18	<0.01	0.02	6	0.10	2267	0.04	4	<5	<5	8	*	146	<10	0.03	83	22	*		
14.6	3845	Port Malmesbury	453	*	<5	0.53	0.6	17	3.94	4	0.135	0.18	10	0.71	1785	0.06	7	<5	<5	5	*	31	<10	0.15	75	<20			
14.6	3846	Port Malmesbury	533	*	<5	1.68	<0.2	172	3.40	<2	<0.01	0.06	11	0.17	184	0.27	1	<5	<5	6	*	107	<10	0.15	28	<20			
14.7	3848	Port Malmesbury	287	*	<5	1.89	0.3	49	3.32	<2	<0.01	0.22	9	0.61	107	0.41	2	<5	<5	3	*	122	<10	0.18	41	<20			
14.8	3847	Port Malmesbury	<10	*	392	0.04	69.8	105	>10	4	0.071	<0.01	<1	0.02	22	<0.01	<1	56	<5	<1	*	10	20	<0.01	3	<20			
15.1	3849	Table Bay	200	*	<5	1.71	0.2	60	>10	8	0.014	0.27	7	0.58	196	0.28	<1	<5	<5	10	*	175	10	0.11	38	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
15.1	8758	Table Bay	R	C	0.6	OC	Skarn w/ knot of po & cp	8		0.9		3082		5		37		12	15	59	0.32	8
15.2	3850	Table Bay	R	Rep	2	OC	Qz vn w/ cp, po, cutting skarn	<5		0.2		460		<2		6		25	17	16	0.41	<5
15.2	3851	Table Bay	R	Rep		OC	Pod of sulf-rich skarn	<5		<0.1		454		3		14		112	38	16	1.93	13
16.1	3870	Kell Bay	R	C	1.3	OC	Qz vn w/ irregular pods of py	134		10.3		887		140		2959		6	23	27	0.32	1264
16.2	3869	Kell Bay	R	C	1.4	OC	Qz vn w/ dissem & msv py	8		4.0		434		215		811		6	16	11	0.39	256
16.3	3867	Kell Bay	R	C	0.7	OC	Qz vn/lens w/ py, trace gn in carb	85		15.0		878		335		457		6	5	53	0.18	937
16.4	3868	Kell Bay	R	C	1.2	OC	Gray ls w/ thin seams of py	<5		0.5		32		53		342		5	21	11	2.26	14
16.5	3871	Kell Bay	R	S		RC	Qz vn w/ py, gn, sl	35		25.2		1153		8692		14558		7	13	13	0.15	291
17.1	8767	Point Saint Albans	R	C	0.2	OC	Qz vn w/ py, minor gn & sl	5839		50.0		355		3415		3774		2	5	15	0.11	>10000
17.2	9628	Point Saint Albans	R	C	0.5	OC	Gw w/ py band at margins of dike	5535		33.6		313		152		8409		3	3	9	0.62	**1.55%**
17.3	178	Point Saint Albans	R	G	0.3	OC	Qz lens w/ py	<5		8.2		64		123		214		4	13	7	0.30	70
17.3	179	Point Saint Albans	R	C	0.1	OC	Qz lens w/ blebs of sl	<5		6.8		25		62		1.73	*	4	12	2	0.15	357
17.3	180	Point Saint Albans	R	C	0.4	OC	Qz vn w/ aspy, py, sl, gn	22		161.7		80		9834		2.40	*	2	7	6	0.82	**1.46%**
17.3	3859	Point Saint Albans	R	G		FL	Qz-cc cement br w/ sulf	11		151.0		94		2.41	*	9.90	*	3	2	2	0.15	1964
17.3	3862	Point Saint Albans	R	C	0.5	OC	Msv po & py w/ qz	<5		4.4		3094		13		58		3	6	43	0.07	8
17.3	3863	Point Saint Albans	R	SC	9@.5	OC	Sheared, fest mudstone w/ minor gn, sl	<5		36.7		43		1179		2971		5	10	6	0.49	239
17.3	3864	Point Saint Albans	R	Rep	5	OC	Mafic dike w/ minor sulf	<5		0.2		21		15		170		4	4	27	1.00	<5
17.3	9629	Point Saint Albans	R	C	2.4	OC	Fault zone in gw w/ qz & sulf	42		16.1		24		764		7343		4	9	4	0.23	7432
17.3	9630	Point Saint Albans	R	C	1.1	OC	Fest shear zone w/ qz & sulf	7		34.7		45		2106		2279		2	10	7	0.47	**5.53%**
17.3	9631	Point Saint Albans	R	S	0.4	OC	Sheared gw br w/ gn	20		342.2		30		8.15	*	1.12	*	3	4	3	0.44	**1.37%**
17.4	3860	Point Saint Albans	R	G		RC	Diorite w/ dissem sulf	<5		0.7		60		86		227		4	16	19	2.57	18
17.5	177	Point Saint Albans	R	Rep	1.5	OC	Fest qz-cc zone w/ py, fg sl	91		5.7		16		381		2186		2	6	5	0.41	**2.17%**
17.5	3861	Point Saint Albans	R	SC	11@1.5	OC	Fest br w/ minor sulf	<5		7.7		47		47		376		3	16	18	1.35	65
17.5	8766	Point Saint Albans	R	Rep	7	OC	Sheared mudstone w/ py & aspy?	<5		0.7		68		329		811		2	10	9	1.08	2266
18.1	3853	Coronation Island	R	Rep		TP	Ls br w/ limonite	<5		3.2		45		838		7355		9	16	3	0.05	36
18.1	3854	Coronation Island	R	G		UW	Fest flt gouge	<5		<0.1		39		45		724		2	24	15	2.97	5
18.1	3855	Coronation Island	R	G		UW	Ls br & cc vn, fest	<5		3.5		10		929		3730		9	1	<1	0.02	<5
18.1	3856	Coronation Island	R	G		UW	Cc vn w/ gn	27		75.0		65		1.95	*	4.30	*	7	1	<1	0.02	20
18.1	8760	Coronation Island	R	G	0.6	RC	Limonite w/ knots of gn	0.407	*	681.9		921		12.32	*	3.58	*	<1	<1	1	0.33	>10000
18.2	3852	Coronation Island	R	G		UW	Br zone w/ cc & limonite	322		11.5		33		1045		3333		7	2	<1	0.08	293
18.2	8759	Coronation Island	R	G		UW	Br zone w/ cc in limonite matrix	674		4.2		43		648		1996		3	<1	<1	0.02	487
19.1	3857	Alikula Bay	R	SC	12@1	OC	Sulf pod in ls	1409		10.8		1116		3373		1677		9	2	1	<0.01	>10000
19.2	8764	Alikula Bay	R	SC	6@.5	OC	Msv sulf in ls	502		15.8		983		3250		8748		2	1	<1	<0.01	5393
19.3	8762	Alikula Bay	R	SC	20@1	OC	10 ftx28 ft pod of msv sulf in ls, mainly py	3347		15.9		1102		2556		6630		<1	<1	<1	<0.01	3290
19.4	8765	Alikula Bay	R	S		OC	Msv sulf w/ sl, py	1256		29.2		839		>10000		8.69	*	<1	<1	<1	<0.01	2668
19.5	8763	Alikula Bay	R	SC	8@1	OC	10 ft x 28 ft pod of msv sulf in ls, mainly py	8483		22.5		1173		7515		4.89	*	<1	1	<1	<0.01	2581
19.6	8761	Alikula Bay	R	C	6.5	OC	10 ft x 25 ft pod of msv sulf in ls, mainly py	3654		19.0		1055		5964		14164		2	<1	<1	<0.01	3775
19.7	3858	Alikula Bay	R	S		RC	Msv sl, stibnite, py, po	1781		25.6		830		9890		14.90	*	2	<1	<1	0.01	1247
20.1	2363	Pinta Point	R	Rep	11	OC	Gp sc & chert w/ msv & dissem sulf	43		0.8		143		20		624		52	278	21	1.75	226
20.1	2364	Pinta Point	R	S		OC	Gp sc/slate w/ seams of py	78		2.1		249		44		878		52	427	13	0.53	287
20.1	2391	Pinta Point	R	S		OC	Fel sc w/ layered sulf	81		0.9		165		38		489		51	261	24	1.19	279
20.1	3928	Pinta Point	R	G		RC	Fest slate w/ dissem py	<5		0.3		290		6		476		26	168	23	2.10	10
20.1	8804	Pinta Point	R	S		OC	Msv py	435		3.0		251		54		1038		90	327	19	0.94	251
21.1	3710	Kake Area Road System	R	S		TP	Py in narrow alt shear zone in hbl diorite	13		1.0		56		5		18		27	23	128	0.23	<5
21.1	3711	Kake Area Road System	R	S		TP	Msv cp, py in hbl diorite	454		30.6		11.20	*	8		275		1253	37	35	1.10	<5
21.2	3705	Kake Area Road System	R	S		OC	Msv barite w/ gn, sl	49		13.1		66		1.02	*	3.00	*	<1	3	1	0.08	16
21.2	8671	Kake Area Road System	R	S		OC	Barite w/ qz, sl, trace gn	27		3.3		69		2070		2.90	*	<1	3	1	0.11	10
21.3	3700	Kake Area Road System	R	Rep		TP	Band of py, sl, cp in sil ar	1135		30.5		7327		501		5.40	*	<1	16	44	0.76	412
22.1	3730	Gunnuk Creek	SS					6		<0.1		48		14		167		2	48	16	1.99	9

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
15.1	8758	Table Bay	4		<5	0.81	1	28	>10	6	0.019	<0.01	3	0.17	126	<0.01	<1	<5	<5	<4	*	13	<10	0.02	26	####	*		
15.2	3850	Table Bay	<10	*	<5	1.53	<0.2	160	4.06	2	<0.01	0.04	2	0.04	398	0.05	<1	<5	<5	<4	*	12	<10	0.03	19	185	*		
15.2	3851	Table Bay	<10	*	<5	6.62	<0.2	66	>10	10	<0.01	0.02	7	0.11	2779	0.06	2	<5	<5	8	*	33	<10	0.08	55	7	*		
16.1	3870	Kell Bay	30	*	<5	7.74	24.0	70	5.53	2	0.077	0.10	6	1.86	1432	<0.01	<1	14	<5	6	*	125	<10	<0.01	13	<20			
16.2	3869	Kell Bay	24	*	<5	7.74	6.6	75	>10	3	0.019	0.10	6	0.18	1331	<0.01	<1	6	<5	6	*	115	<10	<0.01	12	<20			
16.3	3867	Kell Bay	<10	*	18	>10	6.7	50	6.34	<2	0.016	0.04	5	0.31	3540	<0.01	<1	7	<5	6	*	456	<10	<0.01	8	<20			
16.4	3868	Kell Bay	291	*	<5	7.58	2.1	38	6.91	6	0.015	0.31	7	1.23	1280	0.04	2	6	8	5	*	194	<10	<0.01	58	<20			
16.5	3871	Kell Bay	<10	*	6	0.30	120.4	189	6.24	3	0.393	0.05	<1	0.07	94	<0.01	<1	12	<5	7	*	9	<10	<0.01	10	<20			
17.1	8767	Point Saint Albans	9		15	2.43	<288.6	74	>10	5	0.394	0.07	2	0.62	3495	0.03	<1	674	<5	2	*	102	<10	<0.01	5	<20			
17.2	9628	Point Saint Albans	2444		17	1.33	95.1	65	7.09	3	0.810	0.33	3	0.29	1815	0.03	<1	69	<5	<20		35	<10	<0.01	4	<20			
17.3	178	Point Saint Albans	140	*	<5	3.12	1.4	91	3.65	<2	0.089	0.16	<1	0.83	477	0.04	<1	61	<5	<20		82	<10	<0.01	14	<20			
17.3	179	Point Saint Albans	61	*	<5	2.62	123.1	137	2.11	<2	1.655	0.07	1	0.59	561	0.02	<1	30	<5	<20		51	10	<0.01	17	<20			
17.3	180	Point Saint Albans	<10	*	<5	7.44	171.1	66	4.09	2	2.710	0.08	<1	0.70	1407	0.02	1	**0.44%**	<5	<20		226	14	<0.01	29	20			
17.3	3859	Point Saint Albans	<10	*	<5	>10	699.6	72	8.29	4	8.821	0.07	4	2.52	2768	0.02	<1	>2000	<5	3	*	185	20	<0.01	14	83			
17.3	3862	Point Saint Albans	<10	*	<5	0.19	1.0	32	>10	10	0.014	0.04	4	0.05	55	0.04	<1	<5	<5	3	*	31	15	<0.01	7	128			
17.3	3863	Point Saint Albans	32	*	<5	>10	22.3	60	7.43	3	0.229	0.26	10	2.22	2317	0.04	<1	49	6	5	*	192	<10	<0.01	34	<20			
17.3	3864	Point Saint Albans	583	*	<5	1.65	0.6	30	8.94	<2	<0.01	0.12	24	1.18	1041	0.35	14	7	5	4	*	46	<10	0.45	176	<20			
17.3	9629	Point Saint Albans	350	*	<5	4.66	32.6	64	4.64	<2	1.010	0.13	3	1.14	1780	0.03	<1	398	<5	<20		159	<10	<0.01	5	<20			
17.3	9630	Point Saint Albans	117	*	<5	4.54	<0.2	64	7.86	2	0.252	0.15	3	1.30	1169	0.03	<1	275	7	<20		130	<10	<0.01	24	<20			
17.3	9631	Point Saint Albans	106	*	<5	4.82	123.4	60	4.67	<2	2.249	0.18	2	1.18	1275	0.03	<1	530	<5	<20		144	<10	<0.01	9	<20			
17.4	3860	Point Saint Albans	432	*	<5	2.22	2.5	75	3.13	<2	0.021	0.20	11	0.65	267	0.35	7	20	<5	4	*	147	<10	0.26	94	<20			
17.5	177	Point Saint Albans	**2.17%**	*	<5	5.04	0.4	65	4.83	<2	0.308	0.13	<1	1.06	1430	0.02	<1	254	<5	<20		176	<10	<0.01	9	<20			
17.5	3861	Point Saint Albans	150	*	<5	9.05	3.8	71	7.38	5	0.034	0.36	11	2.46	1529	0.03	4	25	10	3	*	222	<10	<0.01	66	<20			
17.5	8766	Point Saint Albans	51		<5	7.88	2.5	23	4.84	4	0.099	0.37	7	1.69	788	0.08	2	131	7	2	*	198	<10	<0.01	32	<20			
18.1	3853	Coronation Island	<10	*	<5	>10	41.1	3	2.28	<2	13.160	<0.01	3	0.75	558	<0.01	<1	7	<5	9	*	162	<10	<0.01	4	<20			
18.1	3854	Coronation Island	109	*	<5	7.14	1.7	31	6.09	7	0.170	0.13	9	2.14	478	0.01	5	22	11	2	*	25	<10	0.06	90	<20			
18.1	3855	Coronation Island	<10	*	<5	>10	55.3	5	0.10	<2	0.288	<0.01	2	0.48	1894	<0.01	<1	8	<5	9	*	534	<10	<0.01	2	<20			
18.1	3856	Coronation Island	<10	*	<5	>10	704.0	3	0.65	<2	4.074	<0.01	3	0.16	3401	<0.01	<1	82	<5	7	*	247	12	<0.01	1	38			
18.1	8760	Coronation Island	11		<5	0.25	<108.5	4	>10	22	39.340	0.03	3	0.11	124	<0.01	<1	407	<5	<1	*	20	<10	<0.01	15	<67			
18.2	3852	Coronation Island	<10	*	<5	>10	74.4	7	1.38	<2	0.533	0.03	4	6.33	3487	<0.01	<1	8	<5	7	*	74	<10	<0.01	7	<20			
18.2	8759	Coronation Island	9		<5	>10	18.8	3	1.12	<2	0.161	<0.01	4	3.55	3412	<0.01	<1	<5	<5	3	*	77	<10	<0.01	3	<20			
19.1	3857	Alikula Bay	<10	*	40	0.94	60.1	29	>10	11	0.273	0.17	<1	0.50	618	0.07	<1	241	<5	28	*	44	15	<0.01	8	<4	*		
19.2	8764	Alikula Bay	5		83	2.61	80.5	26	>10	9	0.600	0.05	<1	1.78	3714	0.03	<1	447	<5	15	*	30	<10	<0.01	5	<4	*		
19.3	8762	Alikula Bay	5		59	0.80	61.5	17	>10	8	0.351	0.01	<1	0.29	918	0.01	<1	586	<5	19	*	17	<10	<0.01	3	<4	*		
19.4	8765	Alikula Bay	3		121	0.07	704.4	18	>10	6	2.011	<0.01	<1	0.03	596	<0.01	<1	1580	<5	41	*	10	<10	<0.01	2	<4	*		
19.5	8763	Alikula Bay	6		95	0.06	384.6	32	>10	8	1.505	0.01	<1	0.04	542	0.01	<1	971	<5	25	*	27	<10	<0.01	3	<4	*		
19.6	8761	Alikula Bay	5		71	2.01	111.3	10	>10	9	0.497	0.04	<1	1.32	3231	0.03	<1	426	<5	17	*	29	<10	<0.01	5	<4	*		
19.7	3858	Alikula Bay	<10	*	236	0.37	1665.5	39	>10	12	3.462	<0.01	<1	0.18	889	<0.01	<1	>2000	<5	45	*	23	32	<0.01	4	<4	*		
20.1	2363	Pinta Point	952	*	<5	5.27	3.9	132	20.07	<2	0.330	0.14	3	1.69	1019	0.01	5	12	9	<20		91	<10	0.01	150	<20			
20.1	2364	Pinta Point	746	*	<5	4.93	5.4	77	17.41	<2	1.359	0.13	2	0.42	301	<0.01	1	27	<5	<20		151	<10	<0.01	78	<20			
20.1	2391	Pinta Point	1201	*	<5	1.66	2.0	83	24.87	<2	1.868	0.17	3	1.05	466	0.01	<1	7	<5	<20		11	<10	<0.01	90	<20			
20.1	3928	Pinta Point	819	*	<5	2.47	4.8	126	8.93	8	0.037	0.09	3	2.06	611	0.01	9	<5	5	<20		57	<10	<0.01	127	<20			
20.1	8804	Pinta Point	474	*	<5	1.53	4.3	58	>10	9	0.207	0.06	6	0.75	323	<0.01	5	8	<5	<20		27	12	0.08	76	<20			
21.1	3710	Kake Area Road System	45	*	<5	0.04	0.4	56	40.54	<2		0.01	<1	0.03	26	<0.01	<1	<5	<5	<20		12	<10	<0.01	7	<20			
21.1	3711	Kake Area Road System	565	*	20	0.27	4.1	107	17.41	<2		0.06	<1	0.61	246	0.01	<1	<5	<5	<20		28	12	0.19	98	<20			
21.2	3705	Kake Area Road System	**48.37%**	*	<5	0.42	197.5	9	0.68	6		0.03	<1	0.18	200	<0.01	<1	11	<5	<20		109	12	<0.01	2	27			
21.2	8671	Kake Area Road System	**46.12%**	*	<5	0.65	188.6	15	0.54	5	1.329	0.03	<1	0.28	389	<0.01	<1	<5	<5	<20		192	12	<0.01	2	26			
21.3	3700	Kake Area Road System	1051	*	33	0.11	196.1	52	25.41	4		0.05	<1	0.35	496	0.01	<1	6	<5	<20		8	43	<0.01	16	47			
22.1	3730	Gunnuk Creek	993	*	<5	0.83	0.5	45	4.11	3		0.20	9	1.16	1713	0.02	<1	<5	<5	<20		42	<10	0.09	59	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
22.1	8689	Gunnuk Creek	SS					<5		0.2		28		13		140		2	34	14	1.72	11
22.2	3729	Gunnuk Creek	SS					<5		<0.1		24		12		122		<1	24	13	1.57	8
22.2	8688	Gunnuk Creek	SS					<5		0.2		30		11		161		4	91	18	1.80	16
22.3	3728	Gunnuk Creek	SS					<5		<0.1		25		12		119		<1	23	12	1.53	9
23.1	3894	RD8	R	S		TP	Msv py seams in sil sc	105		0.9		313		60		364		6	76	79	0.73	727
23.1	3895	RD8	R	C	1.7	TP	Carbonaceous sc w/ minor py	12		0.4		63		11		111		5	29	4	0.79	33
23.1	8782	RD8	R	S		RC	Qz from vn w/ py	29		0.5		109		36		114		3	27	25	1.17	46
23.1	8783	RD8	R	S		RC	Py-bearing qz	10		0.2		45		19		50		3	31	27	0.24	45
23.2	3896	RD8	R	S		TP	Py in chert & sil sc	9		0.7		110		271		136		5	64	38	0.44	59
23.2	3897	RD8	R	S		TP	Msv sulf in sil sc	12		0.9		166		184		177		7	67	55	0.44	73
23.2	8775	RD8	R	G		RC	Metased w/ py	7		0.2		41		262		453		2	18	11	1.09	28
23.2	8776	RD8	R	S		RC	Fest metased w/ dissem & vns of py	<5		0.4		63		140		514		2	52	43	0.49	33
23.2	8784	RD8	R	SC	8@1	OC	Sil metased w/ dissem py	29		0.4		34		229		40		5	24	24	0.83	55
23.2	8785	RD8	R	C	2	OC	Py-bearing vn or band in basalt	19		0.8		87		920		1075		6	19	19	0.62	77
23.2	8786	RD8	R	C	2	OC	Py-bearing vn in basalt	<5		<0.1		12		37		33		<1	13	4	0.20	7
23.3	3886	RD8	R	Rep	2	TP	Sil br in gw	<5		2.9		1433		14		131		6	7	3	0.67	<5
23.3	3887	RD8	R	G		TP	Qz w/ minor sulf	14		0.6		27		36		103		9	12	19	0.43	17
23.4	3885	RD8	R	S		TP	Qz w/ minor sulf in gw	<5		<0.1		37		6		31		4	9	12	1.72	9
23.5	3898	RD8	R	S		RC	Qz w/ sulf	7		0.1		63		22		220		3	13	11	0.31	10
23.6	1594	RD8	SS					8		<0.2		28		7		158		3	34	16	2.00	10
23.6	1595	RD8	SS					<5		<0.2		41		8		127		2	34	16	1.82	10
23.6	1596	RD8	SS					7		<0.2		47		10		303		6	71	20	1.75	20
23.7	1592	RD8	SS					12		<0.2		94		19		1361		12	249	42	2.51	33
23.7	1593	RD8	SS					<5		<0.2		30		8		106		1	22	18	2.42	7
23.7	6425	RD8	R	G		FL	Light green mariposite(?) sc w/ minor py	136		<0.1		42		15		285		3	320	44	1.40	382
23.8	1584	RD8	SS					32		0.3		90		30		686		26	190	39	1.60	86
23.9	1583	RD8	SS					21		<0.2		99		21		859		33	203	37	1.38	82
23.9	1585	RD8	SS					25		0.7		138		55		1707		33	411	43	1.24	99
23.9	6417	RD8	R	Rep		TP	Arg w/ dissem & veinlets of py	35		1.4		62		66		138		42	175	8	0.46	70
23.10	1580	RD8	SS					19		<0.2		70		27		505		46	118	44	1.55	125
23.10	1581	RD8	S					13		<0.2		10		8		95		<1	11	13	2.05	<5
23.10	1582	RD8	SS					14		<0.2		101		31		520		27	139	33	1.41	97
23.11	3905	RD8	R	G		TP	Sil ar w/ fg py	13		0.5		22		14		29		5	16	4	0.41	37
23.11	3906	RD8	R	G		TP	Barite vn w/ minor py	<5		<0.1		41		<2		9		<1	2	<1	0.09	<5
23.11	8791	RD8	R	Rep		OC	Slate to sc w/ 30% py	15		0.7		29		35		39		15	21	3	0.29	84
23.11	8792	RD8	R	Rep		RC	Sil slate/sc to chert w/ 5% py	9		0.1		22		6		29		<1	13	4	0.60	19
23.12	3900	RD8	R	C	1.3	OC	Sil sc w/ msv py	46		1.3		107		380		675		6	10	2	0.30	87
23.12	3901	RD8	R	S		OC	Msv py in sil sc	45		2.6		44		90		999		4	70	17	0.41	108
23.12	8787	RD8	R	C	4	OC	Py in vns & dissem, & in qz	43		1.7		81		80		1762		2	76	33	0.80	87
23.13	1586	RD8	S					18		0.5		45		10		149		7	30	20	4.54	31
23.14	1562	RD8	S					7		<0.2		13		9		37		2	10	4	2.12	6
23.14	1563	RD8	S					6		<0.2		38		11		56		1	20	7	3.30	9
23.14	6408	RD8	SS					5		<0.2		35		13		226		5	37	30	2.20	33
23.14	6409	RD8	R	Rep		OC	Phy w/ minor py/po	<5		0.3		58		5		97		2	15	16	2.58	6
23.15	6406	RD8	SS					<5		<0.2		28		7		236		3	71	24	2.46	16
23.15	6407	RD8	R	G		OC	Intermed volc w/ patches of py & po	6		<0.1		184		6		58		<1	61	42	2.72	<5
23.16	6405	RD8	SS					<5		<0.2		26		9		83		2	16	19	2.13	14
23.17	3904	RD8	R	S		TP	Slate w/ py	19		0.7		143		13		196		6	65	10	0.63	44
23.17	8790	RD8	R	S		RC	Altered sc/slate	15		0.5		51		18		113		6	73	9	0.45	87

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
22.1	8689	Gunnuk Creek	987	*	<5	0.41	0.3	35	3.77	3	0.097	0.12	8	0.77	2050	0.02	<1	<5	<5	<20		22	<10	0.04	52	<20			
22.2	3729	Gunnuk Creek	953	*	<5	0.35	0.2	28	3.31	3		0.11	8	0.69	1696	0.01	<1	<5	<5	<20		19	<10	0.05	48	<20			
22.2	8688	Gunnuk Creek	283		<5	0.42	0.8	57	3.99	3	0.099	0.12	9	0.99	2182	0.01	<1	<5	<5	<20		18	<10	0.03	56	<20			
22.3	3728	Gunnuk Creek	1010	*	<5	0.37	0.2	28	3.45	3		0.12	8	0.67	1753	0.02	<1	<5	<5	<20		25	<10	0.05	50	<20			
23.1	3894	RD8	3720	*	<5	2.09	1.8	59	>10	6	0.132	0.03	3	1.16	4279	<0.01	<1	<5	<5	6	*	117	<10	<0.01	33	<20			
23.1	3895	RD8	1222	*	<5	1.04	0.3	153	2.38	3	0.097	0.20	6	0.59	554	<0.01	2	<5	<5	5	*	51	<10	<0.01	36	<20			
23.1	8782	RD8	45		<5	0.27	0.3	136	4.60	5	0.048	<0.01	5	0.90	630	<0.01	3	<5	<5	3	*	26	<10	<0.01	43	<20			
23.1	8783	RD8	24		<5	1.89	0.3	120	7.73	4	0.102	0.02	3	0.88	3916	<0.01	5	<5	<5	3	*	47	<10	<0.01	61	<20			
23.2	3896	RD8	318	*	<5	2.91	0.6	96	9.84	3	0.460	0.35	4	1.02	956	<0.01	<1	9	<5	5	*	76	<10	<0.01	26	<20			
23.2	3897	RD8	729	*	<5	0.15	0.5	74	>10	5	0.674	0.35	2	0.08	431	<0.01	<1	10	<5	7	*	14	<10	<0.01	32	<20			
23.2	8775	RD8	43		<5	2.59	2.2	63	5.85	6	0.174	0.47	6	0.57	1096	0.01	<1	<5	<5	2	*	104	<10	<0.01	5	<20			
23.2	8776	RD8	15		<5	0.54	1.7	51	8.37	5	0.704	0.39	10	0.17	507	<0.01	<1	15	<5	2	*	17	<10	<0.01	11	<20			
23.2	8784	RD8	22		<5	0.08	<0.2	74	7.15	7	0.344	0.48	12	0.21	169	0.02	<1	<5	<5	5	*	5	<10	<0.01	7	<20			
23.2	8785	RD8	12		<5	0.07	2.1	57	9.46	6	6.824	0.42	10	0.16	154	0.02	<1	7	<5	6	*	7	<10	<0.01	8	<20			
23.2	8786	RD8	81		<5	0.58	0.2	165	1.50	<2	0.043	0.18	4	0.15	168	<0.01	<1	<5	<5	<1	*	20	<10	<0.01	4	<20			
23.3	3886	RD8	2071	*	<5	1.14	<0.2	135	2.97	4	0.738	0.34	14	0.15	393	0.03	<1	<5	<5	6	*	33	<10	<0.01	19	<20			
23.3	3887	RD8	734	*	<5	1.01	0.2	143	2.45	2	0.118	0.19	5	0.14	331	0.03	<1	<5	<5	9	*	37	<10	<0.01	9	<20			
23.4	3885	RD8	1035	*	<5	1.63	<0.2	90	2.89	<2	0.014	0.13	5	0.84	403	0.06	5	<5	<5	4	*	154	<10	0.15	70	<20			
23.5	3898	RD8	161	*	<5	0.75	1.3	93	2.14	<2	0.315	0.04	7	0.39	362	0.12	2	<5	<5	3	*	12	<10	<0.01	27	<20			
23.6	1594	RD8	1017	*	<5	0.72	0.9	28	3.60	<2	0.232	0.10	12	0.56	1815	0.02	6	<5	<5	<20		41	<10	0.11	67	<20			
23.6	1595	RD8	1029	*	<5	0.63	0.6	29	3.71	<2	0.142	0.13	11	0.77	1036	0.03	7	<5	<5	<20		37	<10	0.13	70	<20			
23.6	1596	RD8	1070	*	<5	0.67	2.7	31	4.54	<2	0.305	0.13	10	0.68	2078	0.03	7	7	<5	<20		40	<10	0.09	77	<20			
23.7	1592	RD8	1004	*	<5	0.84	19.2	33	5.82	<2	0.523	0.11	17	0.55	4934	0.02	8	9	5	<20		40	<10	0.08	97	<20			
23.7	1593	RD8	995	*	<5	0.86	0.7	28	3.83	<2	0.120	0.11	10	0.68	1784	0.02	6	<5	<5	<20		47	<10	0.13	66	<20			
23.7	6425	RD8	136	*	<5	9.25	1.4	520	5.85	<2	0.602	0.08	3	6.11	2717	0.02	6	56	18	<4	*	218	<10	<0.01	86	6	*		
23.8	1584	RD8	2096	*	<5	0.64	10.8	22	8.64	<2	1.339	0.12	12	0.25	9433	0.02	11	33	<5	<20		41	<10	0.02	129	<20			
23.9	1583	RD8	1105	*	<5	0.46	10.1	19	7.50	<2	1.184	0.11	13	0.27	5831	0.01	12	23	<5	<20		24	<10	0.03	136	<20			
23.9	1585	RD8	1491	*	<5	0.53	25.7	34	8.76	<2	1.324	0.11	15	0.29	5232	0.01	11	26	<5	<20		35	<10	<0.01	133	<20			
23.9	6417	RD8	739	*	<5	0.12	1.7	118	5.56	<2	0.350	0.22	6	0.12	25	<0.01	8	12	<5	<4	*	3	<10	<0.01	107	6	*		
23.10	1580	RD8	963	*	<5	0.41	7.9	31	>10	2	0.953	0.11	12	0.40	12147	0.04	20	28	<5	<20		28	<10	0.04	228	<20			
23.10	1581	RD8	538	*	<5	0.05	0.8	14	>10	35	0.203	0.01	5	0.11	321	0.01	5	<5	13	<20		4	<10	0.11	225	<20			
23.10	1582	RD8	689	*	<5	0.56	5.8	25	>10	<2	1.827	0.07	13	0.23	5734	0.02	8	56	<5	<20		33	<10	0.04	108	<20			
23.11	3905	RD8	829	*	<5	3.21	<0.2	100	5.08	2	0.081	0.11	4	1.57	2846	<0.01	<1	6	<5	5	*	129	<10	<0.01	16	<20			
23.11	3906	RD8	**41.00%**	*	<5	2.19	<0.2	43	1.22	<2	<0.01	0.03	3	0.81	2101	<0.01	<1	<5	<5	<1	*	729	<10	<0.01	3	<20			
23.11	8791	RD8	5		<5	2.08	0.6	106	>10	5	0.272	0.11	2	1.00	1657	<0.01	<1	5	<5	15	*	72	<10	<0.01	18	<20			
23.11	8792	RD8	43		<5	1.07	<0.2	91	3.65	3	0.042	0.09	5	1.08	913	<0.01	<1	<5	<5	<1	*	35	<10	<0.01	10	<20			
23.12	3900	RD8	9176	*	<5	0.03	3.1	168	4.27	3	0.595	0.10	<1	0.03	39	0.03	<1	<5	<5	6	*	14	<10	<0.01	16	<20			
23.12	3901	RD8	4527	*	<5	0.16	5.8	141	9.24	3	0.240	0.18	<1	0.09	152	0.04	1	7	<5	4	*	11	<10	<0.01	35	<20			
23.12	8787	RD8	17		<5	0.32	11.0	145	6.48	4	0.190	0.26	1	0.35	1123	0.05	5	<5	12	2	*	10	<10	<0.01	63	<20			
23.13	1586	RD8	1264	*	<5	0.18	0.7	39	6.72	23	0.407	0.07	7	0.27	1258	0.01	6	10	6	<20		6	<10	0.10	161	<20			
23.14	1562	RD8	672	*	<5	0.17	0.2	32	2.75	8	0.091	0.05	8	0.39	176	0.01	8	<5	5	<20		11	<10	0.24	87	<20			
23.14	1563	RD8	692	*	<5	0.22	0.3	38	3.99	3	0.124	0.06	8	0.55	296	0.02	9	<5	6	<20		11	<10	0.19	78	<20			
23.14	6408	RD8	1018	*	<5	0.68	1.7	30	6.77	<2	0.140	0.09	10	0.71	4821	0.02	6	<5	<5	<20		34	<10	0.08	78	<20			
23.14	6409	RD8	574	*	<5	0.88	0.4	76	4.96	<2	0.012	0.26	6	1.66	799	0.05	3	<5	9	<4	*	14	<10	0.09	74	11	*		
23.15	6406	RD8	891	*	<5	0.83	3.7	33	6.37	<2	0.092	0.08	8	0.85	4042	0.03	6	<5	<5	<20		32	<10	0.10	81	<20			
23.15	6407	RD8	655	*	<5	1.08	0.7	120	5.12	<2	<0.01	0.05	<1	2.27	764	0.15	9	<5	12	<4	*	17	<10	0.19	192	9	*		
23.16	6405	RD8	1004	*	<5	0.45	0.4	20	4.33	<2	0.068	0.11	9	0.79	2328	0.02	4	<5	<5	<20		23	<10	0.09	61	<20			
23.17	3904	RD8	123	*	<5	2.34	0.7	133	9.89	4	0.174	0.02	9	0.66	1855	<0.01	18	<5	<5	6	*	89	<10	<0.01	232	<20			
23.17	8790	RD8	10		<5	0.36	0.7	110	9.7	4	0.101	0.06	3	0.26	263	<0.01	7	<5	<5	6	*	13	<10	<0.01	83	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
23.18	3902	RD8	R	Rep		TP	Carbonate-rich dike w/ py	<5		<0.1		26		5		132		3	29	28	3.33	20
23.18	3903	RD8	R	G		TP	Slate w/ interbedded py	53		3.6		205		205		1740		70	486	19	1.28	257
23.18	8788	RD8	R	G		OC	Dark gray to black slate to sc	41		2.1		79		53		427		28	<1	<1	<0.01	<5
23.18	8789	RD8	R	S		RC	Sc/slate w/ conformable & dissem py	48		2		119		66		639		65	317	9	0.29	168
24.1	111	Towers Creek	R	C	0.9	OC	Fest sc w/ fg py, po, cp	16		0.2		565		6		98		6	69	42	2.14	24
24.1	112	Towers Creek	R	C	4.5	OC	Fest sc w/ fg py, po, cp	9		<0.1		175		7		77		6	54	46	2.98	18
24.1	113	Towers Creek	R	Rep	0.6	OC	Sulf band of msv fg py, w/ sparse cp	8		<0.1		192		6		54		4	48	57	2.07	21
24.1	270	Towers Creek	R	Rep	2.1	OC	Gs w/ dissem sulf	8		<0.1		250		13		90		7	50	30	2.72	18
24.1	271	Towers Creek	R	Rep	1.7	OC	Gs sc w/ dissem sulf	11		0.1		238		8		40		10	84	55	1.00	64
24.1	272	Towers Creek	R	Rep	1.1	OC	Gs sc w/ dissem sulf	5		0.2		713		9		71		13	82	27	1.85	34
24.2	2345	Towers Creek	R	C	0.5	RC	Mica sc w/ banded sulf	69		0.4		185		8		27		3	136	86	0.36	22
24.2	2346	Towers Creek	SS					12		0.5		114		31		171		4	29	15	1.34	40
24.2	2347	Towers Creek	R	G	0.5	FL	Sil gs br w/ py	7		<0.1		94		5		69		2	45	40	0.51	10
24.2	9558	Towers Creek	R	RC	1.5	RC	Fest gray sc w/ banded & nodular sulf	24		0.2		200		6		32		2	132	59	0.57	15
24.2	9559	Towers Creek	SS					<5		<0.1		37		7		76		<1	22	14	1.38	7
25.1	2832	Northern Copper	R	C	3	UW	Sulf band w/ py, po, cp	144		11.0		3.10	*	9		370		4	32	139	1.34	<5
25.1	2833	Northern Copper	R	C	2.5	UW	Gs w/ py, po, cp	152		15.7		4.60	*	12		801		5	35	145	0.88	<5
25.2	415	Northern Copper	R	C	2	UW	Msv cp, py, po	389		37.7		12.40	*	9		631		2	26	425	1.16	<5
25.2	416	Northern Copper	R	CC	0.75	UW	Msv sulf in gs	332		23.0		7.40	*	9		772		3	38	281	2.33	<5
25.2	417	Northern Copper	R	Rep	0.25	OC	Sulf band w/ py, po, cp	440		15.1		4.70	*	13		947		2	70	562	0.92	18
25.3	3723	Northern Copper	R	C	5.1	UW	Sil gs w/ po & minor cp	7		0.6		2973		33		5837		<1	11	18	0.14	<5
25.3	3724	Northern Copper	R	SC	5@.5	UW	Sil gs w/ po	<5		<0.1		376		7		2028		<1	2	4	0.13	<5
25.4	107	Northern Copper	R	Rep		MD	Calc gs w/ bands & blebs of po, cp, sl	21		8.5		1.20	*	14		661		<1	<1	11	0.13	<5
25.4	108	Northern Copper	R	Rep	3	MD	Gs w/ sl, cp, po, py	<5		1.4		1717		42		1.20	*	<1	7	9	0.48	<5
25.4	268	Northern Copper	R	S		MD	Gs w/ dissem & msv sulf	6		1.7		8222		12		83		<1	9	169	0.05	<5
25.5	8677	Northern Copper	R	Rep	1	TP	Chl sc w/ irregular seams & pods of po & cp	<5		3.3		1.03	*	6		224		<1	2	8	0.16	<5
25.6	8676	Northern Copper	R	Rep	2.5	TP	Sil fest gs w/ irregular seams of po, trace cp	<5		0.5		3337		6		84		<1	4	115	0.13	<5
25.7	8682	Northern Copper	R	C	5.1	TP	Gs w/ cg radiating actinolite, mag, garnet, epidote	<5		<0.1		23		5		4170		<1	18	15	1.77	<5
25.8	8684	Northern Copper	R	C	1.5	TP	Gs w/ po, mag, cp	17		10.3		1.70	*	4		1043		<1	2	54	0.11	<5
25.9	8681	Northern Copper	R	C	6.5	TP	Fg gs, no apparent sulf	<5		<0.1		37		5		160		<1	40	26	3.08	<5
25.10	8683	Northern Copper	R	C		TP	Gs w/ irreg seams & knots of py, mag, lesser cp	<5		1.1		1838		6		6500		<1	2	28	0.14	<5
25.11	3714	Northern Copper	R	C	1.8	TP	Layer of msv sulf in gs	7		6.3		1.40	*	12		837		2	12	68	0.59	<5
25.12	3715	Northern Copper	R	C	1.5	TP	Sil gs w/ sl, cp, py	12		3.3		4028		6		2.40	*	5	7	8	0.19	<5
25.13	3716	Northern Copper	R	C	1	TP	Gs w/ cp, mag	13		2.9		5221		8		1.18	*	<1	4	7	0.43	<5
25.14	3717	Northern Copper	R	C	5	TP	Msv sulf & skarn in gs sc	9		2.2		5342		10		147		2	10	42	0.33	<5
25.15	267	Northern Copper	R	Rep	2.2	TP	Gs w/ dissem & msv sulf	12		1.1		3855		20		179		<1	4	97	0.18	<5
25.16	3725	Northern Copper	R	C	1.2	TP	Msv sulf lens in gs sc	165		1.3		2709		9		209		<1	8	20	0.85	<5
25.17	8685	Northern Copper	R	C	2	TP	Gossany msv sulf lens	10		4.4		8843		13		818		<1	10	51	0.56	<5
25.18	3726	Northern Copper	R	C	2.6	TP	Skarn mineralization in gs	7		0.7		1407		14		7843		<1	4	30	0.39	<5
25.19	266	Northern Copper	R	Rep	2.5	TP	Alt sil ar w/ dissem sulf	<5		1.2		1429		84		7961		<1	5	13	0.33	8
25.20	413	Northern Copper	R	SC	3@.25	TP	Blebs & dissem po & cp in blocky gs	<5		<0.1		804		5		104		<1	6	7	0.48	<5
25.20	414	Northern Copper	R	G	0.4	RC	Gs w/ blebs of cp	<5		0.8		4507		7		64		2	5	14	0.33	6
25.21	2831	Northern Copper	R	C	2	TP	Weathered gs w/ cp	<5		3.3		1774		10		9398		<1	2	5	0.56	<5
25.22	8686	Northern Copper	R	C	3.4	TP	Sil gs w/ po, mag, lesser cp	6		1.9		3830		9		121		<1	6	19	0.21	<5
25.23	104	Northern Copper	R	G	0.5	TP	Fest gs w/ py, cp	18		2.6		8111		13		118		<1	13	44	0.13	<5
25.23	105	Northern Copper	R	S	0.5	MD	Msv po, py, cp	6		7.1		1.70	*	10		341		<1	11	55	0.06	<5
25.24	106	Northern Copper	R	SC	20@1	TP	Gs w/ sulf zones of cp, py, po	28		6.0		5657		12		191		<1	3	5	0.16	<5
25.25	8687	Northern Copper	R	C		TP	Sil gs w/ po, lesser cp, locally skarnified	<5		1.1		947		6		83		<1	2	3	0.27	<5
25.26	3727	Northern Copper	R	C	3.3	TP	Gs w/ skarn mineralization & minor cp	<5		1.3		1179		5		43		<1	1	4	0.25	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
23.18	3902	RD8	2125	*	<5	4.33	0.2	48	8.15	9	0.021	0.07	13	2.76	1217	0.20	11	<5	13	3	*	146	<10	0.10	166	<20			
23.18	3903	RD8	908	*	<5	3.02	15.3	81	>10	6	0.467	0.25	4	0.61	394	<0.01	35	27	<5	70	*	22	<10	<0.01	425	<20			
23.18	8788	RD8	<1		<5	<0.01	<0.2	<1	<0.01	<2	0.237	<0.01	<1	<0.01	<1	<0.01	<1	<5	<5	28	*	<1	<10	<0.01	<1	<20			
23.18	8789	RD8	5		<5	1.71	5.1	122	>10	4	0.43	0.15	3	0.09	150	<0.01	12	12	<5	65	*	28	<10	<0.01	132	<20			
24.1	111	Towers Creek	177	*	<5	0.99	0.3	93	13.38	<2	0.471	0.07	2	2.05	575	0.03	<1	<5	14	<20		18	<10	0.30	215	<20			
24.1	112	Towers Creek	173	*	<5	1.53	<0.2	85	12.61	<2	0.297	0.05	3	2.81	879	0.01	3	<5	20	<20		22	<10	0.30	245	<20			
24.1	113	Towers Creek	503	*	<5	0.71	<0.2	72	9.50	<2	0.368	0.17	2	1.79	533	0.02	1	<5	7	<20		6	<10	0.28	132	<20			
24.1	270	Towers Creek	196	*	<5	2.76	0.3	98	11.19	<2	0.364	0.10	3	2.46	940	0.03	4	<5	15	<20		36	<10	0.29	226	<20			
24.1	271	Towers Creek	579	*	<5	0.97	0.4	63	19.33	<2	1.396	0.20	2	0.70	257	0.02	<1	<5	5	<20		11	<10	0.24	80	<20			
24.1	272	Towers Creek	97	*	<5	3.23	0.6	92	20.77	<2	0.759	0.06	2	1.66	843	0.02	<1	<5	12	<20		53	<10	0.26	156	<20			
24.2	2345	Towers Creek	637	*	<5	1.37	<0.2	45	29.80	<2	0.512	0.09	<1	0.17	221	0.01	<1	<5	<5	<20		33	<10	0.27	23	<20			
24.2	2346	Towers Creek	94		<5	0.56	1.0	27	4.53	<2	0.262	0.07	7	0.81	942	0.02	3	<5	<5	<20		23	<10	0.10	67	<20			
24.2	2347	Towers Creek	270	*	<5	1.79	<0.2	163	9.78	<2	0.539	0.03	2	0.37	236	0.06	7	<5	10	<20		18	<10	0.47	153	<20			
24.2	9558	Towers Creek	1403	*	<5	2.41	<0.2	57	19.63	<2	0.385	0.12	<1	0.36	368	0.02	3	<5	<5	<20		43	<10	0.44	48	<20			
24.2	9559	Towers Creek	66		<5	0.44	<0.2	24	2.90	<2	0.087	0.05	6	0.68	600	0.02	4	<5	<5	<20		21	<10	0.10	52	<20			
25.1	2832	Northern Copper	486	*	14	0.67	3.2	19	18.22	<2	0.000	0.12	<1	0.92	793	0.08	<1	<5	<5	<20		18	<10	0.08	45	<20			
25.1	2833	Northern Copper	115	*	20	1.69	5.6	<1	20.70	<2	0.061	0.07	<1	0.59	992	0.08	<1	<5	<5	<20		29	<10	0.04	33	<20			
25.2	415	Northern Copper	201	*	6	0.97	6.5	22	30.05	2	0.167	0.07	<1	0.71	637	0.01	<1	<5	<5	<20		16	<10	0.03	28	<20			
25.2	416	Northern Copper	700	*	16	0.57	6.0	3	21.01	3	0.053	0.22	<1	1.52	1052	0.02	<1	<5	<5	<20		8	<10	0.07	56	<20			
25.2	417	Northern Copper	238	*	17	0.08	6.5	38	27.94	2	0.052	0.04	<1	0.53	270	0.01	<1	<5	<5	<20		6	<10	0.02	20	<20		7	2
25.3	3723	Northern Copper	100	*	<5	2.03	33.3	60	6.20	<2		<0.01	<1	0.16	2285	0.01	<1	<5	<5	<20		25	<10	<0.01	2	<20			
25.3	3724	Northern Copper	62	*	<5	2.24	9.4	48	5.03	<2		0.01	<1	0.17	2423	0.02	<1	<5	<5	<20		15	<10	<0.01	3	<20			
25.4	107	Northern Copper	699	*	<5	1.06	3.7	27	6.84	<2	<0.01	0.01	2	0.07	1202	0.01	<1	<5	<5	<20		4	<10	<0.01	3	<20			
25.4	108	Northern Copper	549	*	<5	3.33	56.6	33	6.35	<2	0.048	0.02	5	0.36	3005	0.03	<1	<5	<5	<20		55	<10	0.03	13	<20			
25.4	268	Northern Copper	<10	*	<5	0.38	0.7	36	28.88	<2	<0.01	<0.01	<1	0.07	461	0.01	<1	<5	<5	<20		2	<10	<0.01	<1	<20			
25.5	8677	Northern Copper	79	*	<5	1.08	2.8	31	5.56	<2	0.015	0.01	<1	0.14	1031	0.03	<1	<5	<5	<20		6	<10	0.02	5	<20			
25.6	8676	Northern Copper	23	*	<5	0.74	0.6	25	22.31	<2	0.017	<0.01	<1	0.13	954	0.02	<1	<5	<5	<20		5	<10	<0.01	2	<20			
25.7	8682	Northern Copper	371	*	<5	1.64	19.9	60	4.08	<2	0.014	0.09	<1	1.13	2000	0.12	7	<5	6	<20		52	<10	0.18	68	<20			
25.8	8684	Northern Copper	56	*	13	1.44	7.2	27	6.90	<2	0.022	<0.01	<1	0.12	1470	0.02	<1	<5	<5	<20		5	<10	<0.01	2	<20			
25.9	8681	Northern Copper	1371	*	<5	1.08	0.2	77	7.06	<2	<0.01	0.41	<1	2.24	2324	0.13	11	<5	8	<20		25	<10	0.20	120	<20			
25.10	8683	Northern Copper	37	*	<5	2.75	32.3	31	6.31	<2	0.016	<0.01	<1	0.06	2538	0.01	<1	<5	<5	<20		16	<10	<0.01	4	<20			
25.11	3714	Northern Copper	16	*	8	0.22	8.0	22	40.81	2		<0.01	<1	0.29	459	<0.01	<1	<5	<5	<20		10	<10	0.03	23	<20			
25.12	3715	Northern Copper	509	*	<5	2.59	107.2	168	5.19	<2		<0.01	<1	0.04	2096	0.01	<1	<5	<5	<20		11	11	0.03	8	22			
25.13	3716	Northern Copper	887	*	<5	0.68	50.8	89	9.57	<2		0.04	<1	0.33	1664	0.08	<1	<5	<5	<20		10	<10	0.05	22	<20			
25.14	3717	Northern Copper	20	*	<5	0.98	1.3	33	38.92	<2		<0.01	<1	0.09	462	0.02	<1	<5	<5	<20		11	<10	0.03	13	<20			
25.15	267	Northern Copper	49	*	<5	2.21	1.1	50	26.19	<2	<0.01	<0.01	7	0.10	1966	0.02	<1	<5	<5	<20		11	<10	0.03	8	<20			
25.16	3725	Northern Copper	76	*	<5	1.44	0.8	44	26.37	<2		0.05	<1	0.49	970	0.13	<1	<5	<5	<20		37	<10	0.09	32	<20			
25.17	8685	Northern Copper	<10	*	<5	0.12	4.7	<1	49.22	3	0.019	<0.01	<1	0.29	373	<0.01	<1	<5	<5	<20		11	<10	<0.01	11	<20			
25.18	3726	Northern Copper	113	*	<5	2.52	29.1	45	9.36	<2		0.05	<1	0.19	2500	0.05	<1	<5	<5	<20		19	<10	0.02	9	<20			
25.19	266	Northern Copper	29	*	<5	3.45	34.1	86	5.33	<2	0.014	0.03	1	0.11	3380	0.03	<1	<5	<5	<20		29	<10	0.01	6	<20			
25.20	413	Northern Copper	36	*	<5	1.27	0.4	50	6.82	<2	0.012	0.01	<1	0.19	1412	0.03	1	<5	<5	<20		26	<10	0.10	23	<20			
25.20	414	Northern Copper	<10	*	<5	5.92	0.4	60	23.95	3	<0.01	<0.01	<1	0.02	2383	<0.01	<1	<5	<5	<20		4	<10	<0.01	9	<20			
25.21	2831	Northern Copper	4816	*	<5	0.43	43.0	18	29.04	2	0.042	0.10	<1	0.20	1597	0.03	<1	<5	<5	<20		8	<10	0.05	25	<20			
25.22	8686	Northern Copper	<10	*	<5	0.68	0.8	76	27.03	<2	0.017	<0.01	<1	0.09	999	0.01	<1	<5	<5	<20		9	<10	0.02	8	<20			
25.23	104	Northern Copper	1518	*	<5	0.12	0.6	172	44.97	<2	0.019	<0.01	<1	0.02	117	<0.01	<1	<5	<5	<20		<1	<10	<0.01	3	<20			
25.23	105	Northern Copper	<10	*	<5	<0.01	2.1	88	46.28	<2	0.029	<0.01	2	0.03	116	<0.01	<1	<5	<5	<20		<1	<10	<0.01	4	<20			
25.24	106	Northern Copper	58	*	<5	0.69	1.3	42	24.74	<2	<0.01	<0.01	2	0.08	1581	<0.01	<1	<5	<5	<20		4	<10	0.01	8	<20			
25.25	8687	Northern Copper	66	*	<5	1.29	0.5	57	19.94	<2	<0.01	<0.01	<1	0.06	1252	0.01	<1	<5	<5	<20		14	<10	0.03	7	<20			
25.26	3727	Northern Copper	36	*	<5	0.79	0.2	28	4.62	<2		<0.01	<1	0.05	595	<0.01	<1	<5	<5	<20		21	<10	0.03	4	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
25.27	8657	Northern Copper	R	SC	6@.5	OC	Dark gray ar	6		0.1		540		8		206		28	19	3	0.44	7
25.28	8658	Northern Copper	R	Rep	4	OC	Alt, fest, gossany br	10		0.8		1173		26		389		5	5	<1	0.07	5
25.29	2809	Northern Copper	R	Rep	1.8	OC	Ar	<5		0.2		199		12		59		31	45	8	1.01	<5
25.30	3667	Northern Copper	R	S		OC	Msv sulf w/ po & cp	11		4.4		9087		12		379		2	34	112	0.42	<5
25.31	3677	Northern Copper	R	S		MD	Msv sulf w/ po & cp w/ minor chl sc	24		8.2		2.20	*	17		1164		<1	21	157	0.55	<5
25.32	3684	Northern Copper	R	C	5.2	UW	Chl sc w/ minor py	<5		<0.1		113		11		166		3	48	26	2.92	<5
25.32	3685	Northern Copper	R	C	0.6	UW	Msv sulf layer in chl sc	10		11.5		3.10	*	15		1427		2	20	108	0.81	<5
25.33	3686	Northern Copper	R	C	1.9	UW	Msv sulf layer w/ interlayered chl sc	14		3.8		1.01	*	17		639		3	20	147	1.02	<5
25.34	3687	Northern Copper	R	C	2.2	UW	Sil zone w/ sulf veinlets	<5		0.3		860		12		217		3	13	39	2.88	<5
25.35	3806	Northern Copper	R	C	1.4	UW	Msv po, cp in chl sc	29		9.3		2.47	*	7		723		<1	18	166	0.76	<5
25.35	3807	Northern Copper	R	C	5	UW	Chl sc in hanging wall of msv sulf layer	<5		0.5		662		3		268		2	50	32	2.98	<5
25.36	8659	Northern Copper	R	C	1.5	UW	Msv sulf of po & lesser cp	19		6.2		1.93	*	13		1302		2	11	139	0.44	<5
25.37	3808	Northern Copper	R	C	0.5	UW	Msv po w/ cp in chl sc	25		7.2		1.50	*	9		887		3	23	117	0.80	<5
25.38	3665	Northern Copper	R	G		RC	Sil gs w/ cp, po, mal	12		<0.1		1090		17		120		3	5	9	0.25	8
25.38	3666	Northern Copper	R	S		OC	Alt ar w/ minor cp in sil zones	67		32.6		3.50	*	39		299		5	7	160	0.52	17
25.39	3809	Northern Copper	R	C	0.8	UW	Msv po w/ cp in chl sc	26		8.7		1.75	*	8		1156		4	32	97	1.61	<5
25.40	3810	Northern Copper	R	C	2.7	UW	Sil phy	<5		<0.1		171		<2		369		22	63	7	1.34	<5
25.40	3811	Northern Copper	R	C	0.4	UW	Msv po w/ cp in chl sc	28		10.5		1.99	*	9		1630		7	40	206	1.34	<5
25.40	3812	Northern Copper	R	C		UW	Chl sc w/ minor sulf	<5		0.2		310		3		647		3	36	27	3.25	<5
25.41	3813	Northern Copper	R	C	1.3	UW	Chl sc & gs w/ patchy msv po, cp	16		9.9		1.96	*	7		1196		14	47	272	2.05	<5
25.42	3814	Northern Copper	R	C	4.8	UW	Sil phy w/ minor sulf	13		0.2		240		3		483		33	29	4	1.02	<5
25.43	3815	Northern Copper	R	C	2.2	UW	Msv gs w/ minor sulf	<5		<0.1		88		<2		90		2	15	8	1.02	<5
25.44	8709	Northern Copper	R	C	0.6	UW	Fault zone w/ msv py, po	<5		0.4		2764		12		200		<1	24	111	0.76	<5
25.44	8710	Northern Copper	R	C	2	UW	Gs w/ py, po, trace cp	6		1.0		3313		11		584		2	9	54	0.09	<5
26.1	6371	Portage Bay Pit	R	S		FL	Road metal w/ msv sulf of cp, sl, gn, aspy	0.296	*	40.0		1227		2.22	*	3.69	*	4	31	135	0.78	>10000
26.2	2803	Portage Bay Pit	R	Rep	20	TP	Diorite w/ po	16		0.7		192		52		104		4	27	16	1.41	17
26.2	2804	Portage Bay Pit	R	Rep	12	TP	Diorite w/ po	<5		0.2		207		19		40		11	9	16	0.83	13
26.2	2805	Portage Bay Pit	R	Rep	8	TP	Diorite w/ po	6		0.2		70		20		78		4	24	13	1.62	7
26.2	2806	Portage Bay Pit	R	Rep	8	TP	Diorite w/ po	7		0.3		184		23		38		5	23	17	0.85	<5
26.2	3673	Portage Bay Pit	R	S		TP	Fault in diorite w/ banded sulf, 20% po & cp	74		1.6		920		41		88		4	35	53	0.70	17
26.2	3674	Portage Bay Pit	R	S		TP	Fg sc in shear w/ 20% sulf, in diorite	3271		13.9		3025		4708		1.40	*	4	30	51	0.50	9762
26.2	3675	Portage Bay Pit	R	S		RC	Diorite w/ bands of msv sulf	36		1.6		2067		41		77		37	74	89	0.74	38
26.2	3678	Portage Bay Pit	R	S		TP	Diorite w/ seam of mo & dissem po & cp	16		0.6		766		14		41		855	17	27	0.64	5
26.2	3679	Portage Bay Pit	R	S		TP	Fault gouge in diorite	7		0.3		178		19		98		19	28	17	1.98	15
26.2	3680	Portage Bay Pit	R	S		TP	Diorite w/ sulf-bearing seams	817		2.0		1738		20		1.20	*	56	36	58	1.34	5
26.2	3681	Portage Bay Pit	R	S		TP	Sil zone in diorite w/ concentrated sulf	9		0.4		822		12		67		7	65	44	1.08	<5
26.2	3682	Portage Bay Pit	R	S		TP	Calc-silicate w/ minor sulf	<5		0.3		132		386		89		5	1365	33	0.43	15
26.2	6368	Portage Bay Pit	R	Rep		RC	Hornfels w/ po & cp	23		0.8		940		15		16		12	42	60	0.83	<5
26.2	6369	Portage Bay Pit	R	S		RC	Diorite w/ dissem po, py, & cp	8		<0.1		343		5		12		10	19	26	0.85	<5
27.1	3912	Ironton	R	S		OC	Alt volc w/ banded & dissem sulf	7		<0.1		95		3		93		3	38	49	2.45	<5
27.1	3913	Ironton	R	G		OC	Gs w/ po & minor cp	6		<0.1		281		3		36		2	57	56	1.22	<5
27.2	3908	Ironton	R	Rep	15	OC	Qz-cc-chl sc w/ banded py	8		0.2		203		4		89		3	51	32	2.79	<5
27.2	3909	Ironton	R	C	5.1	OC	Gs to chl sc w/ py	7		0.2		129		4		65		2	42	39	2.06	<5
27.2	3910	Ironton	R	S		OC	Gs & chl sc w/ py	14		0.2		178		4		70		2	59	44	1.44	<5
27.2	3911	Ironton	R	S		TP	Alt volc w/ dissem & banded py	9		<0.1		91		4		86		4	58	46	1.87	<5
27.2	8793	Ironton	R	Rep		OC	Gs	8		<0.1		169		3		64		2	56	38	2.14	<5
27.2	8794	Ironton	R	Rep		OC	Msv chl sc	15		0.2		186		3		72		3	51	38	2.21	<5
27.2	8795	Ironton	R	Rep		OC	Chl sc	8		<0.1		179		<2		89		3	66	50	2.17	<5
27.2	8796	Ironton	R	SC	8@1	UW	Meta volc w/ dissem py	18		0.2		139		4		48		<1	53	41	0.96	<5

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Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
25.27	8657	Northern Copper	293	*	<5	0.25	0.3	91	1.97	<2	0.019	0.04	2	0.32	164	0.02	1	<5	<5	<20		3	<10	0.03	116	<20			
25.28	8658	Northern Copper	205	*	<5	0.07	<0.2	22	>10	<2	0.014	0.02	<1	0.04	235	<0.01	<1	<5	<5	<20		1	<10	<0.01	6	<20			
25.29	2809	Northern Copper	168	*	<5	0.43	<0.2	134	3.12	<2	<0.01	0.03	3	0.73	528	0.08	3	<5	<5	<20		8	<10	0.06	248	<20			
25.30	3667	Northern Copper	16	*	<5	0.15	<0.2	15	>10	<2	0.013	0.06	<1	0.30	282	0.01	<1	<5	<5	<20		3	<10	<0.01	5	<20			
25.31	3677	Northern Copper	119	*	<5	0.42	3.0	20	>10	<2	0.031	0.07	<1	0.39	454	0.03	<1	<5	<5	<20		6	<10	0.02	14	<20			
25.32	3684	Northern Copper	1101	*	<5	1.94	<0.2	85	5.14	<2	0.099	0.35	7	2.28	1003	0.05	1	<5	<5	<20		26	<10	0.07	90	<20			
25.32	3685	Northern Copper	237	*	<5	0.71	4.9	29	>10	<2	0.149	0.13	<1	0.56	516	0.03	<1	<5	<5	<20		8	<10	0.02	25	<20			
25.33	3686	Northern Copper	263	*	<5	1.41	0.5	32	>10	<2	1.772	0.11	2	0.74	1075	0.04	<1	<5	<5	<20		15	<10	0.03	34	<20			
25.34	3687	Northern Copper	273	*	<5	1.54	<0.2	19	>10	5	0.275	0.04	27	2.34	658	0.06	2	<5	7	<20		25	<10	0.04	94	<20			
25.35	3806	Northern Copper	335		<5	0.36	3.6	23	>10	<2	1.360	0.07	2	0.62	585	0.03	<1	<5	<5	25		4	14	0.02	28	<20			
25.35	3807	Northern Copper	986		<5	0.29	0.7	88	6.26	5	4.630	0.22	6	2.46	1082	0.03	<1	<5	<5	157		8	11	0.06	89	<20			
25.36	8659	Northern Copper	296	*	<5	0.36	1.8	14	>10	<2	2.387	0.05	<1	0.31	337	0.02	2	<5	<5	<20		3	<10	0.01	14	<20			
25.37	3808	Northern Copper	359		<5	0.45	4.8	18	>10	<2	0.073	0.12	3	0.60	647	0.03	<1	<5	<5	52		5	14	0.03	37	<20			
25.38	3665	Northern Copper	22	*	<5	7.70	<0.2	52	>10	<2	0.010	0.01	<1	0.04	2075	<0.01	<1	<5	<5	<20		3	<10	<0.01	5	<20			
25.38	3666	Northern Copper	1809	*	<5	0.29	<0.2	104	>10	<2	0.062	0.37	<1	0.29	315	0.08	2	<5	<5	<20		4	<10	0.07	50	<20			
25.39	3809	Northern Copper	447		<5	0.78	5.6	37	>10	<2	0.870	0.17	2	1.26	756	0.04	<1	<5	<5	22		8	14	0.04	65	<20			
25.40	3810	Northern Copper	5084		<5	1.07	2.0	187	2.30	<2	0.720	0.32	3	1.02	669	0.04	<1	<5	<5	<20		20	<10	0.09	213	<20			
25.40	3811	Northern Copper	731		<5	0.70	7.3	34	>10	<2	0.500	0.27	2	0.98	625	0.06	<1	<5	<5	58		6	20	0.06	62	<20			
25.40	3812	Northern Copper	1075		<5	0.52	1.9	67	6.83	5	2.280	0.30	6	2.63	981	0.04	<1	<5	5	180		12	<10	0.07	104	<20			
25.41	3813	Northern Copper	319		<5	0.31	6.3	90	>10	2	7.860	0.10	2	1.59	677	0.05	<1	<5	5	11		5	13	0.05	171	<20			
25.42	3814	Northern Copper	2420		<5	0.28	2.2	169	8.39	2	2.170	0.21	5	0.74	362	0.03	<1	<5	<5	133		13	<10	0.09	292	<20			
25.43	3815	Northern Copper	495		<5	1.01	<0.2	53	6.84	<2	1.030	0.08	1	0.80	693	0.08	<1	<5	<5	291		21	<10	0.19	51	<20			
25.44	8709	Northern Copper	162		<5	0.25	2.6	25	>10	<2	0.663	0.04	1	0.60	418	0.04	<1	<5	<5	23		3	<10	0.02	24	<20			
25.44	8710	Northern Copper	<10		<5	2.05	3.9	68	>10	<2	0.581	<0.01	<1	0.11	999	<0.01	<1	<5	<5	10		7	<10	<0.01	7	<20			
26.1	6371	Portage Bay Pit	570	*	11	0.26	530.6	54	10.00	<2	2.948	0.32	3	0.19	473	<0.01	<1	71	<5	<4	*	6	27	0.04	16	<4	*		
26.2	2803	Portage Bay Pit	526	*	<5	1.23	0.6	63	2.91	<2	0.075	0.19	9	0.56	369	0.10	1	<5	<5	<4	*	160	<10	0.14	46	6	*		
26.2	2804	Portage Bay Pit	1089	*	<5	1.50	0.2	40	1.85	<2	0.026	0.28	10	0.17	209	0.09	<1	<5	<5	<4	*	125	<10	0.12	34	<4	*		
26.2	2805	Portage Bay Pit	627	*	<5	0.86	<0.2	64	2.85	<2	0.027	0.24	5	0.80	499	0.09	1	<5	<5	<4	*	79	<10	0.16	40	<4	*		
26.2	2806	Portage Bay Pit	836	*	<5	1.12	<0.2	44	2.16	<2	0.016	0.23	10	0.19	147	0.10	1	<5	<5	<4	*	115	<10	0.15	34	4	*		
26.2	3673	Portage Bay Pit	98	*	<5	1.21	<0.2	74	>10	<2	0.039	0.09	7	0.14	245	0.04	<1	<5	<5	7	*	80	<10	0.11	21	6	*		
26.2	3674	Portage Bay Pit	203	*	<5	0.78	173.0	77	>10	<2	0.820	0.18	<1	0.26	469	<0.01	1	10	<5	11	*	15	<10	0.04	11	<4	*		
26.2	3675	Portage Bay Pit	253	*	<5	0.87	<0.2	44	>10	<2	0.025	0.24	13	0.18	167	0.03	2	<5	<5	6	*	70	<10	0.09	20	<4	*		
26.2	3678	Portage Bay Pit	485	*	<5	1.09	0.3	57	2.86	<2	0.057	0.20	9	0.12	183	0.08	1	<5	<5	<4	*	101	<10	0.13	32	<4	*		
26.2	3679	Portage Bay Pit	624	*	<5	1.84	<0.2	61	3.66	<2	0.060	0.21	6	1.34	842	0.06	1	<5	<5	<4	*	101	<10	0.13	50	<4	*		
26.2	3680	Portage Bay Pit	19	*	<5	3.30	57.5	117	>10	<2	1.405	0.02	7	0.21	1789	0.02	1	<5	<5	5	*	225	<10	0.12	35	<4	*		
26.2	3681	Portage Bay Pit	447	*	<5	0.59	<0.2	67	3.90	<2	0.015	0.21	4	0.51	293	0.10	1	<5	<5	<4	*	39	<10	0.19	42	<4	*		
26.2	3682	Portage Bay Pit	<10	*	<5	0.54	<0.2	537	2.10	<2	0.037	<0.01	<1	1.30	222	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	5	<4	*		
26.2	6368	Portage Bay Pit	54	*	<5	1.39	0.3	74	10.00	<2	0.022	0.05	9	0.08	325	0.02	<1	<5	<5	<4	*	101	<10	0.13	20	13	*		
26.2	6369	Portage Bay Pit	600	*	<5	0.98	0.2	49	3.99	<2	0.011	0.16	9	0.15	195	0.05	2	<5	<5	<4	*	107	<10	0.13	23	11	*		
27.1	3912	Ironton	196	*	<5	0.85	0.4	155	>10	<2	0.513	0.04	1	2.01	929	0.06	7	<5	<5	<20		34	<10	0.55	110	<20			
27.1	3913	Ironton	827	*	<5	1.07	0.3	65	6.33	<2	0.162	0.06	1	0.92	389	0.05	5	<5	<5	<20		13	<10	0.64	76	<20			
27.2	3908	Ironton	2483	*	<5	4.05	0.5	71	8.93	9	0.133	0.11	4	1.89	1117	0.03	8	<5	12	<20		136	<10	0.04	132	<20			
27.2	3909	Ironton	3943	*	<5	0.88	0.3	109	7.97	<2	0.636	<0.01	1	1.73	689	0.04	9	<5	<5	<20		10	<10	0.58	133	<20			
27.2	3910	Ironton	1184	*	<5	1.60	0.4	101	>10	<2	0.794	0.04	1	1.09	706	0.05	6	<5	<5	<20		15	<10	0.47	93	<20			
27.2	3911	Ironton	1050	*	<5	0.98	0.5	119	>10	<2	1.665	0.02	<1	1.54	918	0.04	5	<5	<5	<20		13	<10	0.61	85	<20			
27.2	8793	Ironton	933	*	<5	3.45	0.4	112	7.60	<2	0.420	0.05	2	1.71	792	0.05	7	<5	8	<20		31	<10	0.28	104	<20			
27.2	8794	Ironton	2406	*	<5	4.32	0.3	123	6.17	<2	1.217	0.10	2	1.12	638	0.02	5	<5	<5	<20		35	<10	0.29	88	<20			
27.2	8795	Ironton	3291	*	<5	1.41	0.4	113	>10	<2	1.693	0.07	1	1.94	969	0.05	8	<5	6	<20		12	<10	0.49	120	<20			
27.2	8796	Ironton	2263	*	<5	1.41	0.5	76	>10	<2	2.115	0.03	1	0.28	297	0.04	8	<5	6	<20		10	<10	0.50	100	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
28.1	109	Salt Chuck	R	S	0.4	OC	Sil gs w/ py, po, cp	61		9.9		7.10	*	7		194		3	<1	8	0.70	<5
28.1	110	Salt Chuck	R	C	0.9	OC	Fest sil gs w/ py, po, cp	31		3.4		1.80	*	5		48		2	<1	2	0.16	<5
28.1	269	Salt Chuck	R	Rep	1	OC	Sil gs w/ cp	41		3.4		3.00	*	8		102		<1	2	18	0.76	<5
28.1	279	Salt Chuck	R	C	2.7	OC	Fest sc, chert w/ py, cp	26		3.1		5500		11		54		12	2	3	0.44	9
28.1	280	Salt Chuck	R	C	1.1	OC	Sil, fest zone w/ cp	128		4.3		1.40	*	8		73		8	1	4	0.39	<5
28.1	513	Salt Chuck	R	C	1.3	OC	Sil andesite w/ cp & py	26		2.8		1.10	*	4		53		2	3	5	0.77	<5
28.2	114	Salt Chuck	R	C	1.2	OC	Sil gs sc w/ fg py	59		0.3		30		21		78		4	4	4	0.07	54
28.2	115	Salt Chuck	R	C	0.5	OC	Qz vn w/ po & sl in bands & blebs	8		0.6		264		50		5898		<1	20	15	0.05	11
28.2	273	Salt Chuck	R	Rep	0.5	RC	Qz vn	64		2.2		1775		200		3160		<1	16	3	0.06	24
28.2	9647	Salt Chuck	R	C	0.075	OC	Qz vn w/ py, sl in sc	<5		0.5		55		57		2.30	*	<1	5	13	0.63	13
29.1	60	Portage Creek	R	S		RC	Hbl-rich diorite w/ py & cp	<5		<0.1		233		10		92		2	6	13	3.53	<5
29.1	61	Portage Creek	R	G		RC	Hbl-rich diorite w/ py & cp	<5		<0.1		262		9		94		1	2	17	3.69	<5
29.1	62	Portage Creek	R	G		RC	Hbl-rich diorite w/ py & cp	<5		<0.1		925		9		101		2	2	31	3.25	<5
29.1	136	Portage Creek	R	SC	27@1	OC	Hbl diorite w/ po & cp	<5		2.1		311		50		134		2	2	23	3.91	6
29.1	137	Portage Creek	R	G	0.3	RC	Green-gray volc w/ fg dissem po, cp	6		0.3		708		17		139		5	7	30	3.77	8
29.1	138	Portage Creek	R	SC	15@1	OC	Hornblendite w/ cp, py	5		0.4		1853		11		143		2	3	48	4.07	<5
29.1	139	Portage Creek	R	SC	15@1	OC	Hornblendite w/ cp, py	<5		0.6		4666		9		223		2	4	51	4.39	<5
29.1	140	Portage Creek	R	SC	15@1	OC	Hornblendite w/ sulf	<5		0.2		1111		8		151		2	4	30	5.01	<5
29.1	141	Portage Creek	R	C	2.5	OC	Hornblendite w/ py, cp	<5		0.4		2692		8		221		2	4	225	4.99	11
29.1	232	Portage Creek	R	S		RC	Hbl-rich diorite w/ py	<5		<0.1		81		11		96		<1	2	9	2.28	<5
29.1	233	Portage Creek	R	Rep	1.5	OC	Hbl-rich diorite w/ py & cp	<5		<0.1		215		7		91		<1	1	20	2.48	<5
29.1	2367	Portage Creek	R	SC	40@2	OC	Hornblendite w/ sulf	5		<0.1		2597		6		164		2	5	47	3.77	<5
29.1	2368	Portage Creek	R	SC	12@1	OC	Hornblendite w/ sulf	2		0.2		4554		7		214		2	8	57	4.27	<5
29.1	2369	Portage Creek	R	S	0.5	OC	Hornblendite w/ cp, mal, & py	2		0.3		4294		4		194		4	7	56	3.31	<5
29.1	9598	Portage Creek	R	C	6.8	OC	Hbl diorite w/ dissem po, cp	<5		<0.1		91		11		86		2	2	18	3.30	<5
29.1	9599	Portage Creek	R	SC	10@.5	OC	Hbl diorite w/ dissem po, cp	<5		<0.1		239		7		96		2	2	15	3.22	<5
29.1	9600	Portage Creek	R	SC	18@1	OC	Hbl diorite w/ dissem po	<5		0.2		22		9		64		<1	3	27	2.49	<5
30.1	915	Upper Taylor Creek	S					26		1.2		268		42		154		<1	52	52	3	40.00
30.1	916	Upper Taylor Creek	S					8		<0.2		23		16		47		<1	11	7	2	<5
30.1	917	Upper Taylor Creek	S					<5		<0.2		22		14		52		2	13	9	2	9.00
30.1	918	Upper Taylor Creek	SS					11		<0.2		88		35		232		2	36	34	2	23.00
30.1	6337	Upper Taylor Creek	SS					98		0.9		201		96		431		1	53	52	3	51.00
30.2	912	Upper Taylor Creek	S					48		0.6		471		110		270		5	71	82	4	76.00
30.2	913	Upper Taylor Creek	S					12		0.6		91		33		125		1	33	19	2	30.00
30.2	914	Upper Taylor Creek	S					8		0.8		84		11		173		<1	27	13	3	12.00
30.2	6333	Upper Taylor Creek	R	CC	0.6	OC	Sil lens w/ fg py in graphitic slate	192		3.3		65		453		2518		2	48	36	3.07	303
30.2	6334	Upper Taylor Creek	R	CC	0.4	OC	Sil py-rich layer in chl sc	132		9.9		210.0		116		496		4	66	49	1	723
30.2	6335	Upper Taylor Creek	R	CC	3.0	OC	Sil py-rich layer in chl sc	197		19.2		139		335		479		5	56	43	1.70	518
30.2	6336	Upper Taylor Creek	R	Rep	0.5	OC	Msv py layer in chl sc/phy	94		9.0		166		213		478		2	86	69	2.29	466
31.1	51	Taylor Creek	R	Rep	0.8	OC	Gossan in ls	129		6.9		81		1114		4417		3	5	2	0.05	318
31.1	52	Taylor Creek	R	G		MD	Dol ls w/ py, sl, & gn	183		93.0		453		0.78	*	5.10	*	3	49	15	0.02	437
31.1	53	Taylor Creek	R	Rep	0.7	OC	Dol ls w/ py, sl, & gn	45		25.9		16		7.72	*	6.90	*	1	13	3	0.01	417
31.1	54	Taylor Creek	R	S		MD	Dol ls w/ sulf	99		>500		70		7217		2.10	*	2	3	<1	0.03	94
31.1	225	Taylor Creek	R	Rep	1.5	OC	Gray ls w/ qz & py	176		10.1		69		2431		9441		4	10	3	0.08	179
31.1	226	Taylor Creek	R	G		TP	Gossan	903		160.0		47		9.69	*	3.00	*	9	9	<1	0.07	1362
31.1	227	Taylor Creek	R	RC		TP	Dol ls w/ sulf	32		4.1		5		2333		2.40	*	1	5	<1	0.04	69
32.1	548	Kane Peak	SS					<5		<0.1		15		3		39		1	9	10	1.14	<5
32.2	547	Kane Peak	SS					<5		<0.1		60		3		34		<1	37	19	0.57	<5
32.3	550	Kane Peak	R	G	2	OC	Fest pyroxenite w/ po & 20% olivine	<5		0.4		1594		6		19		<1	122	33	0.14	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
28.1	109	Salt Chuck	469	*	<5	0.37	0.6	33	16.60	<2	0.087	0.13	5	0.13	116	0.02	8	<5	<5	<20		65	<10	0.05	6	<20			
28.1	110	Salt Chuck	164	*	<5	0.07	<0.2	8	5.94	<2	0.038	0.04	7	<0.01	20	0.04	3	<5	<5	<20		10	<10	0.06	5	<20			
28.1	269	Salt Chuck	107	*	<5	0.14	0.3	42	6.96	<2	0.037	0.04	11	0.20	139	0.07	5	<5	<5	<20		16	<10	0.06	11	<20			
28.1	279	Salt Chuck	463	*	6	0.16	0.3	28	5.22	<2	0.160	0.18	6	0.02	50	0.07	1	<5	<5	<20		29	<10	0.04	9	<20			
28.1	280	Salt Chuck	563	*	12	0.14	0.4	15	6.40	<2	0.142	0.14	3	<0.01	9	0.08	3	<5	<5	<20		27	<10	0.10	11	<20			
28.1	513	Salt Chuck	42		<5	0.43	<0.2	59	5.06	<2	0.257	0.08	12	0.14	129	0.12	1	<5	<5	<20		59	<10	0.06	13	<20			
28.2	114	Salt Chuck	340	*	<5	0.03	0.3	37	1.77	<2	0.028	0.06	<1	<0.01	44	<0.01	<1	<5	<5	<20		2	<10	<0.01	1	<20			
28.2	115	Salt Chuck	120	*	<5	1.97	20.0	95	3.69	<2	0.335	0.04	<1	<0.01	534	<0.01	<1	<5	<5	<20		46	<10	<0.01	<1	<20			
28.2	273	Salt Chuck	37	*	<5	0.02	12.0	269	1.22	<2	0.215	0.04	<1	<0.01	35	<0.01	<1	<5	<5	<20		1	<10	<0.01	2	<20			
28.2	9647	Salt Chuck	256	*	<5	2.33	86.5	91	2.56	<2	2.313	0.15	1	0.43	1046	0.03	<1	<5	<5	<20		138	12	0.06	34	25			
29.1	60	Portage Creek	230	*	<5	3.95	<0.2	61	7.11	<2	<0.01	0.33	4	2.13	922	0.42	4	<5	10	<20		287	<10	0.19	235	<20		<5	3
29.1	61	Portage Creek	281	*	<5	4.07	<0.2	34	8.75	<2	0.018	0.57	5	2.38	1116	0.55	4	<5	16	<20		248	<10	0.13	332	<20		<5	3
29.1	62	Portage Creek	200	*	<5	3.75	<0.2	28	>10	<2	0.015	0.40	5	1.93	1206	0.47	4	<5	12	<20		276	<10	0.12	352	<20		32	38
29.1	136	Portage Creek	463	*	<5	3.67	<0.2	43	4.32	<2	<0.01	0.45	8	1.87	1284	0.50	13	<5	8	<20		583	<10	0.24	208	<20		<5	59
29.1	137	Portage Creek	1111	*	<5	1.83	<0.2	7	13.74	<2	<0.01	0.23	27	0.70	468	0.05	6	<5	31	<20		565	<10	0.13	160	<20		<5	<1
29.1	138	Portage Creek	790	*	<5	2.79	<0.2	39	17.65	<2	0.016	2.15	8	3.37	2083	0.43	20	<5	11	<20		95	<10	0.31	367	<20		5	24
29.1	139	Portage Creek	1091	*	<5	1.68	<0.2	30	19.92	<2	<0.01	3.01	6	3.57	1956	0.19	18	<5	8	<20		75	<10	0.24	380	<20		6	15
29.1	140	Portage Creek	796	*	<5	3.59	<0.2	36	16.37	<2	0.014	2.58	10	3.69	2396	0.52	24	<5	14	<20		200	<10	0.21	466	<20		<5	12
29.1	141	Portage Creek	1067	*	<5	1.71	<0.2	45	23.21	<2	0.011	3.23	5	4.30	2174	0.17	22	<5	8	20		64	<10	0.62	443	<20		10	29
29.1	232	Portage Creek	262	*	<5	2.17	<0.2	37	4.34	<2	0.034	0.30	6	1.45	1042	0.24	3	<5	6	<20		190	<10	0.18	163	<20		<5	8
29.1	233	Portage Creek	401	*	<5	2.16	<0.2	34	3.92	<2	0.012	0.23	7	1.56	1039	0.19	3	<5	6	<20		285	<10	0.16	144	<20		<5	7
29.1	2367	Portage Creek	644	*	<5	3.11	<0.2	51	17.39	<2	<0.01	1.56	9	2.82	1976	0.42	14	<5	11	<20		138	<10	0.27	354	<20		7	13
29.1	2368	Portage Creek	833	*	<5	2.27	<0.2	55	18.98	<2	0.025	2.35	6	3.65	1967	0.28	17	<5	9	<20		87	<10	0.37	369	<20		<5	25
29.1	2369	Portage Creek	314	*	<5	4.07	<0.2	47	21.07	<2	<0.01	0.94	11	2.15	2095	0.49	11	<5	11	<20		152	<10	0.30	291	<20		<5	8
29.1	9598	Portage Creek	277	*	<5	3.05	<0.2	43	4.86	<2	<0.01	0.35	5	1.89	916	0.36	10	<5	9	<20		319	<10	0.18	191	<20		<5	<1
29.1	9599	Portage Creek	226	*	<5	2.70	<0.2	51	5.05	<2	<0.01	0.25	4	1.89	757	0.28	9	<5	6	<20		279	<10	0.13	177	<20		<5	2
29.1	9600	Portage Creek	96	*	<5	2.82	<0.2	25	16.97	<2	<0.01	0.30	1	2.06	637	0.40	23	<5	18	<20		144	<10	0.22	499	<20		39	21
30.1	915	Upper Taylor Creek	2742	*	<5	0.18	0.60	60.0	9.38	8	0.56	0.150	8	1.16	6956	<0.01	13	5	13	<20		18	<10	0.10	151	<20			
30.1	916	Upper Taylor Creek	967	*	<5	0.17	<0.2	39.0	1.40	3	0.18	0.090	6	0.48	230	<0.01	9	<5	<5	<20		14	<10	0.19	67	<20			
30.1	917	Upper Taylor Creek	607	*	<5	0.14	<0.2	41.0	3.63	5	0.13	0.050	4	0.76	274	0.01	12	<5	<5	<20		15	<10	0.19	108	<20			
30.1	918	Upper Taylor Creek	1741	*	<5	0.41	0.90	39.0	6.32	<2	0.18	0.100	6	1.02	2965	0.02	8	<5	5	<20		26	<10	0.15	94	<20			
30.1	6337	Upper Taylor Creek	2603	*	<5	0.45	1.90	54.0	9.02	4	0.44	0.120	7	1.26	5810	0.01	11	7	10	<20		24	<10	0.15	134	<20			
30.2	912	Upper Taylor Creek	2232	*	<5	0.25	1.20	74.0	>10	10	2.29	0.160	9	1.95	8007	<0.01	20	6	20	<20		23	<10	0.21	228	<20			
30.2	913	Upper Taylor Creek	2859	*	<5	0.21	0.20	43.0	5.94	6	0.26	0.110	5	0.92	1211	0.01	11	<5	6	<20		17	<10	0.10	111	<20			
30.2	914	Upper Taylor Creek	741	*	<5	0.20	0.20	40.0	4.10	<2	0.24	0.060	7	0.78	659	0.01	7	<5	<5	<20		17	<10	0.15	69	<20			
30.2	6333	Upper Taylor Creek	2603	*	<5	1.21	15.6	77	>10	<2	1.500	0.13	3	1.48	1169	<0.01	6	20	7	<20		18	<10	0.02	101	<20			
30.2	6334	Upper Taylor Creek	2069	*	<5	0.05	3	105	>10	<2	1.56	0.1	<1	0.38	497	<0.01	<1	62	<5	<20		<1	<10	<0.01	47	<20			
30.2	6335	Upper Taylor Creek	2718	*	<5	0.04	2.4	110	>10	<2	1.107	0.15	<1	0.53	883	0.01	3	86	7	<20		<1	<10	<0.01	78	<20			
30.2	6336	Upper Taylor Creek	1511	*	<5	0.13	2.7	124	>10	<2	1.044	0.12	1	0.99	1386	0.02	5	44	8	<20		1	<10	<0.01	100	<20			
31.1	51	Taylor Creek	190	*	<5	6.50	11.6	5	>10	<2	2.298	<0.01	4	3.31	5571	<0.01	<1	87	<5	<20		21	<10	<0.01	6	<20			
31.1	52	Taylor Creek	>20000	*	<5	3.48	121.7	48	>10	<2	25.020	<0.01	<1	2.16	2149	<0.01	<1	223	<5	<20		20	<10	<0.01	5	<20			
31.1	53	Taylor Creek	5505	*	<5	6.01	180.3	36	9.84	<2	49.117	<0.01	2	3.05	5572	<0.01	<1	229	<5	<20		30	<10	<0.01	7	<20			
31.1	54	Taylor Creek	4028	*	<5	7.29	29.5	44	7.70	<2	24.300	<0.01	2	3.35	7244	<0.01	<1	182	<5	<20		24	<10	<0.01	3	<20			
31.1	225	Taylor Creek	894	*	<5	>10	38.9	8	7.86	<2	4.382	<0.01	4	6.64	5369	<0.01	5	33	<5	<20		46	<10	<0.01	12	<20			
31.1	226	Taylor Creek	865	*	<5	0.09	6.7	5	>10	<2	>50	<0.01	3	0.01	1081	<0.01	<1	435	<5	<20		3	<10	<0.01	11	<20			
31.1	227	Taylor Creek	670	*	<5	>10	13.0	2	2.59	<2	10.221	<0.01	5	7.72	6700	<0.01	7	8	<5	<20		39	<10	<0.01	7	<20			
32.1	548	Kane Peak	437	*	<5	1.29	<0.2	34	3.12	2	0.014	0.31	4	0.96	298	0.13	6	<5	7	<20		68	<10	0.13	100	<20		<5	5
32.2	547	Kane Peak	283	*	<5	0.81	<0.2	121	5.68	3	0.015	0.18	6	1.37	242	0.06	17	<5	<5	<20		43	<10	0.10	248	<20		12	16
32.3	550	Kane Peak	<10	*	<5	0.18	<0.2	86	>10	<2	0.020	<0.01	<1	0.61	74	<0.01	<1	<5	<5	<20		3	<10	0.02	18	<20		45	56

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
32.3	551	Kane Peak	R	G	1	OC	Gossan w/ pyroxene	17		0.7		1217		4		27		8	441	33	0.18	<5
32.3	552	Kane Peak	R	G	0.4	RC	Pyroxenite w/ 30% olivine & <0.1% mal	41		1.2		2019		4		16		<1	192	29	0.04	<5
32.3	2865	Kane Peak	R	G		OC	Fest mafic intrusive	<5		<0.1		1954		3		16		<1	158	39	0.08	<5
32.3	2866	Kane Peak	R	G		OC	Slight mal stain & extensive fest	9		0.9		2078		6		23		<1	295	41	0.04	<5
32.3	2867	Kane Peak	R	S		OC	Mal stained mafic intrusive	6		0.7		2091		6		16		<1	310	35	0.05	<5
32.4	553	Kane Peak	SS					<5		<0.1		109		<2		24		<1	141	32	0.12	<5
32.5	546	Kane Peak	SS					<5		<0.1		63		4		31		<1	211	41	0.13	<5
32.6	392	Kane Peak	R	Rep	3	OC	Hornblendite w/ mag, py	<5		<0.1		144		5		95		2	42	39	2.98	<5
32.6	393	Kane Peak	SS					17		<0.1		14		2		41		<1	214	33	0.46	<5
32.6	394	Kane Peak	SS					19		<0.1		43		12		91		<1	316	80	1.04	5
32.6	395	Kane Peak	SS					17		<0.1		31		2		43		<1	275	43	0.31	<5
32.6	396	Kane Peak	SS					15		<0.1		80		10		88		<1	259	47	0.79	<5
32.6	397	Kane Peak	SS					15		<0.1		10		2		42		<1	24	7	0.61	7
32.6	398	Kane Peak	SS					14		<0.1		24		8		66		<1	15	6	1.11	<5
32.6	545	Kane Peak	SS					<5		0.3		207		6		44		<1	131	32	0.51	<5
32.6	2810	Kane Peak	R	G		RC	Hornblendite	6		<0.1		107		7		87		2	6	32	2.31	<5
32.6	2811	Kane Peak	R	G	2	OC	Hornblendite w/ po	8		<0.1		410		6		79		2	47	59	2.18	<5
32.6	2812	Kane Peak	R	C	2	OC	Hornblendite w/ po	6		<0.1		300		7		95		2	35	41	2.45	<5
32.6	2813	Kane Peak	R	RC	2	OC	Hornblendite w/ po	2		<0.1		325		3		12		<1	111	67	0.15	<5
32.6	2814	Kane Peak	R	C		OC	Fest hornblendite w/ po	3		<0.1		271		5		30		<1	177	68	0.22	6
32.7	549	Kane Peak	SS					<5		<0.1		29		3		64		<1	20	12	1.52	<5
33.1	50	Indian Point	R	Rep	0.15	OC	Sulf-bearing sil band in qz-ser sc	187		0.2		47		115		129		7	38	13	0.21	47
33.1	224	Indian Point	R	Rep	0.13	OC	Py from sil sulf band in ser sc	87		0.4		44		131		110		5	54	23	0.15	39
34.1	47	West Duncan	R	Rep	0.5	OC	Black slate w/ py & sl	24		24.2		58		2547		3.00	*	8	11	<1	0.10	653
34.1	48	West Duncan	R	Rep	0.15	OC	Sulf band in slate	24		25.3		52		4651		2.80	*	10	13	<1	0.14	878
34.1	222	West Duncan	R	Rep	0.2	OC	Sil black slate w/ sulf	6		9.3		33		893		3382		12	20	<1	0.09	427
34.1	223	West Duncan	R	Rep	1.5	OC	Sil black slate w/ sulf	8		19.7		46		1633		1.17	*	9	11	<1	0.09	441
34.1	2622	West Duncan	R	G	0.3	OC	Py band in slate	20		30.8		51		5400		2.97	*	5	8	3	0.03	782
34.1	9645	West Duncan	R	Rep	0.5	OC	Sil zone w/ dissem py, sl, gn in gray sc	<5		5.8		23		1849		5.40	*	4	9	1	0.12	491
35.1	278	Kupreanof Pyrite	R	C	6	OC	Msv py band in sil sc	22		31.8		36		1304		4765		7	12	2	0.19	1268
35.1	9646	Kupreanof Pyrite	R	C	6	OC	Msv py in sil black phy	7		24.1		37		1210		1.67	*	21	18	3	0.23	944
36.1	42	Castle Island Mine	R	G		MD	Barite w/ very fg sulf	59		15.9		518		1584		5630		7	10	<1	<0.01	198
36.1	43	Castle Island Mine	R	G		MD	Barite w/ banded py	76		42.8		247		5547		1.40	*	4	8	<1	<0.01	306
36.1	46	Castle Island Mine	R	G	0.4	MD	Banded barite w/ py	347		151.0		298		7783		2.30	*	3	2	<1	<0.01	64
36.1	218	Castle Island Mine	R	G		MD	Barite w/ sulf	58		28.8		413		4971		1.66	*	3	3	1	0.01	58
36.1	2621	Castle Island Mine	R	G		MD	Barite w/ bands of py & gn	85		31.2		400		3580		9800		3		2	<0.01	134
36.2	44	Castle Island Mine	R	C	0.75	OC	Qz & dike	8		0.2		6		121		534		1	10	5	0.18	10
36.2	45	Castle Island Mine	R	G		OC	Fest sil gs sc	9		0.3		187		11		116		1	49	29	1.24	33
36.2	219	Castle Island Mine	R	C	1	OC	Qz vn	<5		<0.1		12		31		109		<1	6	2	0.14	<5
36.2	220	Castle Island Mine	R	G		OC	Fest sil green-gray sc w/ py	<5		<0.1		65		21		89		<1	19	13	0.40	9
36.2	221	Castle Island Mine	R	G		OC	Fest sil gs	<5		<0.1		81		6		173		<1	44	26	1.01	<5
37.1	808	Rubble	R	Rep		OC	Qz vn	<5		<0.1		2		<2		13		<1	14	4	0.50	18
37.1	3920	Rubble	R	G	0.5	OC	Black slate w/ fg sulf	14		<0.1		50		8		250		36	48	5	0.37	27
37.1	3921	Rubble	R	Rep	30	OC	Sil qz-ser sc	<5		0.2		24		14		132		29	59	10	0.16	10
37.1	3938	Rubble	R	C	1.7	OC	Bedded & dissem py in qz-chl-ser sc	9		1.4		24		72		805		21	18	5	0.47	33
37.1	3939	Rubble	R	S		RC	Gs & qz lenses w/ po, py, cp	<5		0.5		434.0		6		86		6	58	36	1	<5
37.1	8801	Rubble	R	S		RC	Chl sc	<5		0.4		39		14		259		26	61	9	0.34	31
37.2	3940	Rubble	R	SC	8@1	OC	Chl-cc sc w/ banded, dissem, & nodular py	<5		<0.1		34		5		48		8	34	32	0.53	11
37.2	3941	Rubble	R	Rep	11	OC	Gs, chl sc, ls, black slate, 2-3% py	<5		<0.1		33		4		112		6	44	14	1.65	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
32.3	551	Kane Peak	<10	*	<5	0.16	<0.2	312	6.33	<2	<0.01	0.01	<1	0.53	142	0.03	2	<5	<5	<20		3	<10	0.02	59	<20		<5	1
32.3	552	Kane Peak	<10	*	<5	0.20	<0.2	91	2.20	<2	0.010	<0.01	<1	3.45	233	<0.01	<1	<5	<5	<20		2	<10	<0.01	5	<20		52	53
32.3	2865	Kane Peak	<10	*	<5	0.21	<0.2	56	4.99	<2	0.018	<0.01	<1	2.80	216	<0.01	<1	<5	<5	<4	*	3	<10	<0.01	8	<4	*	113	180
32.3	2866	Kane Peak	<10	*	<5	0.16	<0.2	67	3.37	<2	<0.01	<0.01	<1	5.27	383	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	6	<4	*	78	83
32.3	2867	Kane Peak	<10	*	<5	0.17	<0.2	60	2.86	<2	0.010	<0.01	<1	3.72	291	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	6	<4	*	46	51
32.4	553	Kane Peak	16	*	<5	0.09	<0.2	96	2.71	<2	<0.01	0.01	<1	4.22	358	<0.01	<1	<5	<5	<20		2	<10	<0.01	10	<20		15	13
32.5	546	Kane Peak	73	*	<5	0.12	<0.2	95	3.92	<2	0.011	0.01	<1	5.36	440	<0.01	3	<5	<5	<20		6	<10	0.02	63	<20		124	16
32.6	392	Kane Peak	458	*	<5	3.34	0.3	132	8.75	<2	0.028	1.18	<1	2.71	797	0.48	31	<5	20	<20		213	<10	0.16	297	<20			
32.6	393	Kane Peak	222	*	<5	0.20	<0.2	102	3.25	<2	<0.01	0.04	4	3.97	696	<0.01	<1	<5	<5	<20		26	<10	0.04	46	<20		24	17
32.6	394	Kane Peak	436	*	<5	0.31	<0.2	137	5.45	<2	0.036	0.12	3	4.82	2162	0.03	1	<5	<5	<20		62	<10	0.06	50	<20		34	18
32.6	395	Kane Peak	161	*	<5	0.11	<0.2	77	3.99	<2	<0.01	0.07	2	6.63	538	<0.01	1	<5	<5	<20		5	<10	0.03	55	<20		22	17
32.6	396	Kane Peak	349	*	<5	0.15	<0.2	95	4.22	<2	0.023	0.23	3	6.04	568	0.06	<1	<5	<5	<20		9	<10	0.07	60	<20		11	13
32.6	397	Kane Peak	519	*	<5	0.53	<0.2	24	2.69	<2	<0.01	0.07	8	0.74	284	0.07	<1	<5	<5	<20		30	<10	0.07	58	<20		16	13
32.6	398	Kane Peak	582	*	<5	0.58	<0.2	22	2.18	2	0.033	0.17	4	0.78	319	0.13	<1	<5	<5	<20		42	<10	0.09	40	<20		15	16
32.6	545	Kane Peak	363	*	<5	0.39	<0.2	78	2.90	<2	0.017	0.12	1	3.55	365	0.03	2	<5	<5	<20		19	<10	0.04	37	<20		18	12
32.6	2810	Kane Peak	266	*	<5	4.23	0.3	13	8.73	6	0.020	0.76	<1	2.18	648	0.41	36	<5	16	<20		276	<10	0.05	340	<20		<5	<1
32.6	2811	Kane Peak	325	*	<5	2.78	0.3	70	8.45	<2	0.056	0.72	<1	1.90	635	0.37	22	<5	13	<20		181	<10	0.18	215	<20		<5	5
32.6	2812	Kane Peak	390	*	<5	3.21	0.2	56	7.43	<2	0.044	0.87	<1	2.21	723	0.37	23	<5	14	<20		194	<10	0.11	225	<20		<5	4
32.6	2813	Kane Peak	10	*	<5	0.49	<0.2	218	2.31	<2	0.018	0.03	<1	2.02	154	0.02	1	<5	<5	<20		12	<10	0.01	14	<20		<5	2
32.6	2814	Kane Peak	14	*	<5	0.73	<0.2	390	4.40	<2	0.028	0.02	<1	6.74	486	0.02	2	<5	6	<20		19	<10	0.01	25	<20		11	12
32.7	549	Kane Peak	732	*	<5	0.71	<0.2	41	3.24	3	0.022	0.60	6	1.07	248	0.08	6	<5	<5	<20		35	<10	0.14	95	<20			
33.1	50	Indian Point	207	*	<5	0.40	0.5	117	>10	<2	0.150	0.03	2	0.14	575	0.02	<1	10	<5	<20		21	<10	<0.01	3	<20			
33.1	224	Indian Point	246	*	<5	1.49	<0.2	69	8.80	<2	0.167	0.02	3	0.29	1672	0.02	<1	8	<5	<20		58	<10	<0.01	3	<20			
34.1	47	West Duncan	887	*	<5	1.51	95.5	39	>10	<2	36.380	0.06	<1	0.56	303	<0.01	<1	42	<5	<20		19	<10	<0.01	4	<20			
34.1	48	West Duncan	1062	*	<5	2.19	124.0	62	>10	<2	37.780	0.09	<1	1.15	566	<0.01	<1	49	<5	<20		28	<10	<0.01	7	<20			
34.1	222	West Duncan	665	*	<5	5.59	17.3	39	>10	<2	5.551	0.06	2	2.89	1268	<0.01	<1	28	<5	<20		96	<10	<0.01	19	<20			
34.1	223	West Duncan	265	*	<5	2.37	44.2	34	>10	<2	18.437	0.05	<1	1.47	706	<0.01	<1	32	<5	<20		34	<10	<0.01	9	<20			
34.1	2622	West Duncan	10		<2	1.76	>100.0	19	>15.00	<10	40.800	0.01	<10	0.48	330	<.01		40	1			29		<.01	1	<10			
34.1	9645	West Duncan	351	*	<5	5.23	61.5	19	17.08	3	>50	0.03	<1	2.57	964	<0.01	1	14	<5	<20		161	22	<0.01	<1	44			
35.1	278	Kupreanof Pyrite	4044	*	<5	0.10	13.4	68	24.04	6	11.265	0.08	<1	<0.01	32	0.01	<1	46	<5	<20		10	<10	<0.01	4	<20			
35.1	9646	Kupreanof Pyrite	2087	*	<5	0.25	97.4	81	12.29	4	19.947	0.08	<1	0.03	98	0.02	<1	39	<5	<20		12	11	<0.01	10	<20			
36.1	42	Castle Island Mine	>20000	*	<5	<0.01	59.9	16	7.24	<2	3.255	<0.01	<1	<0.01	50	<0.01	<1	54	<5	<20		25	<10	<0.01	3	<20			
36.1	43	Castle Island Mine	>20000	*	<5	0.16	95.0	9	5.36	<2	5.096	<0.01	<1	<0.01	73	<0.01	<1	113	<5	<20		38	<10	<0.01	3	<20			
36.1	46	Castle Island Mine	>20000	*	<5	<0.01	185.2	2	0.94	2	13.331	<0.01	<1	<0.01	49	<0.01	<1	92	<5	<20		67	<10	<0.01	1	<20			
36.1	218	Castle Island Mine	>20000	*	<5	0.01	130.4	4	0.84	<2	5.408	<0.01	<1	<0.01	34	<0.01	<1	60	<5	<20		104	<10	<0.01	4	<20			
36.1	2621	Castle Island Mine	10		<2	0.25	73.0	9	2.99	<10	4400	<0.01	<10	<0.01	35	<0.01		54	<1			46		<0.01	3	30			
36.2	44	Castle Island Mine	>20000	*	<5	9.06	2.0	90	2.19	<2	0.355	0.10	3	2.60	6484	0.02	3	<5	8	<20		414	<10	<0.01	15	<20			
36.2	45	Castle Island Mine	1674	*	<5	7.59	0.3	60	6.34	<2	0.134	0.44	5	1.41	1427	0.04	2	<5	11	<20		149	<10	<0.01	89	<20			
36.2	219	Castle Island Mine	11530	*	<5	4.23	0.4	106	1.03	<2	0.080	0.08	1	1.05	3118	<0.01	1	<5	<5	<20		191	<10	<0.01	10	<20			
36.2	220	Castle Island Mine	4721	*	<5	>10	<0.2	24	4.04	<2	0.072	0.16	4	0.86	3537	0.01	1	<5	8	<20		324	<10	<0.01	39	<20			
36.2	221	Castle Island Mine	875	*	<5	5.32	0.4	62	7.97	<2	0.175	0.26	5	1.38	1661	0.05	<1	<5	19	<20		110	<10	<0.01	159	<20			
37.1	808	Rubble	44	*	<5	1.14	<0.2	131	0.99	<2	<0.01	<0.01	<1	0.51	186	<0.01	<1	<5	<5	<4	*	10	<10	<0.01	16	9	*		
37.1	3920	Rubble	944	*	<5	4.16	2.8	69	5.29	3	0.084	0.09	14	0.38	304	0.16	6	<5	<5	<20		77	<10	<0.01	77	<20			
37.1	3921	Rubble	793	*	<5	1.48	1.3	125	3.04	<2	0.048	0.04	3	0.18	189	0.06	2	<5	<5	<20		61	<10	<0.01	33	<20			
37.1	3938	Rubble	2904	*	<5	0.14	3.6	46	>10	6	0.160	0.22	5	0.21	77	0.02	9	<5	<5	<20		5	<10	<0.01	4	<20			
37.1	3939	Rubble	194	*	<5	1.13	0	176	5.23	2	0.03	0.0	5	0.77	329	0.050	4	<5	5	<20		44	<10	0	63	<20			
37.1	8801	Rubble	2320	*	<5	0.60	2.8	96	3.25	2	0.114	0.18	3	0.25	80	0.06	4	<5	<5	<20		20	<10	<0.01	49	<20			
37.2	3940	Rubble	4636	*	<5	4.54	0.4	26	7.81	4	0.046	0.29	15	0.15	335	0.04	<1	<5	<5	<20		68	<10	<0.01	18	<20			
37.2	3941	Rubble	1632	*	<5	8.14	0.4	71	4.58	7	0.011	0.09	10	1.18	785	0.04	3	<5	6	<20		200	<10	<0.01	56	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
37.2	3942	Rubble	R	S		OC	Ls lens in gs w/ py & gray sulf	<5		<0.1		30		3		62		7	41	9	0.94	<5
37.2	3943	Rubble	R	G		OC	Msv py lens in calc-gs	20		0.6		41		17		23		17	19	3	0.08	10
37.2	3944	Rubble	R	C	4.5	OC	Qz-ser sc w/ bedded py	11		0.4		30		14		88		14	19	12	0.43	23
37.2	3945	Rubble	R	S		OC	Layers of msv py in qz-ser sc & calc sc	43		1.7		81		32		52		74	20	12	0.20	45
37.2	3946	Rubble	R	G		FL	Fg py in qz	10		0.2		18		13		135		29	24	4	0.14	15
37.2	3948	Rubble	R	S		OC	Py layers in gs	6		0.5		115		17		121		7	30	51	0.95	12
37.2	3949	Rubble	R	S		RC	Sil gs w/ py lenses	10		1.4		153		47		64		43	92	10	0.21	60
37.2	3950	Rubble	R	S		RC	Sil gs w/ py	12		0.9		34		19		85		70	37	1	0.06	17
37.2	8808	Rubble	R	Rep		OC	Calc chl sc w/ py lenses	8		0.4		50		16		279		68	9	4	0.07	33
37.2	8809	Rubble	R	C	2	OC	Calc chl sc w/ py lenses	<5		0.4		58		6		124		47	9	3	0.07	48
37.2	8810	Rubble	R	Rep		OC	Semi-massive py in chl sc	<5		0.5		43		10		95		29	12	3	0.10	59
37.2	8811	Rubble	R	SC	6@.5	OC	Py layers in sil chl sc	7		0.8		42		21		44		17	60	28	0.99	25
37.2	8812	Rubble	R	Rep		OC	Py lenses in sil chl sc	33		1.5		59		24		108		35	30	15	0.38	43
37.2	8813	Rubble	R	C	1.5	OC	Py lens in sil chl sc	7		0.7		38		17		136		15	55	11	0.73	37
37.3	923	Rubble	R	S	0.25	OC	Gs w/ qz vn & py layers	96		0.8		49		38		21		17	111	53	1.07	35
37.3	3947	Rubble	R	S		OC	Black slate w/ py	15		0.7		41.0		15		82		30	31	5	0	31
37.3	6339	Rubble	R	Rep	1.0	OC	Silvery calc sc w/ py layers	95		0.7		175		81		78		1	191	160	1.49	14
37.3	6340	Rubble	R	S		OC	Calc lenses w/ crystalline py in chl sc	21		<0.1		35		14		60		12	59	52	2.15	5
37.3	6341	Rubble	R	Rep	1.0	OC	Calc chl sc w/ ~10% dissem py	25		0.4		320		32		33		24	526	132	1.08	92
37.4	708	Rubble	R	RC	10	OC	white/gray meta volc seds w/ 7% py	49		0.4		81		6		116		4	118	45	2.69	20
37.4	709	Rubble	R	Rep	2	OC	Qz	6		0.3		101		<2		45		3	40	5	0.70	<5
37.4	710	Rubble	R	C	0.2	OC	Qz vn w/ py 30%	12		<0.1		17		11		32		3	44	78	2.17	85
37.4	813	Rubble	R	G		OC	Fest qz w/ py	<5		<0.1		22		<2		36		5	15	6	0.29	<5
37.4	3951	Rubble	R	S		OC	Py nodules in black slate	14		2.4		102.0		16		83		15	76	3	0	132
37.5	894	Rubble	R	G		OC	Sil phy w/ dissem py	<5		<0.1		13		127		21		1	10	2	0.2	<5
37.5	896	Rubble	R	S		FL	Br sil gp phy w/ py in seams & qz	21		0.5		97		88		19		1	13	3	0.38	11
37.5	6288	Rubble	R			FL	Sil phy w/ sl, gn, cp	16		7.9		434		4626		**3.9**	*	<1	7	7	0.19	<5
37.6	898	Rubble	R	G	0.5	OC	Fest sil phy	22		<0.1		101		59		3		<1	13	4	0.27	<5
37.7	900	Rubble	R	G		FL	Barite w/ iron carbonate seams	<5		<0.1		6		19		28		<1	10	5	0.47	<5
37.7	6298	Rubble	R	G		OC	Sil sc w/ py seams	12		<0.1		38		23		79		<1	10	4	0.53	<5
37.7	6299	Rubble	R	G		OC	Sil sc w/ py	<5		<0.1		31		15		31		2	7	2	0.19	<5
37.7	6300	Rubble	R	RC		OC	Qz-mariposite sc w/ ~5% py	6		0.6		91		10		153		<1	360	54	0.96	8
37.7	6301	Rubble	R	G		OC	Gp sc w/ py	8		1.2		20		20		33		23	14	2	0.32	25
37.7	6338	Rubble	R	G		RC	Gp ls w/ minor py in slate	<5		0.5		34		27		34		5	18	3	0.19	11
38.1	2862	East Duncan Pyrite	R	Rep	3.5	OC	Sil slate w/ layers, lenses, knots of py	9		2.0		88		7		36		36	204	48	0.43	91
38.1	3817	East Duncan Pyrite	R	SC	6@.5	OC	Slate w/ minor py	8		0.6		98		9		244		22	276	88	1.07	50
38.1	3818	East Duncan Pyrite	R	C	4.5	OC	Slate w/ interbedded py	<5		0.7		81		11		57		37	332	82	0.95	101
39.1	351	Spruce Creek	R	C	0.3	OC	Qz vn w/ py, gn, sl	213		7.0		223		1690		4163		6	21	11	0.44	49
39.1	9683	Spruce Creek	R	S		TP	Qz br w/ minor py hosted in sc	<5		0.2		47		17		73		3	17	12	1.00	<5
39.2	407	Spruce Creek	R	C	1.4	OC	Ls w/ fg sulf	416		14.9		98		820		5221		5	5	8	0.39	27
39.2	408	Spruce Creek	R	SC	5@.5	OC	Br gs to gs sc w/ carb inclusions, sulf	<5		0.4		128		11		233		2	5	17	2.03	<5
39.2	409	Spruce Creek	R	G		OC	Sheared fest gs w/ sulf	7		0.2		91		13		65		3	4	12	1.13	<5
39.2	410	Spruce Creek	R	G		RC	Sheared, sil gs w/ blebs of sulf	<5		<0.1		37		13		54		<1	3	11	1.18	<5
39.2	411	Spruce Creek	R	Rep	4	OC	Sheared gs w/ sulf	98		0.6		91		32		207		3	5	16	1.47	8
39.2	412	Spruce Creek	R	G		RC	Sheared, sil gs w/ sulf	7		<0.1		44		9		60		3	3	13	1.32	<5
39.2	2823	Spruce Creek	R	SC	5@.5	OC	Gs, ls, & sc w/ py	12		<0.1		208		9		87		4	11	23	1.62	<5
39.2	2824	Spruce Creek	R	SC	5@.5	OC	Gs & ls	13		0.3		105		6		76		2	4	13	1.31	<5
39.2	2825	Spruce Creek	R	SC	5@.5	OC	Gs & ls	<5		<0.1		92		6		53		3	4	15	1.71	<5
39.2	2826	Spruce Creek	R	SC	5@.5	OC	Gs & ls	<5		<0.1		78		5		75		2	5	20	2.09	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
37.2	3942	Rubble	1060	*	<5	>10	0.3	66	2.69	4	<0.01	0.04	6	0.84	1156	0.03	4	<5	<5	<20		511	<10	<0.01	61	<20			
37.2	3943	Rubble	29	*	<5	0.30	1.0	79	>10	10	0.073	0.43	<1	0.10	80	0.22	<1	<5	<5	<20		27	14	<0.01	6	<20			
37.2	3944	Rubble	8978	*	<5	1.55	0.5	38	6.20	4	0.247	0.33	5	0.10	177	0.04	4	<5	<5	<20		39	<10	<0.01	8	<20			
37.2	3945	Rubble	4607	*	<5	1.78	0.8	35	>10	8	0.641	0.13	1	0.06	368	<0.01	<1	10	<5	<20		52	<10	<0.01	9	<20			
37.2	3946	Rubble	650	*	<5	0.31	0.9	121	3.11	<2	0.070	0.06	13	0.06	69	0.11	2	<5	<5	<20		18	<10	<0.01	21	<20			
37.2	3948	Rubble	5099	*	<5	2.09	0.7	46	>10	10	0.026	0.20	7	0.71	338	0.06	<1	<5	<5	<20		50	<10	<0.01	37	<20			
37.2	3949	Rubble	3644	*	<5	0.33	1.1	138	9.94	4	0.116	0.12	1	0.04	32	0.03	7	12	<5	<20		11	<10	0.01	100	<20			
37.2	3950	Rubble	1776	*	<5	0.14	1.0	51	5.60	<2	0.091	0.04	1	<0.01	20	0.01	3	<5	<5	<20		5	<10	<0.01	45	<20			
37.2	8808	Rubble	794	*	<5	3.18	1.6	20	>10	8	0.237	0.04	2	0.16	822	<0.01	<1	<5	<5	<20		87	10	<0.01	6	<20			
37.2	8809	Rubble	455	*	<5	1.95	1.3	68	>10	11	0.192	0.05	1	0.07	549	0.01	<1	7	<5	<20		73	16	<0.01	7	<20			
37.2	8810	Rubble	401	*	<5	0.26	1.3	91	>10	12	0.142	0.07	<1	0.02	97	0.03	<1	5	<5	<20		20	16	<0.01	17	<20			
37.2	8811	Rubble	4779	*	<5	8.57	0.5	101	>10	8	0.023	0.18	7	0.78	922	0.06	<1	<5	<5	<20		184	<10	<0.01	30	<20			
37.2	8812	Rubble	3582	*	<5	3.97	1.0	66	>10	8	0.359	0.22	5	0.37	483	0.06	<1	7	<5	<20		90	<10	<0.01	22	<20			
37.2	8813	Rubble	10035	*	<5	1.47	1.2	97	6.39	4	0.061	0.17	5	0.79	284	<0.01	4	<5	<5	<20		32	<10	<0.01	19	<20			
37.3	923	Rubble	3251	*	<5	3.01	<0.2	122	>10	<2	0.05	0.26	1	0.57	471	<0.01	2	7	<5	<20		56	<10	0.141	34	<20			
37.3	3947	Rubble	1709	*	<5	0.03	1	132	3.45	2	0.16	0.3	3	0.05	26	0.050	2	<5	<5	<20		10	<10	<0.01	30	<20			
37.3	6339	Rubble	1669	*	<5	2.9	1	89	>10	<2	0.042	0.22	2	1.1	491	<0.01	<1	6	<5	<20		66	<10	0.069	38	<20			
37.3	6340	Rubble	<10	*	<5	1.19	0.2	47	>10	<2	0.018	0.24	6	1.6	397	0.03	4	<5	<5	<20		32	<10	<0.01	71	<20			
37.3	6341	Rubble	<10	*	<5	2.93	0.4	89	>10	<2	0.039	0.35	2	0.59	293	0.01	2	8	<5	<20		56	<10	0.161	27	<20			
37.4	708	Rubble	10378	*	<5	7.51	1.0	43	6.40	<2	0.013	0.16	2	3.45	898	0.04	1	<5	<5	<4	*	508	<10	0.08	39	9	*		
37.4	709	Rubble	616	*	<5	0.64	0.3	95	0.92	<2	<0.01	0.03	<1	0.74	148	0.01	1	<5	<5	<4	*	29	<10	<0.01	26	9	*		
37.4	710	Rubble	105	*	<5	0.10	0.8	40	>10	<2	0.011	0.14	<1	2.30	310	0.03	<1	<5	<5	<4	*	6	18	<0.01	85	8	*		
37.4	813	Rubble	360	*	<5	9.39	<0.2	94	2.35	<2	0.011	0.02	2	1.74	630	0.03	<1	<5	<5	<4	*	266	<10	<0.01	21	8	*		
37.4	3951	Rubble	576	*	<5	0.01	2	196	>10	7	0.16	0.1	<1	0.08	33	0.060	<1	69	<5	<20		9	<10	<0.01	16	<20			
37.5	894	Rubble	486	*	<5	2.47	<0.2	109	2.2	<2	0.04	0.08	3	0.98	994	<0.01	<1	<5	<5	<20		174	<10	<0.01	5	<20			
37.5	896	Rubble	460	*	<5	8.4	0.2	55	8.37	<2	0.167	0.11	4	2.03	2727	0.01	<1	<5	<5	<20		130	<10	<0.01	6	<20			
37.5	6288	Rubble	273	*	<5	3.86	223.2	136	0.93	<2	5.18	0.07	<1	0.05	878	0.02	<1	6	<5	<20		94	<10	<0.01	4	<20			
37.6	898	Rubble	892	*	<5	0.28	<0.2	149	0.84	<2	0.035	0.13	3	0.12	263	<0.01	<1	<5	<5	<20		12	<10	<0.01	6	<20			
37.7	900	Rubble	**17.88%**	*	<5	8.75	<0.2	57	3.58	<2	0.295	0.02	1	3.71	795	<0.01	3	<5	<5	<20		199	<10	<0.01	58	<20			
37.7	6298	Rubble	320	*	<5	4.06	0.4	67	1.11	<2	0.034	0.06	3	0.75	911	<0.01	<1	<5	<5	<20		97	<10	<0.01	6	<20			
37.7	6299	Rubble	916	*	<5	0.2	0.2	193	0.67	<2	0.033	0.06	<1	0.11	277	<0.01	<1	<5	<5	<20		3	<10	<0.01	8	<20			
37.7	6300	Rubble	3039	*	<5	6.02	0.4	355	6.51	<2	0.253	0.13	<1	5.42	1016	0.01	2	<5	8	<20		243	<10	<0.01	40	<20			
37.7	6301	Rubble	3291	*	<5	0.05	0.3	94	1.71	<2	1.036	0.06	2	0.03	26	<0.01	3	6	<5	<20		16	<10	<0.01	37	<20			
37.7	6338	Rubble	456	*	<5	>10	1.5	38	2.1	<2	0.093	0.04	7	1.55	2159	0.03	1	<5	<5	<20		548	<10	<0.01	14	<20			
38.1	2862	East Duncan Pyrite	4593	*	<5	0.02	0.2	122	>10	<2	0.149	0.22	1	0.12	76	0.01	<1	<5	<5	<20		<1	<10	<0.01	19	<20			
38.1	3817	East Duncan Pyrite	5010	*	<5	5.68	0.5	122	7.14	<2	0.056	0.18	2	1.10	413	0.02	<1	<5	<5	<20		125	<10	<0.01	28	<20			
38.1	3818	East Duncan Pyrite	5077	*	<5	2.66	<0.2	113	>10	<2	0.072	0.16	2	0.97	449	0.01	<1	<5	<5	<20		61	<10	<0.01	27	<20			
39.1	351	Spruce Creek	470	*	<5	8.24	19.7	84	4.96	<2	1.104	0.22	5	2.91	5737	0.02	1	<5	<5	<20		278	<10	<0.01	14	<20			
39.1	9683	Spruce Creek	255	*	<5	4.11	<0.2	95	2.46	<2	0.038	0.07	2	0.51	419	0.06	<1	<5	<5	<20		74	<10	0.14	33	<20			
39.2	407	Spruce Creek	579	*	<5	23.26	23.4	12	2.78	<2	7.802	0.14	<1	0.32	1497	0.03	<1	30	<5	<20		267	<10	<0.01	10	<20			
39.2	408	Spruce Creek	889	*	<5	3.10	0.4	24	4.55	<2	0.041	0.23	<1	1.45	1369	0.03	7	<5	<5	<20		201	<10	0.10	75	<20			
39.2	409	Spruce Creek	1588	*	<5	0.74	0.3	48	3.92	<2	0.061	0.52	3	0.58	378	0.04	5	<5	<5	<20		53	<10	0.16	49	<20			
39.2	410	Spruce Creek	767	*	<5	1.00	<0.2	27	2.62	<2	0.016	0.29	4	0.88	643	0.06	7	<5	<5	<20		108	<10	0.16	65	<20			
39.2	411	Spruce Creek	767	*	<5	8.30	0.4	19	4.07	<2	0.062	0.15	<1	1.25	1680	0.02	4	<5	<5	<20		431	<10	0.07	51	<20			
39.2	412	Spruce Creek	1022	*	<5	0.45	<0.2	37	4.73	<2	0.029	0.26	<1	1.25	678	0.03	6	<5	<5	<20		54	<10	0.15	58	<20			
39.2	2823	Spruce Creek	861	*	<5	2.11	0.2	25	5.01	<2	0.015	0.25	<1	1.51	1007	0.03	6	<5	<5	<20		162	<10	0.10	65	<20			
39.2	2824	Spruce Creek	1214	*	<5	0.71	<0.2	18	4.72	<2	0.022	0.39	3	1.13	667	0.03	6	<5	<5	<20		51	<10	0.15	58	<20			
39.2	2825	Spruce Creek	1022	*	<5	0.71	<0.2	20	4.84	<2	0.020	0.55	<1	1.38	586	0.03	7	<5	<5	<20		143	<10	0.23	73	<20			
39.2	2826	Spruce Creek	1107	*	<5	1.39	<0.2	13	4.59	<2	0.015	0.68	<1	1.63	1031	0.03	8	<5	<5	<20		173	<10	0.21	88	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
39.2	2827	Spruce Creek	R	SC	5@.5	OC	Gs & ls	<5		<0.1		122		6		56		4	5	21	1.43	<5
39.2	2828	Spruce Creek	R	SC	4@.5	OC	Gs	12		<0.1		106		5		48		2	12	20	1.92	<5
39.2	2829	Spruce Creek	R	SC	6@.5	OC	Gs	30		<0.1		151		7		83		10	7	18	2.58	<5
39.2	2830	Spruce Creek	R	S	0.8	OC	Fest gs	122		0.2		150		8		91		5	18	24	2.70	<5
39.3	421	Spruce Creek	R	G	0.4	OC	Marble w/ gn & sl	779		59.1		405		5.62	*	2.10	*	11	12	7	0.17	127
39.3	2835	Spruce Creek	R	G		OC	Volc w/ sulf	17		0.2		169		22		59		2	4	8	1.41	<5
40.1	465	Nicirque	R	Rep	3.5	OC	Slate w/ py bands	56		2.6		104		14		333		23	93	14	0.73	93
41.1	188	Southwest Duncan	R	S	20	RC	Gs w/ lenses & blebs of py	821		1.2		1189		25		93		20	71	53	0.92	1906
41.1	189	Southwest Duncan	R	G	0.3	RC	Gs w/ blebs of py, mal stain	50		0.5		1150		5		35		2	39	50	1.12	21
41.1	9634	Southwest Duncan	R	S		RC	Sil gs w/ py	208		1.4		954		149		99		8	57	57	0.85	103
41.1	9635	Southwest Duncan	R	G		FL	Vuggy qz-cc vn w/ py, cp, po in sil gs	15		1.0		1086		22		37		7	7	10	0.36	99
42.1	540	TB	R	G	1.0	OC	Red-yellow sil rhyolite w/ py blobs	26		0.3		52		24		69		26	49	21	0.16	81
42.2	541	TB	R	G	0.3	FL	Sil br zone w/ 15% py	<5		0.2		10		20		111		10	8	<1	0.21	884
42.2	2626	TB	R	G	0.3	RC	Sil, br rhyolite w/ py	<5		0.5		3		115		425		6	1	2	0.29	150
42.2	9725	TB	R	G	0.4	RC	Chalcedony, vuggy w/ 10% py	<5		0.4		8		50		361		2	4	<1	0.25	30
43.1	181	Monongehela	R	C	3	OC	Fest volc	<5		0.4		7		37		203		3	2	2	0.26	54
43.1	185	Monongehela	R	G	2	OC	Rhyolite	<5		<0.1		6		24		192		3	2	2	0.35	16
44.1	36	Helen S Mine	R	G		MD	Slightly sil gs w/ py	4248		1.6		570		86		258		2	17	31	2.98	1471
44.1	381	Helen S Mine	R	C	2.5	TP	Fest sc	11		2.0		936		896		600		2	15	42	3.72	16
44.2	9698	Helen S Mine	R	G		FL	Greenish-gray alt volc w/ dissem & msv py	<5		0.4		437		43		495		2	3	24	1.48	6
44.3	2359	Helen S Mine	R	G	0.5	RC	Qz vn w/ sulf	35		15.5		36		3175		1.90	*	2	6	3	0.03	51
44.4	37	Helen S Mine	R	SS			Stream in gs to gs sc			3.0		90		457		948		<1	22	47	2.47	28
44.5	38	Helen S Mine	R	G		MD	Fest qz w/ sulf bands	120		53.0		60		1.00	*	8.50	*	<1	6	2	0.05	72
44.6	9565	Helen S Mine	R	C	0.9	OC	Qz vn & sil br zone in fest slate	132		1.78	*	64		1.09	*	12.80	*	2	6	5	0.11	86
44.7	9566	Helen S Mine	R	C	2.6	OC	Qz vn & sil br zone in fest slate	48		15.8		53		1429		4942		<1	6	2	0.14	73
44.8	39	Helen S Mine	R	G		MD	Fest qz w/ sulf bands	150		48.6		52		6811		6.30	*	1	10	1	0.04	102
44.9	9700	Helen S Mine	R	G		MD	Qz vn w/ sulf	75		2.13	*	39		1.74	*	7758		2	8	1	0.05	68
44.10	213	Helen S Mine	R	G		MD	Qz	4536		2.6		50		283		491		2	13	<1	0.11	317
44.10	214	Helen S Mine	R	G		MD	Gs	41		1.9		254		341		2471		1	52	28	3.44	33
44.10	2624	Helen S Mine	R	RC		MD	Msv sulf, py, sl	80		67.0		86		7200		3.41	*	2	21	13	0.01	540
44.11	30	Helen S Mine	R	Rep	1.5	OC	Qz vn w/ inclusions of gs w/ py	0.328	*	22.7		209		795		1042		2	13	3	0.42	892
44.11	31	Helen S Mine	R	Rep	0.4	OC	Gs	41		1.7		191		47		314		2	54	24	4.73	81
44.12	32	Helen S Mine	R	S	0.4	MD	Sil volc w/ sulf	82		38.9		54		7539		5.40	*	3	19	7	0.02	347
44.12	215	Helen S Mine	R	S		MD	Sulf	76		77.0		99		8858		4.00	*	3	39	17	0.14	709
44.13	382	Helen S Mine	R	C	1.6	TP	Msv py w/ sl, gn	48		65.0		56		9560		2540		3	33	10	0.02	315
44.13	383	Helen S Mine	R	C	0.7	TP	Sil sc w/ sulf	45		29.0		92		3078		3.00	*	3	33	14	0.17	445
44.14	200	Helen S Mine	R	C	1.8	TP	Msv py, po, gn	64		69.7		42		7564		3055		3	28	11	0.13	446
44.15	9642	Helen S Mine	R	Rep		RC	Sil, fest metavolc w/ dissem py, gn, sl	152		113.5		81		2.50	*	5.30	*	<1	14	12	0.19	117
44.16	2873	Helen S Mine	R	G		FL	Fest qz vn	<5		<0.1		21		<2		12		<1	10	7	0.17	25
44.17	2623	Helen S Mine	R	Rep	0.8	OC	Qz vn	10		1.8		10		500		330		1	4	<1	0.01	8
44.18	216	Helen S Mine	R	Rep	8	TP	Qz vn	<5		1.4		239		295		513		1	5	2	0.27	<5
44.18	217	Helen S Mine	R	RC		TP	Slate & sc	58		3.3		573		629		945		2	9	34	3.07	9
44.19	34	Helen S Mine	R	C	1.2	OC	Qz vn	15		2.9		8		442		337		3	15	1	0.04	<5
44.19	35	Helen S Mine	R	C		TP	Fest sil gs	30		2.4		116		585		995		2	19	18	1.65	13
44.20	33	Helen S Mine	R	C	2.3	TP	Qz vn	14		1.1		12		506		2870		2	7	4	0.05	6
44.21	40	Helen S Mine		G		MT	Sample of mine tailings	248		16.5		135		1888		1.40	*	3	20	18	0.65	371
44.22	41	Helen S Mine		G		MT	Sample of mine tailings	771		12.3		111		927		9950		3	29	20	0.84	159
44.23	569	Helen S Mine	R	G	0.3	MD	Sc w/ 30% qz	91		<0.1		67		5		51		2	18	10	0.45	23
44.23	570	Helen S Mine	R	C	1.2	TP	Sc w/ 4% gray sulfides	11		<0.1		221		4		72		<1	31	26	0.72	48

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
39.2	2827	Spruce Creek	1886	*	<5	0.85	<0.2	13	3.47	<2	0.017	0.50	2	1.05	922	0.02	5	<5	<5	<20		88	<10	0.15	51	<20			
39.2	2828	Spruce Creek	657	*	<5	0.99	<0.2	44	5.02	<2	0.023	0.34	<1	1.67	709	0.03	9	<5	<5	<20		148	<10	0.21	90	<20			
39.2	2829	Spruce Creek	477	*	<5	0.86	<0.2	26	6.14	<2	0.019	0.11	<1	2.35	743	0.04	9	<5	<5	<20		53	<10	0.10	99	<20			
39.2	2830	Spruce Creek	498	*	<5	0.33	<0.2	72	7.22	6	0.015	0.13	<1	2.95	754	0.04	9	<5	5	<20		17	<10	0.03	98	<20			
39.3	421	Spruce Creek	7496	*	<5	14.46	158.6	24	2.72	<2	1.233	0.13	<1	0.34	7771	<0.01	<1	30	<5	<20		493	11	<0.01	6	<20			
39.3	2835	Spruce Creek	909	*	<5	0.67	0.2	17	4.39	<2	0.011	0.32	2	0.91	307	0.04	6	<5	<5	<20		158	<10	0.19	59	<20			
40.1	465	Nicirque	1902		<5	0.43	2.4	178	>10	<2	1.340	0.22	5	0.47	429	<0.01	<1	9	<5	8		6	<10	<0.01	149	<20			
41.1	188	Southwest Duncan	1336	*	<5	15.97	<0.2	140	18.36	7	0.123	0.18	<1	0.66	1197	0.02	2	56	<5	<20		309	10	0.03	106	<20			
41.1	189	Southwest Duncan	2081	*	<5	2.56	0.3	67	3.80	<2	0.036	0.07	<1	0.40	329	0.04	<1	<5	7	<20		247	<10	0.37	109	<20			
41.1	9634	Southwest Duncan	759	*	<5	8.19	0.9	264	18.79	7	0.111	0.13	8	0.45	1367	0.02	<1	6	<5	<20		164	11	0.02	199	<20			
41.1	9635	Southwest Duncan	24	*	56	14.08	0.4	312	4.14	2	0.015	0.01	16	0.19	790	0.01	1	<5	<5	<20		190	35	0.01	143	<20			
42.1	540	TB	82	*	<5	0.49	0.5	111	>10	<2	1.239	0.02	<1	0.05	176	<0.01	<1	17	<5	26	*	4	<10	<0.01	26	<20			
42.2	541	TB	172	*	<5	0.02	3.2	169	8.74	<2	2.190	0.11	15	<0.01	24	0.03	<1	<5	<5	10	*	<1	<10	<0.01	8	<20			
42.2	2626	TB	30		<2	0.01	1.0	60	5.03	<10	1.100	0.16	30	<.01	30	0.03		<2	<1			2		<.01	1	<10			
42.2	9725	TB	294	*	<5	0.02	2.7	211	1.30	<2	0.166	0.18	17	0.01	39	0.08	<1	<5	<5	2	*	1	<10	<0.01	2	<20			
43.1	181	Monongehela	317	*	<5	0.04	0.6	65	1.91	<2	0.016	0.15	30	0.02	102	0.16	4	11	<5	<20		4	<10	0.10	4	<20			
43.1	185	Monongehela	257	*	<5	0.07	0.5	76	2.08	<2	0.011	0.20	40	<0.01	180	0.19	3	<5	<5	<20		7	<10	0.08	4	<20			
44.1	36	Helen S Mine	685	*	<5	5.83	4.7	47	>10	5	0.216	0.12	6	2.08	1844	0.02	<1	<5	30	<20		115	<10	0.04	409	<20			
44.1	381	Helen S Mine	508	*	<5	1.94	3.6	15	>10	8	0.064	0.05	6	2.29	1309	0.02	3	<5	36	<20		45	<10	0.04	527	<20			
44.2	9698	Helen S Mine	540	*	<5	0.90	2.1	19	>10	<2	1.217	0.18	11	0.79	603	0.04	2	<5	8	<20		17	<10	0.27	20	<20			
44.3	2359	Helen S Mine	1011	*	<5	4.09	68.2	142	2.61	<2	4.789	0.01	1	0.02	1323	<0.01	<1	21	<5	<20		43	13	<0.01	1	<20			
44.4	37	Helen S Mine	782	*	<5	0.55	3.2	19	8.38	<2	0.382	0.05	6	1.02	6093	0.08	6	<5	10	<20		17	<10	0.09	219	<20			
44.5	38	Helen S Mine	957	*	<5	0.25	350.6	162	3.93	<2	20.420	<0.01	<1	0.02	236	<0.01	<1	35	<5	<20		4	<10	<0.01	5	<20			
44.6	9565	Helen S Mine	3		<5	3.68	534.2	74	5.45	<2	30.520	0.01	<1	0.06	823	<0.01	<1	46	<5	<20		22	35	<0.01	15	<20			
44.7	9566	Helen S Mine	43		<5	0.14	19.1	226	2.88	<2	3.650	0.06	2	<0.01	210	<0.01	<1	40	<5	<20		3	<10	<0.01	4	<20			
44.8	39	Helen S Mine	231	*	<5	0.07	273.4	169	5.97	<2	20.700	<0.01	<1	<0.01	129	<0.01	<1	45	<5	<20		2	<10	<0.01	3	<20			
44.9	9700	Helen S Mine	12		<5	0.19	22.2	145	5.54	<2	5.084	0.02	<1	<0.01	239	<0.01	<1	47	<5	<20		19	<10	<0.01	<1	<20			
44.10	213	Helen S Mine	77	*	<5	0.06	9.6	186	0.92	<2	0.323	0.01	<1	0.08	72	<0.01	<1	<5	<5	<20		1	<10	<0.01	7	<20			
44.10	214	Helen S Mine	1115	*	<5	1.48	11.1	62	8.57	4	1.081	0.10	5	2.39	1044	0.02	4	<5	24	<20		12	<10	<0.01	195	<20			
44.10	2624	Helen S Mine	10		<2	1.07	>100.0	31	>15.00	<10	9.000	<.01	<10	0.02	955	<.01		112	<1			11		<.01	1	<10			
44.11	30	Helen S Mine	214	*	<5	0.82	14.3	237	2.64	<2	0.796	0.06	<1	0.30	162	0.01	<1	<5	<5	<20		4	<10	<0.01	19	<20			
44.11	31	Helen S Mine	1185	*	<5	0.94	1.5	63	>10	4	0.130	0.13	4	3.60	1170	0.01	3	<5	26	<20		8	<10	0.01	229	<20			
44.12	32	Helen S Mine	65	*	<5	1.46	152.1	77	>10	<2	22.060	<0.01	<1	0.02	957	<0.01	<1	107	<5	<20		11	<10	<0.01	<1	<20			
44.12	215	Helen S Mine	657	*	<5	2.92	105.4	52	>10	<2	17.062	0.05	2	0.08	1774	<0.01	<1	159	<5	<20		17	<10	<0.01	12	<20			
44.13	382	Helen S Mine	193	*	<5	0.01	4.1	75	>10	<2	5.902	0.02	<1	<0.01	63	<0.01	<1	96	<5	<20		2	<10	<0.01	<1	<20			
44.13	383	Helen S Mine	620	*	<5	2.37	82.2	40	>10	<2	10.001	0.07	<1	0.07	1657	<0.01	<1	86	<5	<20		18	<10	<0.01	8	<20			
44.14	200	Helen S Mine	138	*	<5	0.02	7.2	55	30.86	8	8.488	<0.01	<1	<0.01	77	<0.01	<1	147	<5	<20		4	<10	<0.01	<1	<20			
44.15	9642	Helen S Mine	831	*	<5	1.64	222.5	44	15.47	5	19.996	0.02	<1	0.13	2274	<0.01	<1	81	<5	<20		37	22	<0.01	45	54			
44.16	2873	Helen S Mine	67	*	<5	0.05	<0.2	189	1.57	<2	0.170	0.03	1	0.06	286	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	13	<4	*		
44.17	2623	Helen S Mine	890		<2	0.10	0.5	300	2.27	<10	3.200	<.01	<10	<.01	415	<.01		<2	1			10		<.01	5	<10			
44.18	216	Helen S Mine	354	*	<5	0.32	1.9	170	1.31	<2	0.700	0.03	<1	0.12	316	0.01	<1	<5	<5	<20		6	<10	0.01	23	<20			
44.18	217	Helen S Mine	3339	*	<5	1.70	4.0	19	>10	<2	0.461	0.93	6	1.72	1684	0.01	1	<5	33	<20		29	<10	0.24	201	<20			
44.19	34	Helen S Mine	200	*	<5	0.02	0.4	283	1.31	<2	2.454	<0.01	<1	<0.01	107	<0.01	<1	<5	<5	<20		<1	<10	<0.01	12	<20			
44.19	35	Helen S Mine	18497	*	<5	0.57	3.9	66	6.77	<2	4.008	0.70	5	0.54	733	0.02	<1	<5	17	<20		9	<10	0.13	156	<20			
44.20	33	Helen S Mine	13	*	<5	0.32	13.4	229	1.16	<2	5.669	<0.01	<1	0.02	272	<0.01	<1	<5	<5	<20		6	<10	<0.01	5	<20			
44.21	40	Helen S Mine	2271	*	<5	8.03	56.2	13	7.26	<2	5.256	0.11	8	1.03	3560	0.17	1	24	7	<20		78	<10	0.03	63	<20			
44.22	41	Helen S Mine	1278	*	<5	4.10	41.0	26	7.80	<2	2.215	0.12	7	1.52	1798	0.26	1	14	9	<20		67	<10	0.04	74	<20			
44.23	569	Helen S Mine	280	*	<5	6.07	0.2	89	5.77	4	0.136	0.04	5	2.14	1094	<0.01	3	<5	9	<4	*	130	<10	<0.01	60	<4	*		
44.23	570	Helen S Mine	207	*	<5	4.74	0.3	86	7.64	5	0.259	0.02	7	1.91	1065	0.01	13	<5	31	<4	*	89	<10	<0.01	190	5	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
44.23	571	Helen S Mine	R	C	1.0	TP	Sc w/ 5% py & gray sulfides	12		0.7		460		6		192		2	3	23	0.81	8
44.24	281	Helen S Mine	R	C	0.1	OC	Fest qz vn w/ py	3878		0.3		88		9		55		3	4	2	0.23	3494
45.1	9569	Harvey Creek	S					1208		0.8		106		69		133		2	10	7	1.98	42
45.2	9643	Harvey Creek	R	RC		OC	Fest, sil sc w/ py	<5		1.0		112		107		365		3	20	9	2.26	6
45.3	572	Harvey Creek	R	G		MD	Qz vn	5482		5.9		44		642		110		<1	11	3	0.11	682
45.3	2874	Harvey Creek	R	G		FL	Qz vn	7944		1.1		10		10		111		<1	7	1	0.03	59
45.4	573	Harvey Creek	R	G		MD	Qz vn	341		0.6		32		5		22		<1	18	12	0.18	314
45.4	574	Harvey Creek	R	G		MD	Qz vn	6811		1.6		26		5		17		<1	10	6	0.15	103
45.4	9701	Harvey Creek	R	Rep	2.5	OC	Sil gs sc w/ sulf	20		0.5		174		99		145		7	66	25	1.37	25
45.5	274	Harvey Creek	R	G	0.6	RC	Qz block w/ inclusions of phy, trace py	<5		0.8		43		61		54		3	14	6	0.11	9
45.6	275	Harvey Creek	R	Rep	0.9	RC	Fest qz vn w/ inclusions of phy, trace py	7		0.4		38		18		70		2	9	3	0.37	61
45.6	276	Harvey Creek	R	S	0.05	OC	Py band in fest, sil phy	36		0.3		337		13		99		2	82	68	2.02	25
45.6	9568	Harvey Creek	R	Rep	1.4	OC	Gs w/ dissem py	25		0.4		196		37		306		2	61	35	1.95	34
45.7	9591	Harvey Creek	R	C	2.7	OC	Sc w/ thin bands of dissem sulf	29		0.8		340		62		131		2	72	42	2.10	20
45.8	9644	Harvey Creek	R	Rep	2.3	OC	Sheared, weathered, fest sc w/ py	6		0.5		179		48		246		2	40	19	1.90	7
45.9	277	Harvey Creek	R	S	0.5	RC	Qz vn w/ py in sil, fest phy	<5		0.2		143		13		61		6	39	7	0.40	<5
45.10	9567	Harvey Creek	R	C	1.2	OC	Qz w/ cc & py	6		0.4		184		12		126		5	57	21	0.78	12
46.1	685	Hope	R	Rep	5	OC	Fest qz	37		<0.1		55		21		19		<1	10	6	0.36	9
46.2	686	Hope	R			RC	Qz	7343		0.5		113		85		18		3	9	4	0.29	9
46.3	687	Hope	R	C		OC	Qz	2292		0.5		159		20		18		<1	9	4	0.48	10
46.4	688	Hope	R	C		OC	Qz	43		<0.1		287		13		43		4	18	18	0.98	14
46.5	689	Hope	R	G		OC	Gs sc	21		<0.1		183		5		106		<1	34	46	3.06	41
47.1	9641	Lost Show	R	G		OC	Sil metavolc w/ fg dissem py	9		0.3		115		14		148		2	46	39	2.46	<5
47.2	196	Lost Show	R	C	4	TP	Fest sc w/ py	15		7.7		215		69		589		<1	40	17	0.77	75
47.2	197	Lost Show	R	CC	0.6	TP	Msv py, sl	21		105.6		321		2067		10.90	*	<1	38	25	0.30	49
47.2	198	Lost Show	R	C	4.4	TP	Bands of py & sl in fest sc	84		153.8		259		5519		11.50	*	<1	33	23	0.36	46
47.2	199	Lost Show	R	C	2.4	TP	Fest sc w/ fg py	10		7.4		105		1510		1179		<1	48	26	1.25	49
47.3	2627	Lost Show	R	C	1.2	OC	Ser sc w/ lenses & bands of sl & py	210		5.40	*	235		2.08	*	12.70	*	2	21	17	0.14	34
47.4	2628	Lost Show	R	C	1.9	OC	Msv sulf w/ sl & py in fel sc	450		7.10	*	370		4.20	*	15.30	*	1	33	14	0.08	84
47.4	2629	Lost Show	R	C	1	OC	Sil msv sulf w/ py & sl	90		76.0		230		2150		12.10	*	<1	28	25	0.21	32
47.4	9639	Lost Show	R	SC	7.5@.25	OC	Thinnly bedded sil sc w/ thin banded py, gn, sl	66		83.9		252		5180		4.50	*	1	44	20	0.75	35
47.5	9697	Lost Show	R	C	1.1	TP	Sil metavolc w/ py, gn, sl	392		282.0		258		2.79	*	24.15	*	2	24	18	0.22	49
47.6	9640	Lost Show	R	SC	5.5@.25	OC	Thinnly bedded sil sc w/ thin banded py, gn, sl	133		84.0		179		3217		5.00	*	2	20	13	0.68	25
47.7	510	Lost Show	R	C	1.0	OC	Fest sil andesite w/ bands of py & sl	42		60.0		105		354		5.90	*	<1	26	22	0.68	52
47.8	511	Lost Show	R	C	0.6	TP	Fest br andesite agglomerate w/ py & sl	23		38.0		77		40		2.80	*	<1	20	10	0.36	26
48.1	502	Maid of Mexico Mine	R	C	3	OC	Qz vn	1351		0.3		40		21		30		2	15	5	0.22	9
48.2	2387	Maid of Mexico Mine	R	Rep	1.8	OC	Gray fest qz vn w/ minor py	<5		<0.1		55		30		34		2	14	5	0.18	5
48.3	2381	Maid of Mexico Mine	R	CC	1.3	UW	Qz vn w/ minor py	383		0.5		87		190		237		4	21	6	0.21	229
48.3	2382	Maid of Mexico Mine	R	CC	0.8	UW	Dol, adjacent qz vn	1462		0.5		194		42		112		1	46	30	0.93	1303
48.3	2383	Maid of Mexico Mine	R	CC	0.8	UW	Slate, 1% py, from hanging wall of qz vn	11		<0.1		48		36		85		12	40	5	0.28	64
48.4	505	Maid of Mexico Mine	R	G		MD	Qz vn	540		0.3		40		19		55		4	23	6	0.21	68
48.5	503	Maid of Mexico Mine	R	C	1.5	OC	Qz vn w/ py	1136		1.9		143		1010		267		4	22	11	0.39	18
48.5	724	Maid of Mexico Mine	R	G	0.2	RC	Fest qz vn w/ cp, sl ,gn	351		15.4		8292		2278		2915		3	70	34	0.14	9
48.5	2386	Maid of Mexico Mine	R	Rep		TP	Qz-cc vn w/ py	294		1.0		67		390		42		2	19	9	0.22	10
48.6	9575	Maid of Mexico Mine	R	RC		RC	Qz-rich zone w/ fg sulf @ contact	546		0.5		314		96		317		10	59	20	0.39	<5
48.7	2384	Maid of Mexico Mine	R	CC	0.8	UW	Qz vn in dol w/ minor py	30		3.2		69		1844		29		3	16	6	0.19	<5
48.7	2385	Maid of Mexico Mine	R	Rep	4.5	UW	Sheared dol w/ qz stringers & minor py	679		0.7		139		17		67		2	29	26	0.62	510
48.8	504	Maid of Mexico Mine	R	RC		MD	Qz	13		<0.1		28		104		32		3	11	4	0.31	<5
48.8	2620	Maid of Mexico Mine	R	S	1	MD	Qz vn w/ sulf	80		0.3		100		200		200		<10	20	9	1.33	2

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
44.23	571	Helen S Mine	204	*	<5	3.69	0.6	19	>10	9	0.599	0.03	21	0.90	1603	0.02	<1	<5	19	<4	*	53	<10	0.02	8	<4	*		
44.24	281	Helen S Mine	549	*	<5	2.51	<0.2	128	4.17	<2	0.107	0.13	5	0.41	1237	0.02	<1	<5	<5	<20		46	<10	<0.01	2	<20			
45.1	9569	Harvey Creek	78		<5	0.15	0.3	36	4.19	6	0.426	0.07	5	0.87	326	0.02	5	<5	7	<20		9	<10	0.05	89	<20			
45.2	9643	Harvey Creek	404	*	<5	0.29	1.4	155	7.58	9	0.686	0.08	3	2.58	852	0.04	<1	<5	10	<20		6	<10	0.01	197	<20			
45.3	572	Harvey Creek	184	*	<5	0.09	0.2	243	1.92	<2	1.504	0.07	<1	0.02	98	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	6	9	*		
45.3	2874	Harvey Creek	15	*	<5	<0.01	2.3	233	0.78	<2	0.946	0.02	<1	<0.01	23	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	3	<4	*		
45.4	573	Harvey Creek	290	*	<5	1.56	<0.2	147	2.30	<2	0.090	0.12	2	0.38	569	<0.01	<1	<5	<5	<4	*	19	<10	<0.01	13	18	*		
45.4	574	Harvey Creek	208	*	<5	0.30	<0.2	160	1.73	<2	0.138	0.08	<1	0.09	217	<0.01	<1	<5	<5	<4	*	4	<10	<0.01	10	14	*		
45.4	9701	Harvey Creek	21		<5	3.23	0.6	81	7.07	<2	0.380	0.20	8	2.00	1029	<0.01	6	<5	10	<20		49	<10	<0.01	99	<20			
45.5	274	Harvey Creek	55	*	<5	0.08	0.4	229	1.51	<2	0.156	0.01	<1	0.04	340	0.01	<1	<5	<5	<20		4	<10	<0.01	3	<20			
45.6	275	Harvey Creek	212	*	<5	0.04	0.4	190	2.00	<2	0.195	0.04	<1	0.30	174	0.01	<1	<5	<5	<20		3	<10	<0.01	17	<20			
45.6	276	Harvey Creek	129	*	<5	0.80	0.5	162	15.50	13	0.262	<0.01	5	2.39	1369	0.05	<1	<5	16	<20		12	<10	0.03	262	<20			
45.6	9568	Harvey Creek	3		<5	0.36	0.4	167	15.77	<2	0.387	0.03	5	2.22	696	0.03	10	9	18	<20		5	<10	0.02	248	<20			
45.7	9591	Harvey Creek	126	*	<5	0.79	<0.2	180	11.74	<2	0.252	0.02	7	2.45	1122	0.03	13	<5	19	<20		10	<10	0.08	272	<20			
45.8	9644	Harvey Creek	130	*	<5	0.05	0.9	171	8.73	10	0.363	0.02	3	2.36	731	0.05	<1	<5	17	<20		3	<10	0.02	263	<20			
45.9	277	Harvey Creek	359	*	<5	0.05	0.2	174	6.36	2	0.327	0.07	2	0.31	250	<0.01	<1	<5	<5	<20		2	<10	<0.01	15	<20			
45.10	9567	Harvey Creek	30		<5	7.06	0.2	58	6.83	<2	0.636	0.16	8	2.67	1499	0.01	5	<5	8	<20		134	<10	<0.01	70	<20			
46.1	685	Hope	68	*	<5	0.03	0.3	175	3.00	<2	0.036	<0.01	1	0.20	716	<0.01	5	<5	10	<4	*	<1	<10	<0.01	79	9	*		
46.2	686	Hope	50	*	<5	0.02	0.2	120	2.24	<2	0.107	<0.01	<1	0.17	316	<0.01	4	<5	7	<4	*	<1	<10	<0.01	66	9	*		
46.3	687	Hope	41	*	<5	0.01	0.2	148	1.95	<2	0.071	<0.01	<1	0.30	182	<0.01	6	<5	<5	<4	*	<1	<10	<0.01	85	9	*		
46.4	688	Hope	92	*	<5	0.03	0.6	104	6.52	<2	0.068	<0.01	1	0.53	1267	<0.01	15	<5	17	<4	*	<1	<10	<0.01	199	10	*		
46.5	689	Hope	171	*	<5	0.03	0.7	18	>10	5	0.202	0.02	5	1.68	1790	<0.01	43	<5	36	<4	*	<1	<10	0.01	482	11	*		
47.1	9641	Lost Show	493	*	<5	2.00	0.7	116	6.05	<2	0.353	0.13	3	1.95	940	0.06	<1	<5	5	<20		27	<10	0.58	163	<20			
47.2	196	Lost Show	984	*	<5	0.17	2.5	88	9.11	5	8.955	0.39	1	0.13	4062	<0.01	<1	19	7	<20		4	<10	<0.01	68	<20			
47.2	197	Lost Show	105	*	<5	0.03	658.7	73	13.58	13	>50	0.06	2	0.02	528	<0.01	<1	119	<5	<20		2	38	<0.01	12	121			
47.2	198	Lost Show	85	*	<5	0.13	725.1	69	10.37	10	>50	0.10	2	0.10	3934	<0.01	<1	120	6	<20		3	36	<0.01	34	123			
47.2	199	Lost Show	813	*	<5	0.10	5.4	126	4.41	5	15.719	0.20	1	0.06	385	<0.01	<1	27	23	<20		4	<10	<0.01	111	<20			
47.3	2627	Lost Show	10		<2	0.09	>100.0	123	6.85	10	>100	0.03	<10	0.08	680	<.01		144	4			<1		<.01	19	<10			
47.4	2628	Lost Show	10		<2	0.01	>100.0	87	10.90	10	>100	<.01	<10	<.01	175	<.01		138	<1			<1		<.01	1	<10			
47.4	2629	Lost Show	10		<2	0.03	>100.0	132	10.10	<10	>100	0.01	<10	0.02	545	<.01		44	1			<1		<.01	11	<10			
47.4	9639	Lost Show	834	*	<5	0.18	356.7	123	7.91	7	>50	0.12	3	0.12	888	<0.01	<1	56	14	<20		5	25	<0.01	97	54			
47.5	9697	Lost Show	43	*	<5	0.04	1298.0	52	9.53	8	>50	0.04	<1	<0.01	442	<0.01	<1	142	<5	<20		1	<10	<0.01	17	<20			
47.6	9640	Lost Show	503	*	<5	0.02	289.2	69	13.09	9	>50	0.14	1	0.02	2120	<0.01	<1	80	9	<20		3	24	<0.01	118	54			
47.7	510	Lost Show	452	*	<5	0.01	488.2	131	7.87	<2	44.800	0.12	<1	0.01	1435	<0.01	5	50	13	<1	*	<1	22	0.01	91	<20			
47.8	511	Lost Show	256	*	<5	0.18	164.0	121	9.12	<2	16.940	0.04	3	0.10	11328	<0.01	3	14	11	<1	*	6	13	<0.01	56	<20			
48.1	502	Maid of Mexico Mine	63	*	<5	0.69	0.2	266	1.27	<2	0.211	0.05	<1	0.22	270	<0.01	<1	<5	<5	2	*	10	<10	<0.01	16	<20			
48.2	2387	Maid of Mexico Mine	15	*	<5	0.15	0.8	340	0.83	<2	0.031	0.04	<1	0.07	214	<0.01	<1	<5	<5	<20		3	<10	<0.01	9	<20			
48.3	2381	Maid of Mexico Mine	49	*	<5	3.25	11.5	187	1.57	<2	0.325	0.06	<1	0.38	288	<0.01	2	<5	<5	<20		40	<10	<0.01	16	<20			
48.3	2382	Maid of Mexico Mine	533	*	<5	9.05	6.3	52	6.75	<2	0.251	0.24	3	2.09	1204	0.01	5	<5	9	<20		140	<10	<0.01	62	<20			
48.3	2383	Maid of Mexico Mine	336	*	11	28.09	1.8	19	1.93	<2	0.090	0.15	5	0.66	420	<0.01	6	<5	<5	<20		256	<10	<0.01	9	<20			
48.4	505	Maid of Mexico Mine	115	*	<5	0.90	1.0	316	1.52	<2	0.531	0.09	<1	0.27	253	<0.01	<1	<5	<5	4	*	16	<10	<0.01	16	<20			
48.5	503	Maid of Mexico Mine	289	*	<5	5.87	12.6	163	2.91	<2	1.039	0.18	2	1.15	556	<0.01	1	<5	<5	4	*	66	<10	<0.01	26	<20			
48.5	724	Maid of Mexico Mine	132	*	<5	2.82	151.0	69	6.16	<2	3.994	0.05	<1	0.93	258	<0.01	<1	8	<5	<4	*	45	11	<0.01	21	10	*		
48.5	2386	Maid of Mexico Mine	163	*	<5	2.26	1.7	223	1.45	<2	0.543	0.10	<1	0.47	257	<0.01	2	<5	<5	<20		26	<10	<0.01	13	<20			
48.6	9575	Maid of Mexico Mine	70		<5	5.07	8.9	166	4.58	<2	0.616	0.19	3	1.26	671	0.01	2	<5	<5	<20		117	<10	<0.01	19	<20			
48.7	2384	Maid of Mexico Mine	105	*	<5	3.37	2.6	202	2.02	<2	0.200	0.05	<1	0.50	316	<0.01	2	<5	<5	<20		40	<10	<0.01	20	<20			
48.7	2385	Maid of Mexico Mine	621	*	<5	8.03	2.0	43	6.93	<2	0.637	0.32	3	2.18	1126	0.01	3	<5	7	<20		113	<10	<0.01	33	<20			
48.8	504	Maid of Mexico Mine	77	*	<5	1.09	1.0	280	0.98	<2	0.292	0.06	<1	0.29	203	<0.01	<1	<5	<5	3	*	26	<10	<0.01	16	<20			
48.8	2620	Maid of Mexico Mine	100		<2	5.31	1.0	181	4.22	<10	0.160	0.14	<10	1.65	870	<.01		<2	7			115		<.01	77	<10			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
48.9	8748	Maid of Mexico Mine	R	C	2.5	OC	Fest sc w/ qz lenses, sil sulf bands	19		0.4		158		13		87		19	46	38	0.74	39
48.9	8749	Maid of Mexico Mine	R	C	4.3	OC	Fest sc w/ qz lenses, sil sulf bands	29		0.8		101		10		53		12	65	44	0.60	83
48.10	506	Maid of Mexico Mine	R	G		MD	Qz vn	8289		3.6		124		922		1688		6	20	8	0.25	10
48.11	2388	Maid of Mexico Mine	R	RC			Mill feed of dol & qz	2098		3.5		234		1358		693		3	39	24	0.49	425
48.11	2389	Maid of Mexico Mine	R	S			Mill concentrate, ~80% py	1.020	*	2.62	*	981		4226		679		9	216	117	1.22	4297
48.11	2390	Maid of Mexico Mine	R	S			Mill concentrate, ~90% py	1.076	*	3.17	*	1224		2.05	*	746		10	201	113	1.16	2790
48.12	507	Maid of Mexico Mine	R	S			Qz crushed +1/2", mill feed	6584		6.0		265		1567		1138		6	33	15	0.31	426
48.12	508	Maid of Mexico Mine	R	G			Mill concentrate, mainly py	1.386	*	106.0		1109		7589		665		7	212	113	0.17	4186
49.1	723	Maid of Texas	SS					23		<0.2		77		11		645		27	128	18	1.33	42
49.2	827	Maid of Texas	R	G		FL	Fest qz	<5		<0.1		4		<2		33		2	13	1	0.08	<5
49.3	722	Maid of Texas	R	G	0.4	FL	Fest vuggy qz vn	<5		<0.1		41		10		33		4	9	1	0.09	<5
49.4	720	Maid of Texas	R	C	.95	RC	Qz vn	8		<0.1		79		6		159		18	24	16	0.15	11
49.4	826	Maid of Texas	SS					10		<0.2		60		16		782		20	92	21	0.83	44
49.5	721	Maid of Texas	R	G	0.4	FL	Qz vn w/ gossan	7		<0.1		147		7		419		29	54	17	0.26	34
49.6	509	Maid of Texas	R	C	1.1	OC	Fest calc-silicate w/ finely dissem py	68		0.6		127		45		87		14	47	35	1.03	58
49.6	8747	Maid of Texas	R	C	0.2	OC	Fest sc w/ banded py	51		0.4		172		6		81		28	43	35	0.37	76
49.7	825	Maid of Texas	R	G		FL	Qz	<5		<0.1		6		<2		8		4	7	7	0.15	<5
50.1	538	East of Harvey Lake	R	G	0.4	RC	Sil rock w/ msv py	21		5.8		49		204		1023		20	6	3	0.06	128
50.1	539	East of Harvey Lake	R	C	0.8	OC	Sil rock w/ msv py	<5		0.3		8		29		86		<1	3	<1	0.27	21
50.2	537	East of Harvey Lake	R	G	1.0	OC	Black gp sc/phy w/ bands of py	58		1.8		26		154		819		45	65	21	0.15	114
50.3	9571	East of Harvey Lake	R	Rep	1.8	OC	Fest sil sc	<5		0.2		151		6		119		5	51	38	3.25	22
50.4	384	East of Harvey Lake	R	G	0.4	RC	Sil sc w/ bands of py	<5		0.7		180		105		207		4	62	46	1.29	27
50.4	8650	East of Harvey Lake	R	C	3.7	OC	Fest sc w/ dissem py	12		<0.1		114		12		111		3	34	35	3.68	30
50.4	9699	East of Harvey Lake	R	C	5.1	OC	Fest sc w/ dissem py	<5		0.3		140		28		284		3	38	29	3.07	10
51.1	334	Scott	R	CC	0.3	OC	Gs sc w/ barite, py, sl	383		5.4		425		1942		3.90	*	2	35	46	0.85	17
51.2	325	Scott	R	G	0.4	FL	Qz & gs w/ fg, msv py	8157		3.1		196		289		4547		5	37	27	0.27	8
51.3	330	Scott	R	C	0.45	OC	Msv py	112		7.4		174		1064		6510		3	56	52	0.10	16
51.4	331	Scott	R	C	0.4	OC	Barite	<5		0.3		<1		28		354		<1	<1	<1	<0.01	<5
51.5	327	Scott	R	C	0.6	OC	Gs & gs sc	12		2.4		199		78		520		2	50	38	3.98	7
51.6	328	Scott	R	CC	0.7	OC	Msv py w/ sl & gn	213		10.8		156		761		1.70	*	2	62	50	0.07	25
51.7	326	Scott	R	Rep	0.7	OC	Msv py w/ sl & gn	276		38.0		218		9706		14.20	*	<1	57	55	0.15	24
51.7	329	Scott	R	CC	0.3	OC	Msv sl w/ gn	266		94.0		59		2.63	*	40.88	*	<1	10	66	0.32	35
51.8	333	Scott	R	CC	1	OC	Gs & gs sc	6		1.0		138		22		228		<1	34	34	2.97	5
51.9	332	Scott	R	CC	0.9	OC	Msv py	158		12.8		104		362		5651		<1	63	47	0.07	14
51.10	335	Scott	R	C	1	OC	Gray to green gs sc w/ py, sl, barite	33		17.0		277		5853		9794		6	48	48	0.57	20
51.11	336	Scott	R	CC	0.1	OC	Msv sulf band w/ sl	1122		15.3		1599		715		5.40	*	1	27	67	0.43	86
51.12	338	Scott	R	C	0.7	OC	Green sc	<5		0.2		121		33		303		<1	32	31	2.74	<5
51.13	337	Scott	R	CC	0.3	OC	Msv py w/ sl	265		15.1		400		2657		9.00	*	2	39	49	0.15	15
51.14	342	Scott	R	CH	0.2	OC	Msv py w/ bands of sl	139		6.5		641		356		1.00	*	2	35	53	0.05	23
51.15	339	Scott	R	Rep	1	OC	Blocky gs w/ py	<5		0.5		92		11		214		<1	19	26	2.34	<5
51.16	343	Scott	R	C	0.5	OC	Fault gouge w/ sc fragments	<5		0.6		206		18		292		<1	33	34	2.73	<5
51.17	340	Scott	R	C	2	OC	Msv py w/ bands of gs & sl	175		11.8		202		2275		6.70	*	2	50	53	0.67	32
51.18	341	Scott	R	C	1	OC	Gs sc w/ dissem py, sl	39		9.6		289		1872		1.50	*	2	40	40	2.77	19
51.19	9677	Scott	R	C	1.4	OC	Band of msv py & sl	166		24.2		137		1007		6.30	*	3	34	40	0.02	16
51.20	9678	Scott	R	C	1.2	OC	Band of msv py w/ thin fingers of sc	177		22.6		231		641		1.06	*	3	42	57	0.79	24
51.21	9675	Scott	R	C	0.8	OC	Msv banded sl, py	575		31.3		286		4630		14.20	*	4	28	42	0.69	19
51.22	9674	Scott	R	C	1.4	OC	Band of msv py	319		9.7		151		280		1.26	*	2	24	24	0.18	11
51.23	9676	Scott	R	C	0.4	OC	Msv py lens	927		7.4		41		320		1527		3	21	17	0.09	8
51.24	9673	Scott	R	C	5	OC	Gray sc to phy w/ to 0.4 ft bands of msv py	125		4.1		294		106		1.50	*	3	43	42	1.61	19

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
48.9	8748	Maid of Mexico Mine	425	*	<5	1.51	<0.2	47	>10	<2	0.478	0.17	3	0.52	513	0.02	3	6	9	19	*	27	<10	<0.01	67	<20			
48.9	8749	Maid of Mexico Mine	425	*	<5	4.70	<0.2	111	>10	<2	2.921	0.27	3	0.63	597	0.01	<1	15	<5	12	*	64	<10	<0.01	37	<20			
48.10	506	Maid of Mexico Mine	280	*	<5	5.90	66.2	153	2.15	<2	2.120	0.13	1	0.66	419	<0.01	<1	<5	<5	6	*	79	<10	<0.01	18	<20			
48.11	2388	Maid of Mexico Mine	461	*	<5	6.80	32.0	155	6.32	<2	1.635	0.27	2	2.21	909	0.01	2	8	6	86		141	<10	<0.01	27	<20			
48.11	2389	Maid of Mexico Mine	123	*	<5	0.04	38.9	10	39.68	<2	>50	0.04	<1	0.01	20	<0.01	<1	38	<5	<20		3	12	<0.01	<1	<20			
48.11	2390	Maid of Mexico Mine	138	*	<5	0.02	37.8	2	40.93	<2	>50	0.04	<1	<0.01	13	<0.01	<1	26	<5	<20		4	12	<0.01	<1	<20			
48.12	507	Maid of Mexico Mine	312	*	<5	4.59	40.4	230	3.69	<2	4.540	0.17	2	1.27	643	0.01	<1	7	<5	6	*	81	<10	<0.01	22	<20			
48.12	508	Maid of Mexico Mine	73	*	<5	0.06	36.4	60	>10	<2	50.000	0.07	<1	0.03	28	<0.01	<1	32	<5	7	*	4	35	<0.01	30	<20			
49.1	723	Maid of Texas	476	*	<5	0.63	9.1	31	5.82	<2		0.03	9	0.66	1277	0.02	10	17	<5	<20		18	<10	0.041	123	<20			
49.2	827	Maid of Texas	30	*	<5	0.05	0.3	170	0.42	<2	0.045	0.01	<1	0.04	65	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	11	8	*		
49.3	722	Maid of Texas	28	*	<5	0.02	0.3	142	0.81	<2	0.043	<0.01	<1	0.03	61	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	15	8	*		
49.4	720	Maid of Texas	113	*	<5	0.02	1.3	105	8.76	<2	0.082	0.03	<1	0.01	653	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	25	9	*		
49.4	826	Maid of Texas	185	*	<5	0.52	5.0	13	>10	4		0.03	28	0.29	867	0.03	3	12	<5	<20		45	11	0.03	67	<20			
49.5	721	Maid of Texas	227	*	<5	<0.01	2.5	64	>10	<2	0.235	0.06	3	0.01	488	<0.01	<1	5	<5	<4	*	<1	<10	<0.01	39	9	*		
49.6	509	Maid of Texas	650	*	<5	0.03	0.4	78	>10	<2	6.280	0.15	2	0.05	320	0.01	4	8	12	14	*	1	<10	<0.01	97	<20			
49.6	8747	Maid of Texas	274	*	<5	0.03	<0.2	35	>10	<2	0.381	0.11	2	0.04	237	0.02	<1	12	6	28	*	<1	<10	<0.01	29	<20			
49.7	825	Maid of Texas	67	*	<5	0.03	<0.2	159	0.59	<2	0.125	0.02	<1	0.06	284	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	9	8	*		
50.1	538	East of Harvey Lake	11	*	<5	0.01	7.4	98	>10	<2	0.795	<0.01	<1	<0.01	113	<0.01	<1	16	<5	20	*	<1	<10	<0.01	18	<20			
50.1	539	East of Harvey Lake	<10	*	<5	<0.01	0.5	142	1.21	2	0.550	0.16	3	<0.01	18	0.08	1	<5	<5	<1	*	<1	<10	<0.01	2	<20			
50.2	537	East of Harvey Lake	24	*	<5	0.02	5.4	85	>10	<2	4.999	0.04	<1	0.01	202	<0.01	<1	22	<5	45	*	<1	<10	<0.01	54	<20			
50.3	9571	East of Harvey Lake	5		<5	1.84	<0.2	116	15.50	3	0.281	0.09	3	3.05	1139	<0.01	8	<5	18	<20		18	<10	<0.01	198	<20			
50.4	384	East of Harvey Lake	2351	*	<5	4.35	<0.2	73	>10	<2	0.446	0.09	4	1.55	1045	<0.01	<1	<5	16	<20		48	<10	<0.01	144	<20			
50.4	8650	East of Harvey Lake	2756	*	<5	0.34	<0.2	145	>10	<2	0.065	0.09	1	3.42	935	0.03	3	<5	14	<20		5	<10	0.19	239	<20			
50.4	9699	East of Harvey Lake	2470	*	<5	1.22	0.6	120	>10	<2	0.769	0.06	2	2.71	884	0.02	3	<5	17	<20		14	<10	0.12	228	<20			
51.1	334	Scott	3189	*	<5	2.66	230.8	131	7.50	<2	5.393	0.50	<1	0.23	509	0.03	<1	<5	<5	<20		15	<10	0.25	58	<20			
51.2	325	Scott	10204	*	<5	0.37	23.0	203	1.58	<2	1.360	0.16	<1	0.09	161	0.05	1	<5	<5	<20		27	<10	0.19	56	<20			
51.3	330	Scott	**10.81%**	*	<5	2.68	22.7	39	>10	<2	1.021	0.07	<1	0.03	803	<0.01	<1	24	<5	<20		16	<10	0.03	10	<20			
51.4	331	Scott	**56.35%**	*	<5	0.10	2.8	2	0.22	<2	0.069	<0.01	<1	<0.01	18	<0.01	<1	<5	<5	<20		219	<10	<0.01	<1	<20			
51.5	327	Scott	951	*	<5	2.77	2.0	113	9.39	<2	0.112	1.46	<1	3.01	1249	0.06	2	<5	9	<20		26	<10	0.57	270	<20			
51.6	328	Scott	3931	*	<5	1.72	100.8	56	>10	<2	3.024	0.04	<1	0.05	212	<0.01	<1	6	<5	<20		15	<10	0.01	2	<20			
51.7	326	Scott	6900	*	<5	1.51	990.4	42	>10	<2	23.500	0.08	<1	0.07	215	<0.01	<1	19	<5	<20		12	<10	0.02	7	55			
51.7	329	Scott	957	*	<5	0.12	>2000	38	>10	26	>50	0.22	<1	0.09	301	<0.01	<1	54	<5	<20		3	<10	0.05	20	255			
51.8	333	Scott	2546	*	<5	4.07	0.5	146	6.51	<2	0.052	0.84	1	2.47	1010	0.06	2	<5	9	<20		52	<10	0.44	194	<20			
51.9	332	Scott	**8.75%**	*	<5	1.79	38.3	43	>10	<2	1.207	0.03	<1	0.05	210	<0.01	<1	<5	<5	<20		10	<10	0.01	2	<20			
51.10	335	Scott	3522	*	<5	3.46	44.4	59	2.07	<2	1.944	0.39	1	0.06	789	0.03	<1	7	<5	<20		19	<10	0.38	62	<20			
51.11	336	Scott	490	*	<5	0.27	394.2	75	>10	<2	11.720	0.22	<1	0.13	157	0.01	1	6	<5	<20		4	<10	0.13	30	<20			
51.12	338	Scott	1552	*	<5	3.02	1.3	171	5.39	<2	0.057	0.57	2	2.24	958	0.06	2	<5	7	<20		63	<10	0.31	139	<20			
51.13	337	Scott	1753	*	<5	0.85	649.8	57	>10	<2	17.720	0.11	<1	0.09	118	<0.01	<1	9	<5	<20		19	<10	0.04	13	<20			
51.14	342	Scott	7031	*	<5	2.66	62.0	51	>10	<2	2.172	0.04	<1	0.02	563	<0.01	<1	16	<5	<20		26	<10	0.03	5	<20			
51.15	339	Scott	1865	*	<5	1.97	1.1	128	3.50	<2	0.035	0.24	2	1.85	637	0.10	1	<5	5	<20		187	<10	0.23	87	<20			
51.16	343	Scott	2343	*	<5	2.79	1.0	132	5.49	<2	0.060	0.63	2	2.24	957	0.07	2	<5	8	<20		94	<10	0.49	158	<20			
51.17	340	Scott	1715	*	<5	1.11	484.2	64	>10	<2	14.936	0.23	<1	0.29	314	<0.01	<1	<5	<5	<20		21	<10	0.10	31	<20			
51.18	341	Scott	7547	*	<5	1.66	78.1	71	7.82	<2	3.780	1.49	<1	1.02	899	0.01	1	<5	10	<20		14	<10	0.49	139	<20			
51.19	9677	Scott	**12.24%**	*	<5	1.97	330.3	32	>10	<2	13.559	0.02	<1	0.01	433	<0.01	<1	21	<5	<20		10	<10	<0.01	<1	<20			
51.20	9678	Scott	5765	*	<5	2.23	63.7	59	>10	<2	3.230	0.41	<1	0.31	498	0.01	<1	7	<5	<20		35	<10	0.11	57	<20			
51.21	9675	Scott	1865	*	<5	2.59	979.4	47	>10	7	26.320	0.23	<1	0.21	428	<0.01	<1	41	<5	<20		22	36	0.12	38	143			
51.22	9674	Scott	**7.01%**	*	<5	1.09	36.4	18	9.28	<2	2.047	0.08	<1	0.06	175	<0.01	<1	<5	<5	<20		5	<10	0.02	7	<20			
51.23	9676	Scott	**26.34%**	*	<5	4.53	5.7	28	>10	2	0.349	0.03	3	0.04	553	<0.01	1	<5	<5	<20		24	<10	0.03	13	<20			
51.24	9673	Scott	18640	*	<5	3.90	91.8	69	>10	<2	3.639	0.75	<1	0.48	1113	0.01	<1	<5	<5	<20		25	<10	0.36	91	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
51.25	9680	Scott	R	Rep	0.3	OC	Gray sc w/ minor dissem py	40		2.4		203		99		2260		2	45	36	3.04	9
51.26	9679	Scott	R	C	2.1	OC	Msv py & sl	1011		47.3		269		2157		10.30	*	3	42	56	0.32	24
51.27	9681	Scott	SS					24		0.4		109		45		265		1	37	32	2.90	<5
51.28	9672	Scott	R	C	0.4	OC	Gray to green gs sc w/ minor py	19		0.5		205		13		231		3	21	17	1.35	5
51.29	9671	Scott	R	C	0.5	OC	Sil zone w/ cc, py, trace gn & sl in gray sc	376		3.1		161		380		1245		4	42	26	0.36	12
52.1	839	Scott Gold	S					9		<0.2		115		6		73		<1	33	34	3.28	<5
52.2	838	Scott Gold	S					8		<0.2		79		5		80		<1	31	16	2.63	6
52.3	837	Scott Gold	SS					11		<0.1		99		74		336		2	34	41	3.23	<5
52.4	836	Scott Gold	S					<5		<0.2		68		28		261		<1	23	12	2.03	<5
52.5	835	Scott Gold	S					11		0.6		211		20		538		<1	42	38	4.72	6
52.6	735	Scott Gold	SS					51		<0.2		137		35		219		<1	41	53	3.72	20
52.7	734	Scott Gold	R	Rep		RC	Qz band w/ py, sl, gn	834		2.1		118		826		2.52	*	3	6	7	0.08	<5
52.8	732	Scott Gold	R	Rep	0.4	RC	Qz-cc band w/ py, sl, gn	1793		6.8		427		2048		9428		<1	7	6	0.13	<5
52.8	733	Scott Gold	R	G	0.5	RC	Sil gray-green volc	<5		<0.1		21		23		52		2	12	9	1.79	7
52.9	9682	Scott Gold	R	Rep		RC	Pale gray alt volc w/ qz & sl	1449		12.6		150		2559		1.30	*	3	10	14	0.18	9
53.1	491	Boulder Point	R	Rep	1.4	TP	Fest sil andesite w/ 20% po	6		0.5		929		13		37		4	80	172	0.74	57
53.2	489	Boulder Point	R	RC	10	OC	Fest andesite w/ po on fractures & dissem	<5		<0.1		246		5		31		3	43	50	1.73	<5
53.2	490	Boulder Point	R	S		RC	Sil andesite w/ po & sparse cp on fractures	6		<0.1		592		8		26		4	43	88	1.14	11
54.1	492	Finzens	R	Rep	4	OC	Fest calc sil andesite w/ fg py	<5		<0.1		204		6		95		2	57	27	1.39	<5
54.1	493	Finzens	SS					<5		<0.1		48		12		87		<1	26	40	2.15	5
54.1	494	Finzens	SS					<5		0.2		79		11		133		<1	40	35	2.96	<5
54.2	495	Finzens	R	S	1.0	OC	Fest sil basalt w/ po & cp	17		0.9		1943		12		42		2	65	85	1.17	<5
54.2	496	Finzens	SS					<5		<0.1		61		13		116		<1	37	33	2.61	7
54.3	8740	Finzens	R	RC		RC	Sil sc w/ dissem & bands of fg py	6		0.3		239		7		126		2	60	35	1.27	36
54.4	8741	Finzens	R	Rep	1.2	OC	Qz vn cutting andesite	6		0.2		92		6		31		2	9	10	0.45	<5
55.1	711	Fortunate 1-3	R	CC	0.3	OC	Qz-cc vn	16		<0.1		108		3		54		6	3	6	1.05	<5
55.2	9723	Fortunate 1-3	R	Rep	3	OC	Fest sil sc w/ py & sl bands	3927		43.0		597		5528		4.30	*	<1	17	35	1.05	18
55.3	211	Fortunate 1-3	R	G		OC	Sulf bands in sil gs	255		617.0		868		7.39	*	20.11	*	1	19	61	0.51	53
55.3	212	Fortunate 1-3	R	Rep	3	OC	Qz w/ sulf	420		54.0		663		341		3951		2	4	10	0.68	<5
55.3	536	Fortunate 1-3	R	C	0.5	OC	Fest sil sc w/ py & sl bands	597		500.0		774		>10000		>15.00	*	2	28	34	0.22	76
55.3	9724	Fortunate 1-3	R	C	0.4	OC	Fest sil sc w/ py & sl bands	100		79.0		678		>10000		14.60	*	2	28	45	0.46	91
55.4	9718	Fortunate 1-3	R	S	0.4	OC	Fest sil sc w/ py & sl bands	130		156.0		1026		>10000		>15.00	*	4	62	48	0.71	140
55.4	9719	Fortunate 1-3	R	Rep	4.5	OC	Fest sil sc w/ py & sl bands	187		127.0		465		3764		17.02	*	2	54	47	0.61	140
55.4	9720	Fortunate 1-3	R	Rep	2.9	OC	Fest sil sc w/ py & sl bands	585		76.0		431		9640		3.10	*	7	32	25	0.79	16
55.4	9721	Fortunate 1-3	R	S	0.2	OC	Fest sil sc w/ py & sl bands	189		55.0		170		3413		2.10	*	7	13	28	0.88	10
55.4	9722	Fortunate 1-3	R	S		OC	Fest sil sc w/ py & sl bands	746		67.0		617		1.28	*	5.10	*	6	39	31	0.56	25
55.5	533	Fortunate 1-3	R	C	1.4	OC	Fest sil sc w/ py & sl bands	58		101.0		716		4274		2.00	*	3	19	47	0.77	25
55.5	535	Fortunate 1-3	R	C	0.7	OC	Fest sil sc w/ py & sl bands	238		392.0		594		>10000		14.80	*	4	41	59	0.72	72
55.6	28	Fortunate 1-3	R	Rep	0.08	OC	Sulf band in sil gs	295		630.4		256		9.76	*	18	*	2	14	45	0.46	35
55.6	29	Fortunate 1-3	R	Rep	2	OC	Fest gs w/ bands of fg sulf	1590		188.0		902		1.49	*	10.70	*	1	25	42	0.72	49
55.6	534	Fortunate 1-3	R	C	0.4	OC	Fest sil sc w/ py & sl bands	118		45.6		327		6423		8.00	*	3	43	71	1.27	117
56.1	518	Hattie	R	Rep	1.0	OC	Fest sil sc	<5		<0.1		76		12		51		2	41	14	0.73	<5
56.1	9714	Hattie	R	Rep	4.3	OC	Qz vn	<5		<0.1		8		52		12		5	21	1	0.06	<5
56.2	715	Hattie	R	C	8.5	TP	Qz vn	9		<0.1		3		8		4		<1	8	2	0.08	<5
56.3	818	Hattie	R	G	0.3	TP	Qz vn w/ py	37		0.3		19		8		17		<1	25	10	0.24	5
56.4	512	Hattie	R	G		MD	Qz w/ ser, chl, & sparse py	9		<0.1		11		13		86		2	24	8	0.56	<5
56.5	8750	Hattie	R	G		MD	Sil volc w/ qz vn & py	23		<0.1		48		5		51		2	58	26	1.23	6
56.6	27	Hattie	R	G		MD	Qz	<5		<0.1		7		3		16		2	16	7	0.29	<5
56.7	2636	Hattie	R	Rep	6	OC	Qz vn	<5		<0.2		60		<1		19		2	10	5	0.11	<2

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
51.25	9680	Scott	4234	*	<5	2.99	11.8	75	7.92	<2	0.411	0.55	<1	1.44	1276	0.01	1	<5	7	<20		40	<10	0.41	122	<20			
51.26	9679	Scott	2934	*	<5	0.37	683.3	63	>10	<2	20.360	0.18	<1	0.11	147	<0.01	<1	6	<5	<20		4	<10	0.05	21	<20			
51.27	9681	Scott	1113	*	<5	0.71	1.0	98	6.64	8	0.145	0.35	3	2.04	1659	0.01	13	<5	<5	<20		20	<10	0.41	166	<20			
51.28	9672	Scott	4142	*	<5	3.59	0.4	35	3.03	<2	0.027	0.47	<1	0.75	733	<0.01	<1	<5	<5	<20		24	<10	0.20	58	<20			
51.29	9671	Scott	**11.17%**	*	<5	4.27	3.6	56	9.10	<2	1.486	0.26	<1	0.08	565	<0.01	<1	7	<5	<20		25	<10	0.22	33	<20			
52.1	839	Scott Gold	229	*	<5	0.63	0.2	132	6.96	<2		0.03	5	0.79	495	0.03	13	<5	<5	<20		29	<10	0.50	143	<20			
52.2	838	Scott Gold	609	*	<5	0.36	<0.2	55	4.35	<2		0.11	7	0.94	374	0.03	8	<5	<5	<20		20	<10	0.20	91	<20			
52.3	837	Scott Gold	1000	*	<5	0.69	0.7	112	6.41	<2		0.23	4	1.35	2253	0.02	10	<5	<5	<20		24	<10	0.35	136	<20			
52.4	836	Scott Gold	578	*	<5	0.46	0.5	50	2.81	<2		0.08	6	0.74	334	0.03	6	<5	<5	<20		20	<10	0.15	64	<20			
52.5	835	Scott Gold	943	*	<5	0.53	1.0	127	7.56	<2		0.29	3	1.80	885	0.02	12	<5	6	<20		28	<10	0.50	153	<20			
52.6	735	Scott Gold	1278	*	<5	0.75	0.5	135	7.88	<2		0.40	3	1.78	3227	0.02	11	<5	<5	<20		24	<10	0.41	162	<20			
52.7	734	Scott Gold	>20000	*	<5	1.42	152.4	47	0.76	5	3.926	0.03	<1	0.02	102	<0.01	<1	14	<5	<4	*	59	25	0.03	11	<4	*		
52.8	732	Scott Gold	>20000	*	<5	0.69	53.6	61	0.51	<2	1.640	0.07	<1	0.02	123	<0.01	1	7	<5	<4	*	131	<10	0.06	13	<4	*		
52.8	733	Scott Gold	852	*	<5	4.54	0.2	43	2.15	4	0.016	0.04	2	0.65	566	0.02	6	<5	5	<4	*	248	<10	0.23	80	8	*		
52.9	9682	Scott Gold	**13.76%**	*	<5	0.68	76.0	93	0.89	<2	2.820	0.11	<1	0.01	94	0.01	<1	<5	<5	<20		74	<10	0.20	32	<20			
53.1	491	Boulder Point	<10	*	<5	1.20	<0.2	32	>10	<2	0.046	0.01	1	0.07	97	0.01	3	<5	5	4	*	43	<10	0.36	72	<20			
53.2	489	Boulder Point	537	*	<5	2.01	<0.2	55	5.91	<2	0.051	0.10	2	0.95	395	0.14	10	<5	7	3	*	56	<10	0.71	138	<20			
53.2	490	Boulder Point	15	*	<5	1.88	1.7	45	>10	<2	0.052	0.01	2	0.22	182	0.05	7	<5	8	4	*	84	<10	0.49	103	<20			
54.1	492	Finzens	546	*	<5	3.29	<0.2	115	6.68	<2	0.920	0.13	4	1.60	879	0.05	13	<5	27	2	*	78	<10	0.02	203	<20			
54.1	493	Finzens	517	*	<5	0.63	0.2	54	5.78	<2	0.153	0.09	4	1.26	2907	0.02	11	<5	6	<20		30	<10	0.24	165	<20			
54.1	494	Finzens	395	*	<5	0.68	<0.2	93	6.05	<2	0.158	0.10	4	2.02	1380	0.02	9	<5	7	<20		27	<10	0.34	143	<20			
54.2	495	Finzens	173	*	<5	1.48	0.2	117	>10	<2	0.165	0.02	2	0.39	213	0.08	6	<5	9	2	*	54	<10	0.45	94	<20			
54.2	496	Finzens	528	*	<5	0.70	<0.2	83	5.57	<2	0.171	0.11	4	1.84	1399	0.02	8	<5	7	<20		31	<10	0.32	134	<20			
54.3	8740	Finzens	165	*	<5	2.64	0.8	100	7.42	<2	0.606	0.05	4	1.99	983	0.03	11	<5	23	2	*	86	<10	<0.01	170	<20			
54.4	8741	Finzens	36	*	<5	4.21	<0.2	144	1.47	<2	0.069	0.01	4	0.30	212	0.12	2	<5	<5	2	*	36	<10	0.03	27	<20			
55.1	711	Fortunate 1-3	292	*	<5	>10	0.4	21	4.64	<2	0.042	<0.01	4	1.63	2851	0.01	4	<5	14	5	*	415	<10	<0.01	56	9	*		
55.2	9723	Fortunate 1-3	816	*	<5	0.73	158.3	101	9.09	<2	15.120	0.20	6	0.60	5959	0.04	5	26	19	<1	*	24	14	0.02	102	<20			
55.3	211	Fortunate 1-3	334	*	<5	0.27	1437.6	46	7.38	<2	>50	0.06	2	0.26	1140	0.03	<1	642	6	<20		14	<10	<0.01	30	<20			
55.3	212	Fortunate 1-3	568	*	<5	0.58	17.0	121	5.88	<2	1.989	0.09	5	0.38	3868	0.03	<1	21	12	<20		27	<10	0.01	25	<20			
55.3	536	Fortunate 1-3	67	*	<5	0.32	2000.0	79	6.89	4	50.000	0.06	2	0.16	2964	0.01	<1	376	<5	2	*	10	24	0.01	23	<20			
55.3	9724	Fortunate 1-3	751	*	<5	0.40	974.2	77	6.52	<2	40.340	0.15	4	0.30	2515	0.02	<1	38	7	2	*	9	<10	<0.01	15	<20			
55.4	9718	Fortunate 1-3	258	*	<5	0.20	1131.7	139	>10	<2	50.000	0.11	2	0.17	921	0.04	<1	113	<5	4	*	16	<10	0.02	39	<20			
55.4	9719	Fortunate 1-3	883	*	<5	0.90	1420.2	125	5.01	<2	41.620	0.26	2	0.29	2742	0.05	<1	92	<5	2	*	37	18	0.01	26	<20			
55.4	9720	Fortunate 1-3	1792	*	<5	0.80	186.4	132	>10	<2	25.460	0.09	7	0.41	6960	0.05	<1	60	9	7	*	30	<10	0.02	27	<20			
55.4	9721	Fortunate 1-3	325	*	<5	0.89	180.8	238	5.91	<2	8.300	0.05	8	0.51	2853	0.05	<1	47	8	7	*	43	<10	0.01	24	<20			
55.4	9722	Fortunate 1-3	1502	*	<5	0.54	318.6	120	>10	<2	40.220	0.07	5	0.24	2991	0.03	<1	48	6	6	*	19	15	0.02	32	<20			
55.5	533	Fortunate 1-3	1096	*	<5	0.44	96.1	147	4.50	<2	10.594	0.28	4	0.38	1738	0.04	4	110	7	3	*	22	<10	0.01	63	<20			
55.5	535	Fortunate 1-3	268	*	<5	0.11	848.6	116	6.66	<2	50.000	0.09	2	0.29	1239	0.04	3	231	7	4	*	6	29	0.01	63	<20			
55.6	28	Fortunate 1-3	201	*	<5	0.29	1435.7	62	6.10	<2	>50	0.06	1	0.18	748	0.03	<1	324	5	<20		17	17	<0.01	33	<20			
55.6	29	Fortunate 1-3	1655	*	<5	0.54	774.0	53	9.05	<2	37.200	0.14	3	0.42	5348	0.03	<1	148	14	<20		15	<10	0.01	71	<20			
55.6	534	Fortunate 1-3	1184	*	<5	2.67	397.5	66	5.46	<2	16.120	0.45	4	0.45	1592	0.04	17	28	8	3	*	44	16	0.02	240	<20			
56.1	518	Hattie	1228	*	<5	6.94	<0.2	98	3.05	<2	0.198	0.32	1	2.80	679	0.03	2	<5	<5	2	*	54	<10	<0.01	26	<20			
56.1	9714	Hattie	<10	*	<5	0.09	<0.2	456	0.62	<2	0.047	0.01	<1	0.02	56	0.02	<1	<5	<5	5	*	6	<10	<0.01	5	<20			
56.2	715	Hattie	36	*	<5	0.02	<0.2	137	1.27	<2	5.111	<0.01	<1	0.01	43	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	10	8	*		
56.3	818	Hattie	77	*	<5	0.15	0.2	112	9.86	<2	24.040	<0.01	1	0.07	170	<0.01	<1	<5	<5	<4	*	4	<10	<0.01	23	9	*		
56.4	512	Hattie	672	*	<5	4.56	1.0	168	2.44	<2	0.655	0.14	1	1.50	645	<0.01	1	<5	9	2	*	89	<10	<0.01	27	<20			
56.5	8750	Hattie	262	*	<5	6.25	<0.2	147	7.60	<2	0.527	0.07	2	2.63	879	<0.01	6	11	25	2	*	136	<10	<0.01	99	<20			
56.6	27	Hattie	79	*	<5	0.75	<0.2	230	1.72	<2	0.737	0.03	<1	0.26	361	<0.01	<1	<5	5	<20		15	<10	<0.01	21	<20			
56.7	2636	Hattie	30		<2	0.99	<.5	245	1.74	<10	0.070	<.01	<10	0.40	325	<.01		<2	5			20		<.01	46	<10			

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Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
56.8	714	Hattie	R	RC	5	OC	Fest sil rhyolite	7		<0.1		161		4		116		2	90	61	1.13	<5
56.9	9715	Hattie	R	Rep	6	OC	Qz vn	<5		<0.1		9		7		12		4	14	3	0.12	<5
56.10	713	Hattie	R		5.5	OC	Qz vn	<5		<0.1		3		<2		4		2	6	1	0.05	<5
56.11	520	Hattie	R	C	1.5	OC	Qz vn	<5		<0.1		14		9		21		2	21	6	0.32	<5
56.12	712	Hattie	R	Rep		OC	Qz vn	22		<0.1		5		<2		21		<1	22	11	0.20	<5
56.13	519	Hattie	R	G		MD	Qz vn	<5		<0.1		28		3		17		4	22	4	0.22	<5
56.14	6956	Hattie	R	C	0.42	UW	Qz-cc vn in shear, host is alt intrusive	<5		<0.1		6		<2		36		2	43	18	2.77	<5
56.15	2630	Hattie	R	C	5	OC	Qz vn	<5		0.4		6		76		186		2	6	2	0.08	<2
56.16	2631	Hattie	R	C	5	OC	Qz vn	10		<0.2		3		10		148		1	6	1	0.11	6
56.17	2634	Hattie	R	C	4.5	OC	Qz vn	<5		<0.2		3		2		25		3	9	3	0.10	<2
56.18	2632	Hattie	R	C	1.75	OC	Qz vn	<5		<0.2		7		6		26		3	7	2	0.06	2
56.19	2633	Hattie	R	C	0.7	OC	Qz vn	<5		<0.2		5		2		25		2	8	3	0.15	4
56.20	6950	Hattie	R	C	4.8	UW	Qz vn in alt volc, minor py	134		<0.1		5		3		10		5	13	6	0.15	<5
56.21	6951	Hattie	R	C	2.3	UW	Sheared, alt volc w/ qz, 2-3% sulf	11		<0.1		34		<2		52		2	39	22	0.57	<5
56.22	6953	Hattie	R	C	3.9	UW	Sheared volc/intrusive, minor sulf	<5		<0.1		51		<2		43		2	60	25	2.98	<5
56.23	6954	Hattie	R	C	5.5	UW	Sheared, alt volc w/ minor fg sulf	<5		<0.1		13		5		85		2	63	34	2.71	<5
56.24	6952	Hattie	R	SC	8.5@.5	UW	Alt volc adjacent to shear, minor py	<5		<0.1		41		3		95		1	57	41	1.46	<5
56.25	6955	Hattie	R	C	5.2	UW	Intrusive and sheared, fest, alt volc	6		<0.1		9		3		112		2	94	42	2.29	<5
56.26	2635	Hattie	R	G		RC	Qz vn	<5		<0.2		11		<1		32		<1	11	5	0.18	<2
57.1	499	Independence	R	Rep	2	RC	Qz vn	<5		<0.1		8		<2		2		4	19	1	0.03	<5
57.2	501	Independence	R	Rep	1.3	RC	Qz vn	<5		<0.1		11		5		2		3	16	1	0.03	<5
57.3	500	Independence	R	C	1.1	RC	Qz vn	<5		0.2		88		27		4		2	12	5	0.06	<5
57.3	8743	Independence	R	C	2.4	OC	Msv qz vn w/ <1% mg, cubic py	94		0.2		44		14		28		4	18	7	0.09	<5
57.3	8744	Independence	R	C	4.5	OC	Msv qz vn	74		5.2		139		4236		17		<1	8	5	0.04	<5
57.4	498	Independence	R	G		MD	Qz vn	<5		<0.1		74		9		19		4	18	8	0.39	<5
57.4	8742	Independence	R	C	2.8	OC	Msv qz vn in gray sc	<5		<0.1		7		<2		13		2	6	<1	0.04	<5
57.5	497	Independence	R	G		FL	Qz vn	<5		<0.1		23		<2		9		4	18	3	0.32	<5
58.1	9570	Mad Dog 2	R	C	0.7	OC	Weathered gs w/ msv banded sulf	676		16.6		322		115		7481		<1	2	11	0.03	160
58.1	9702	Mad Dog 2	R	S		MD	Sil msv sulf	2867		27.1		1512		79		2.90	*	2	5	49	0.03	92
58.2	350	Mad Dog 2	R	C	0.4	OC	Qz-cc vn w/ sulf	14		<0.1		3		32		138		4	4	4	0.44	5
58.3	349	Mad Dog 2	R	G	0.3	FL	Sil, fest zone w/ py	105		1.3		50		24		317		13	49	20	0.57	103
58.4	344	Mad Dog 2	R	C	0.8	TP	Fest sc	151		2.5		240		76		732		2	17	31	1.55	43
58.4	345	Mad Dog 2	R	C	0.9	TP	Fest sc	172		2.4		310		118		1120		<1	24	37	1.93	45
58.4	346	Mad Dog 2	R	C	0.6	TP	Sil, fest sc & msv py	1046		21.7		395		112		1.00	*	2	6	16	0.06	133
58.4	347	Mad Dog 2	R	C	0.3	TP	Gray sc w/ wisps of py	67		2.9		310		75		1875		2	42	39	2.86	45
58.5	348	Mad Dog 2	R	SS				10		0.3		27		33		314		1	65	344	1.09	42
59.1	9638	Brushy Creek	R	C	0.1	OC	Banded metaseds w/ banded py	<5		0.3		160		25		99		3	23	21	3.18	33
59.2	195	Brushy Creek	R	C	2	OC	Sil gs w/ dissem & banded py, sl	423		27.9		166		7380		2.60	*	7	31	20	1.39	600
59.3	193	Brushy Creek	R	SC	10@.25	OC	Gray sil sc w/ py	16		1.3		196		131		588		2	44	29	3.81	30
59.3	194	Brushy Creek	R	C	0.07	OC	Sil band w/ py, sl, trace gn in gray sc	44		10.5		142		3236		1.29	*	5	32	27	0.48	30
59.3	9636	Brushy Creek	R	S		RC	Thinly bedded metaseds w/ banded py, gn, sl	81		33.9		79		9824		8491		4	35	26	0.60	37
59.3	9637	Brushy Creek	R	SC	15@.25	OC	Thinly bedded metaseds & sil sc, w/ sl, gn, py	68		3.3		195		289		4904		2	44	33	3.29	76
59.4	192	Brushy Creek	R	SC	4.7@.25	OC	Fest, calc volc w/ py, trace fg sl	33		1.2		111		117		1735		<1	30	25	3.75	83
59.5	190	Brushy Creek	R	Rep	3	OC	Calc volc w/ bands of py, sl	151		5.4		289		184		2.20	*	2	42	28	4.71	99
59.5	191	Brushy Creek	R	SC	4@.25	OC	Calc volc w/ bands of py, sl	96		6.1		258		794		1.56	*	2	37	27	3.56	148
60.1	691	Olympic Resources Gold	R	G	0.3	OC	Gs	8		<0.1		146		4		76		2	41	31	2.54	18
60.1	692	Olympic Resources Gold	SS					<5		<0.2		27		6		53		<1	12	33	1.94	74
60.2	690	Olympic Resources Gold	S					22		<0.2		15		29		18		<1	3	5	0.45	10
60.3	800	Olympic Resources Gold	R	G		OC	Gs	<5		<0.1		166		3		105		3	66	43	4.39	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
56.8	714	Hattie	206	*	<5	3.27	0.7	2	>10	<2	0.782	0.01	4	2.20	1694	<0.01	56	<5	46	<4	*	48	<10	<0.01	595	10	*		
56.9	9715	Hattie	101	*	<5	0.06	<0.2	520	1.31	<2	0.398	<0.01	<1	0.01	201	<0.01	<1	<5	<5	4	*	1	<10	<0.01	12	<20			
56.10	713	Hattie	101	*	<5	0.14	<0.2	95	0.41	<2	<0.01	0.01	<1	0.02	76	<0.01	<1	<5	<5	<4	*	3	<10	<0.01	10	8	*		
56.11	520	Hattie	238	*	<5	0.77	<0.2	324	1.43	<2	0.459	0.06	<1	0.17	287	<0.01	1	<5	<5	2	*	12	<10	<0.01	19	<20			
56.12	712	Hattie	67	*	<5	0.46	<0.2	102	1.45	<2	0.132	<0.01	<1	0.13	240	<0.01	7	<5	7	<4	*	7	<10	<0.01	86	8	*		
56.13	519	Hattie	95	*	<5	0.75	<0.2	368	1.06	<2	0.339	0.05	<1	0.27	195	<0.01	<1	<5	<5	4	*	27	<10	<0.01	16	<20			
56.14	6956	Hattie	730	*	<5	>10	<0.2	148	3.12	<2	0.066	0.25	3	2.28	1460	<0.01	4	<5	17	<4	*	516	<10	<0.01	59	6	*		
56.15	2630	Hattie	40		<2	<.01	1.5	291	0.63	<10	0.350	<.01	<10	<.01	35	<.01		<2	1			<1		<.01	16	<10			
56.16	2631	Hattie	30		<2	<.01	0.5	370	1.04	<10	1.120	0.01	<10	<.01	45	<.01		2	1			<1		<.01	19	<10			
56.17	2634	Hattie	10		<2	<.01	<.5	324	1.85	<10	2.360	<.01	<10	0.01	75	<.01		<2	3			<1		<.01	27	<10			
56.18	2632	Hattie	30		<2	<.01	<.5	261	0.84	<10	0.120	<.01	<10	0.01	50	<.01		<2	1			<1		<.01	17	<10			
56.19	2633	Hattie	40		<2	<.01	<.5	433	0.97	<10	0.230	0.05	<10	0.01	50	<.01		<2	1			<1		<.01	18	<10			
56.20	6950	Hattie	151	*	<5	1.07	<0.2	204	0.80	<2	0.232	0.05	1	0.32	175	<0.01	1	<5	<5	<4	*	24	<10	<0.01	14	6	*		
56.21	6951	Hattie	414	*	<5	5.31	<0.2	80	3.98	<2	0.770	0.11	3	1.72	1023	<0.01	5	<5	17	<4	*	117	<10	<0.01	70	8	*		
56.22	6953	Hattie	684	*	<5	8.31	<0.2	229	4.13	<2	0.155	0.28	2	3.99	1064	0.01	4	<5	15	<4	*	147	<10	<0.01	73	6	*		
56.23	6954	Hattie	658	*	<5	8.19	<0.2	113	6.03	<2	0.368	0.32	4	3.33	1325	0.01	11	<5	19	<4	*	154	<10	<0.01	134	9	*		
56.24	6952	Hattie	470	*	<5	6.69	<0.2	52	7.36	<2	0.222	0.11	4	3.29	1437	0.01	13	<5	26	<4	*	226	<10	<0.01	154	9	*		
56.25	6955	Hattie	1193	*	<5	6.07	<0.2	106	7.55	<2	0.150	0.41	5	2.93	1225	0.01	8	<5	17	<4	*	186	<10	<0.01	112	10	*		
56.26	2635	Hattie	10		<2	<.01	<.5	341	3.88	<10	0.640	<.01	<10	0.03	320	<.01		<2	12			<1		<.01	91	<10			
57.1	499	Independence	143	*	<5	0.01	<0.2	426	0.45	<2	0.096	0.02	<1	<0.01	204	<0.01	<1	<5	<5	4	*	<1	<10	<0.01	4	<20			
57.2	501	Independence	131	*	<5	<0.01	<0.2	334	0.42	<2	0.190	0.02	<1	<0.01	81	<0.01	<1	<5	<5	3	*	<1	<10	<0.01	5	<20			
57.3	500	Independence	133	*	<5	0.02	<0.2	345	0.76	<2	0.171	0.01	<1	0.01	103	<0.01	<1	<5	<5	2	*	<1	<10	<0.01	7	<20			
57.3	8743	Independence	338	*	<5	0.06	<0.2	410	1.10	<2	0.080	0.03	<1	0.02	493	<0.01	<1	<5	<5	4	*	1	<10	<0.01	11	<20			
57.3	8744	Independence	88	*	6	0.16	2.8	323	0.67	<2	7.696	0.01	<1	0.05	140	<0.01	<1	<5	<5	<1	*	2	20	<0.01	5	<20			
57.4	498	Independence	1167	*	<5	1.34	<0.2	270	1.93	<2	0.469	0.11	2	0.47	407	<0.01	1	<5	<5	4	*	19	<10	<0.01	23	<20			
57.4	8742	Independence	179	*	<5	0.02	<0.2	338	0.43	<2	0.025	0.02	<1	<0.01	39	<0.01	<1	<5	<5	2	*	<1	<10	<0.01	4	<20			
57.5	497	Independence	5962	*	<5	0.05	<0.2	341	1.08	<2	0.012	<0.01	<1	0.28	264	0.01	1	<5	<5	4	*	17	<10	0.03	22	<20			
58.1	9570	Mad Dog 2	3		6	0.02	37.8	66	10.54	<2	<0.01	0.02	<1	<0.01	34	<0.01	<1	10	<5	<20		20	<10	0.02	2	<20			
58.1	9702	Mad Dog 2	<1		9	0.02	144.6	54	23.21	<2	3.088	0.03	<1	<0.01	51	<0.01	<1	7	<5	<20		5	11	0.02	<1	<20			
58.2	350	Mad Dog 2	415	*	8	>10	0.4	8	2.97	<2	1.599	<0.01	5	1.32	2959	<0.01	<1	<5	12	<20		355	<10	<0.01	49	<20			
58.3	349	Mad Dog 2	3345	*	<5	0.03	1.0	98	6.81	<2	1.036	0.15	<1	0.11	492	<0.01	<1	35	6	<20		5	<10	<0.01	29	<20			
58.4	344	Mad Dog 2	**10.32%**	*	<5	0.05	1.0	77	7.56	<2	1.600	0.41	2	0.48	2043	<0.01	2	<5	9	<20		86	<10	0.41	128	<20			
58.4	345	Mad Dog 2	**5.63%**	*	<5	0.04	1.1	96	>10	<2	0.543	0.50	2	0.68	2441	0.01	2	<5	11	<20		32	<10	0.42	158	<20			
58.4	346	Mad Dog 2	**27.25%**	*	<5	<0.01	45.1	52	>10	<2	2.809	0.02	<1	<0.01	62	<0.01	<1	8	<5	<20		8	<10	0.03	7	<20			
58.4	347	Mad Dog 2	**2.98%**	*	<5	2.88	7.9	108	9.17	<2	0.202	2.22	<1	1.88	4826	0.03	2	<5	11	<20		47	<10	0.54	254	<20			
58.5	348	Mad Dog 2	2113	*	<5	0.66	1.0	48	16.74	<2	0.272	0.04	11	0.27	7	0.03	5	<5	5	<20		57	<10	0.02	60	<20			
59.1	9638	Brushy Creek	563	*	<5	8.11	0.4	68	7.64	8	0.090	0.05	5	2.12	1626	<0.01	1	<5	13	<20		282	<10	<0.01	140	<20			
59.2	195	Brushy Creek	297	*	<5	0.71	87.1	79	9.21	9	4.241	0.05	2	1.50	2217	<0.01	<1	68	12	<20		9	12	<0.01	36	24			
59.3	193	Brushy Creek	1078	*	<5	7.10	1.8	58	7.71	10	0.048	0.16	<1	2.17	2371	<0.01	<1	20	13	<20		73	<10	<0.01	154	<20			
59.3	194	Brushy Creek	200	*	<5	25.20	46.3	16	3.72	<2	1.521	0.09	<1	0.33	3327	<0.01	3	56	6	<20		173	<10	<0.01	21	<20			
59.3	9636	Brushy Creek	247	*	<5	23.82	29.7	15	3.80	<2	0.685	0.11	1	0.38	3188	<0.01	3	59	6	<20		134	<10	<0.01	22	<20			
59.3	9637	Brushy Creek	1362	*	<5	6.71	19.4	64	8.02	8	0.389	0.14	3	2.23	1869	0.02	1	63	13	<20		95	<10	<0.01	135	<20			
59.4	192	Brushy Creek	1869	*	<5	2.40	7.6	77	6.28	9	0.172	0.10	<1	3.59	1662	<0.01	<1	13	16	<20		39	<10	<0.01	174	<20			
59.5	190	Brushy Creek	3734	*	<5	4.29	81.3	80	8.73	12	0.756	0.09	<1	2.94	1628	<0.01	<1	18	22	<20		54	<10	<0.01	259	<20			
59.5	191	Brushy Creek	5014	*	<5	6.11	73.4	66	9.10	10	0.500	0.12	<1	2.68	1684	<0.01	<1	18	19	<20		118	<10	<0.01	194	<20			
60.1	691	Olympic Resources Gold	294	*	<5	1.16	0.3	71	5.71	6	0.015	0.16	2	1.51	1287	0.04	12	<5	6	<4	*	18	<10	0.75	165	9	*		
60.1	692	Olympic Resources Gold	425	*	<5	0.60	<0.2	29	5.82	2		0.04	6	0.64	2343	0.02	11	<5	<5	<20		21	<10	0.14	121	<20			
60.2	690	Olympic Resources Gold	418	*	<5	0.10	<0.2	14	0.38	<2		0.02	3	0.04	82	0.02	7	<5	<5	<20		4	<10	0.25	41	<20			
60.3	800	Olympic Resources Gold	241	*	<5	1.08	0.4	93	8.68	12	0.048	0.03	3	2.95	1286	0.03	24	<5	21	<4	*	16	<10	0.49	293	7	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
60.4	693	Olympic Resources Gold	S					293		<0.2		18		4		25		<1	11	11	1.17	<5
60.5	681	Olympic Resources Gold	S					10		<0.1		45		12		39		1	8	15	4.03	<5
60.5	683	Olympic Resources Gold	R	G	1	OC	Gs w/ sparse py	6		<0.1		204		4		84		<1	38	35	2.47	<5
60.5	762	Olympic Resources Gold	R	Rep	2	OC	Gray-green metavolcanics	<5		<0.1		109		5		127		3	42	28	3.49	5
60.6	658	Olympic Resources Gold	S					<5		<0.1		97		9		81		<1	29	17	2.13	67
60.7	671	Olympic Resources Gold	S					14		<0.1		4		10		8		<1	2	6	0.45	5
60.8	670	Olympic Resources Gold	S					10		<0.1		71		8		85		<1	35	17	3.56	14
60.9	669	Olympic Resources Gold	S					9		<0.1		38		6		56		<1	25	12	2.26	18
60.10	694	Olympic Resources Gold	S					94		<0.2		111		8		60		<1	14	19	1.78	458
60.11	667	Olympic Resources Gold	S					29		<0.1		62		8		54		<1	25	22	2.58	49
60.11	668	Olympic Resources Gold	S					11		0.1		110		7		76		1	29	26	2.72	27
60.12	666	Olympic Resources Gold	S					16		<0.1		23		10		33		<1	9	13	1.14	<5
60.13	659	Olympic Resources Gold	S					17		<0.1		232		7		144		<1	75	43	3.58	26
60.13	660	Olympic Resources Gold	S					7		<0.1		172		5		145		<1	71	37	3.58	108
60.13	682	Olympic Resources Gold	SS					10		<0.2		50		21		105		<1	21	46	2.83	491
60.13	695	Olympic Resources Gold	SS					44		<0.2		154		6		109		<1	55	34	2.68	138
60.13	696	Olympic Resources Gold	R	G	0.5	TP	Sil gs w/ py	12		0.3		265		5		140		2	77	55	4.05	39
60.13	697	Olympic Resources Gold	S					8		<0.2		299		6		185		<1	99	47	2.52	105
60.13	801	Olympic Resources Gold	R	G		FL	Qz vn	<5		<0.1		17		3		17		<1	14	6	0.81	29
60.13	802	Olympic Resources Gold	R	G		OC	Sil gs w/ py	730		0.3		19		5		22		<1	13	13	0.49	>10000
60.13	854	Olympic Resources Gold	R	Rep	4	RC	Sil, gray volc	94		0.3		70		5		77		<1	14	21	1.57	1374
60.14	675	Olympic Resources Gold	S					6		<0.1		122		7		92		<1	31	21	2.68	13
60.14	676	Olympic Resources Gold	S					10		<0.1		50		8		47		2	13	13	5.01	9
60.15	677	Olympic Resources Gold	S					9		<0.1		87		5		45		<1	25	24	1.99	<5
60.16	678	Olympic Resources Gold	S					16		<0.1		162		8		138		3	51	56	5.45	78
60.16	679	Olympic Resources Gold	S					9		<0.1		117		8		145		2	26	32	5.51	61
60.17	680	Olympic Resources Gold	S					30		<0.1		5		8		6		<1	1	4	0.19	<5
60.18	661	Olympic Resources Gold	S					13		<0.1		72		5		173		<1	63	29	0.83	204
60.18	662	Olympic Resources Gold	S					15		<0.1		144		6		152		<1	59	32	1.08	329
60.18	672	Olympic Resources Gold	PC		1 pan			<5		<0.1		166		5		119		2	64	32	3.70	63
60.18	673	Olympic Resources Gold	R	G	0.4	RC	Sil, bleached gs w/ 5% dissem py	<5		<0.1		237		6		145		<1	85	49	2.11	25
60.18	674	Olympic Resources Gold	R	G	0.4	OC	Gs w/ 10% dissem py	6		<0.1		231		5		119		2	59	46	4.39	26
60.19	663	Olympic Resources Gold	S					10		<0.1		107		6		156		<1	52	39	5.48	78
60.19	664	Olympic Resources Gold	S					67		0.1		114		8		98		2	30	28	4.57	122
60.19	698	Olympic Resources Gold	R	G	0.5	OC	Gs	11		<0.1		192		4		85		2	52	28	2.68	16
60.19	763	Olympic Resources Gold	S					11		<0.2		313		3		124		1	67	47	4.38	97
60.19	803	Olympic Resources Gold	SS					6		<0.2		48		7		96		<1	23	58	2.80	247
60.20	665	Olympic Resources Gold	S					74		0.2		107		8		103		<1	31	28	2.71	123
60.21	699	Olympic Resources Gold	SS					11		<0.2		71		7		116		<1	33	47	3.43	237
60.21	804	Olympic Resources Gold	R	G		FL	White qz	<5		<0.1		3		<2		3		4	5	1	0.05	44
60.22	855	Olympic Resources Gold	S					7		<0.2		21		4		17		<1	6	10	0.89	<5
60.23	700	Olympic Resources Gold	SS					8		<0.2		71		9		130		<1	35	77	3.05	221
60.24	805	Olympic Resources Gold	SS					15		<0.2		54		7		97		<1	29	45	2.94	237
60.25	764	Olympic Resources Gold	R	G	0.5	FL	Fest qz	<5		<0.1		9		<2		8		<1	5	4	0.05	<5
60.26	765	Olympic Resources Gold	SS					12		<0.2		64		6		108		2	30	39	2.61	158
60.27	767	Olympic Resources Gold	R	C	0.4	OC	Qz-cc vn	<5		<0.1		2		3		37		4	17	9	1.58	<5
60.28	766	Olympic Resources Gold	R	G	0.5	OC	Fest sil volc	<5		<0.1		102		5		57		5	33	23	0.60	16
60.29	856	Olympic Resources Gold	R	S		OC	Gray-green metavolc	<5		<0.1		11		<2		14		3	9	5	0.35	6
60.30	857	Olympic Resources Gold	R	S	0.5	OC	Sil metavolc	22		0.2		114		3		53		3	26	15	0.43	77

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
60.4	693	Olympic Resources Gold	581	*	<5	0.31	<0.2	30	4.04	<2		0.12	3	0.40	235	0.02	14	<5	<5	<20		15	<10	0.37	153	<20			
60.5	681	Olympic Resources Gold	322	*	<5	0.12	0.4	61	5.51	6	0.164	0.05	6	0.33	162	0.02	21	<5	8	<4	*	11	<10	0.59	173	6	*		
60.5	683	Olympic Resources Gold	254	*	<5	1.66	0.4	62	5.29	<2	0.015	<0.01	2	1.70	1014	0.06	9	<5	<5	<4	*	22	<10	0.57	136	<4	*		
60.5	762	Olympic Resources Gold	611	*	<5	1.08	0.5	70	7.05	6	0.022	<0.01	<1	2.27	1200	0.02	11	<5	<5	<4	*	17	<10	0.68	150	9	*		
60.6	658	Olympic Resources Gold	503	*	<5	0.55	0.2	33	3.76	5	0.100	0.04	7	0.71	412	0.01	11	15	10	<4	*	14	<10	0.19	132	5	*		
60.7	671	Olympic Resources Gold	618	*	<5	0.09	<0.2	8	0.70	2	0.058	0.03	3	0.05	63	<0.01	9	<5	<5	<4	*	7	<10	0.26	67	5	*		
60.8	670	Olympic Resources Gold	828	*	<5	0.72	0.4	45	2.99	4	0.112	0.11	12	0.68	409	0.02	8	<5	8	<4	*	29	<10	0.17	73	<4	*		
60.9	669	Olympic Resources Gold	858	*	<5	0.53	<0.2	36	2.22	3	0.060	0.09	12	0.57	262	0.03	7	<5	6	<4	*	26	<10	0.15	66	<4	*		
60.10	694	Olympic Resources Gold	476	*	<5	0.44	0.9	16	7.46	4		0.11	13	0.19	920	0.02	11	14	10	<20		16	<10	<0.01	122	<20			
60.11	667	Olympic Resources Gold	536	*	<5	0.30	0.3	35	4.77	6	0.167	0.04	6	0.86	920	0.01	8	<5	6	<4	*	13	<10	0.22	92	<4	*		
60.11	668	Olympic Resources Gold	601	*	<5	0.38	0.5	51	9.08	8	0.128	0.03	4	1.25	954	0.01	12	<5	9	<4	*	15	<10	0.22	161	<4	*		
60.12	666	Olympic Resources Gold	484	*	<5	0.26	<0.2	26	2.20	3	0.127	0.03	4	0.32	516	0.01	11	<5	<5	<4	*	14	<10	0.37	117	<4	*		
60.13	659	Olympic Resources Gold	464	*	<5	0.54	0.6	150	7.68	10	0.052	0.09	7	2.16	765	0.01	17	<5	25	<4	*	14	<10	0.25	235	<4	*		
60.13	660	Olympic Resources Gold	145	*	<5	0.29	0.6	169	>10	18	0.055	0.03	6	2.06	804	<0.01	26	6	31	<4	*	9	<10	0.05	340	<4	*		
60.13	682	Olympic Resources Gold	344	*	<5	0.61	1.1	37	>10	3		0.03	6	0.80	6526	0.02	14	<5	6	<20		25	<10	0.06	187	<20			
60.13	695	Olympic Resources Gold	457	*	<5	0.37	0.4	77	8.54	4		0.05	6	0.90	1909	0.02	16	6	16	<20		15	<10	0.06	199	<20			
60.13	696	Olympic Resources Gold	238	*	<5	1.40	0.6	74	9.08	5	0.018	0.11	7	2.72	1901	0.01	19	5	24	7	*	17	<10	<0.01	238	10	*		
60.13	697	Olympic Resources Gold	819	*	<5	0.37	0.3	130	9.74	6		0.12	6	0.94	1140	0.01	21	15	33	<20		14	<10	0.01	254	<20			
60.13	801	Olympic Resources Gold	64	*	<5	0.06	<0.2	182	2.36	3	0.016	0.01	<1	0.50	250	<0.01	4	<5	<5	4	*	<1	<10	<0.01	62	8	*		
60.13	802	Olympic Resources Gold	273	*	<5	0.42	1.9	63	2.97	<2	<0.01	0.12	4	0.23	214	<0.01	<1	210	<5	<4	*	7	<10	<0.01	28	11	*		
60.13	854	Olympic Resources Gold	423	*	<5	0.77	0.2	17	4.27	<2	0.037	0.22	9	0.96	525	<0.01	4	13	<5	<4	*	14	<10	<0.01	81	9	*		
60.14	675	Olympic Resources Gold	558	*	<5	0.57	<0.2	52	2.96	3	0.056	0.08	7	1.03	467	0.02	7	<5	5	<4	*	21	<10	0.20	92	<4	*		
60.14	676	Olympic Resources Gold	321	*	<5	0.30	<0.2	37	1.85	4	0.145	0.04	11	0.37	176	0.02	13	<5	8	<4	*	14	<10	0.32	107	7	*		
60.15	677	Olympic Resources Gold	332	*	<5	0.61	0.2	81	2.61	<2	0.083	0.08	3	0.81	341	0.01	12	<5	7	<4	*	16	<10	0.56	125	5	*		
60.16	678	Olympic Resources Gold	296	*	<5	0.26	0.4	105	9.67	16	0.356	0.05	11	1.30	3834	0.02	17	<5	19	<4	*	12	<10	0.17	228	<4	*		
60.16	679	Olympic Resources Gold	278	*	<5	0.99	0.3	28	5.62	4	0.156	0.07	8	1.02	1043	0.05	8	<5	9	<4	*	32	<10	0.27	110	<4	*		
60.17	680	Olympic Resources Gold	404	*	<5	0.04	<0.2	7	0.20	<2	0.055	0.02	4	0.03	36	<0.01	5	<5	<5	<4	*	3	<10	0.19	45	<4	*		
60.18	661	Olympic Resources Gold	361	*	<5	0.60	0.4	75	5.15	7	0.049	0.16	12	0.13	303	<0.01	10	82	18	<4	*	13	<10	<0.01	127	<4	*		
60.18	662	Olympic Resources Gold	551	*	<5	0.49	0.5	72	9.83	9	0.050	0.12	12	0.13	473	<0.01	12	71	26	<4	*	14	<10	<0.01	167	6	*		
60.18	672	Olympic Resources Gold	462	*	<5	0.28	<0.2	137	7.09	5	0.024	0.32	4	0.45	562	0.02	18	8	23	<4	*	11	<10	0.05	274	<4	*		
60.18	673	Olympic Resources Gold	358	*	<5	0.65	0.6	104	>10	10	0.044	0.11	5	1.47	1344	0.01	19	14	30	<4	*	19	<10	0.11	254	<4	*		
60.18	674	Olympic Resources Gold	1023	*	<5	0.35	0.6	93	>10	14	0.064	0.07	5	2.51	1626	0.03	21	<5	27	<4	*	11	<10	0.20	283	<4	*		
60.19	663	Olympic Resources Gold	469	*	<5	0.25	0.5	70	>10	18	0.108	0.07	5	2.24	2215	0.01	15	5	12	<4	*	9	<10	0.02	217	<4	*		
60.19	664	Olympic Resources Gold	381	*	<5	0.30	0.4	62	8.31	14	0.235	0.05	9	1.12	767	0.01	16	6	12	<4	*	12	<10	0.12	215	<4	*		
60.19	698	Olympic Resources Gold	905	*	<5	1.30	0.5	90	4.92	6	0.011	0.13	4	2.02	867	0.03	10	<5	7	<4	*	29	<10	0.45	139	9	*		
60.19	763	Olympic Resources Gold	300	*	<5	0.71	0.5	160	8.21	<2		0.03	9	1.72	1383	0.02	10	<5	18	<20		16	<10	0.16	146	<20			
60.19	803	Olympic Resources Gold	498	*	<5	0.80	0.6	34	>10	<2		0.03	8	0.59	11398	0.02	10	<5	<5	<20		30	<10	0.10	125	<20			
60.20	665	Olympic Resources Gold	456	*	<5	0.37	0.2	42	5.20	7	0.141	0.05	9	0.74	2259	0.02	7	8	9	<4	*	16	<10	0.18	100	<4	*		
60.21	699	Olympic Resources Gold	495	*	<5	0.48	0.5	55	>10	3		0.03	5	1.39	5528	0.02	13	<5	7	<20		18	<10	0.10	179	<20			
60.21	804	Olympic Resources Gold	48	*	<5	0.02	<0.2	114	0.23	<2	<0.01	<0.01	<1	0.02	113	<0.01	<1	<5	<5	5	*	<1	<10	<0.01	6	7	*		
60.22	855	Olympic Resources Gold	199	*	<5	0.21	<0.2	20	2.22	<2		<0.01	2	0.27	144	0.02	13	<5	<5	<20		10	<10	0.37	136	<20			
60.23	700	Olympic Resources Gold	622	*	<5	0.80	0.7	38	>10	<2		0.04	7	0.93	12619	0.02	11	<5	5	<20		28	<10	0.10	139	<20			
60.24	805	Olympic Resources Gold	368	*	<5	0.55	0.5	51	>10	4		0.03	5	1.19	5130	0.02	13	<5	7	<20		19	<10	0.08	169	<20			
60.25	764	Olympic Resources Gold	84	*	<5	0.04	<0.2	99	0.37	<2	<0.01	<0.01	<1	0.02	651	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	3	8	*		
60.26	765	Olympic Resources Gold	661	*	<5	0.77	0.5	36	8.09	2		0.04	7	0.93	6733	0.02	10	<5	5	<20		25	<10	0.08	120	<20			
60.27	767	Olympic Resources Gold	27	*	<5	7.95	0.4	54	2.87	2	<0.01	<0.01	2	1.47	776	<0.01	4	<5	7	<4	*	211	<10	<0.01	65	7	*		
60.28	766	Olympic Resources Gold	162	*	<5	>10	0.3	49	5.98	<2	0.018	0.08	3	5.13	1525	0.03	8	6	12	<4	*	195	<10	<0.01	105	9	*		
60.29	856	Olympic Resources Gold	49	*	<5	7.26	<0.2	96	1.24	<2	0.018	0.02	<1	0.60	766	0.02	<1	<5	<5	<4	*	101	<10	<0.01	22	7	*		
60.30	857	Olympic Resources Gold	272	*	<5	5.06	<0.2	53	3.56	<2	0.027	0.13	2	1.10	951	0.03	2	14	6	<4	*	67	<10	<0.01	56	10	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
61.1	399	Freel & Durham	SS					15		<0.1		14		3		55		<1	33	6	0.91	<5
61.1	400	Freel & Durham	R	G		FL	Qz vn	<5		<0.1		13		<2		7		3	10	1	0.10	<5
61.1	2815	Freel & Durham	SS					9		<0.1		23		11		93		<1	64	13	1.68	<5
61.1	2816	Freel & Durham	SS					<5		<0.1		22		8		79		<1	52	12	1.32	5
61.1	2817	Freel & Durham	R	G		FL	Qz	13		<0.1		6		<2		4		<1	6	1	0.10	<5
61.1	2818	Freel & Durham	R	G		FL	Qz	<5		<0.1		8		4		13		<1	11	2	0.17	<5
62.1	401	Road Show	R	PC				10		0.3		8		3		24		<1	9	4	0.73	<5
62.1	402	Road Show	R	G		FL	Qz vn fragments	<5		<0.1		16		<2		4		2	8	<1	0.08	<5
62.1	2819	Road Show	R	SS				<5		<0.1		28		12		90		<1	20	8	1.45	5
62.1	2820	Road Show	R	SS				<5		<0.1		19		14		60		<1	19	9	1.37	<5
63.1	3914	December Point	R	SC	6@.5	OC	Fractured tonalite w/ py, stibnite(?)	<5		<0.1		9		13		51		<1	4	4	0.52	15
63.1	3915	December Point	R	SC	12@.5	OC	Tonalite w/ minor py & stibnite(?)	<5		<0.1		9		8		35		2	4	4	0.28	76
63.1	3916	December Point	R	S		RC	Sil tonalite w/ stibnite(?)	<5		<0.1		6		10		68		3	8	3	0.30	1420
63.1	8797	December Point	R	SC	21@1	TP	Tonalite	<5		<0.1		10		7		53		2	7	3	0.39	468
63.1	8798	December Point	R	SC	15@1	TP	Tonalite	<5		<0.1		5		6		35		2	5	3	0.46	131
63.1	8799	December Point	R	S		TP	Tonalite	<5		<0.1		3		6		19		2	5	1	0.43	152
64.1	391	Mitkof Island, FS Rd 6245	R	G	0.2	TP	Msv, fest po w/ hbl	18		6.8		1007		303		395		4	81	100	1.21	9
65.1	291	Zarembo Is., FS Rd 52009	R	G	0.2	FL	Purple & green fluorite	18		<0.1		21		5		20		7	2	2	1.17	40
65.1	9651	Zarembo Is., FS Rd 52009	R	G		FL	Sil metaseds w/ narrow lens of msv py	546		3.1		15		20		40		3	5	21	0.68	826
66.1	307	Frenchie	R	C	1.8	OC	Banded chert w/ sulf	18		1.0		126		944		2340		3	4	<1	1.26	38
66.1	308	Frenchie	R	C	4.6	OC	Sil zone w/ banded sulf	488		15.0		3830		638		2.08	*	32	8	7	0.07	339
66.2	2617	Frenchie	R	SC	6@.5	OC	Msv sulf	295		9.3		1300		1800		2.38	*	20	7	3	0.81	1010
66.3	18	Frenchie	R	C	5	OC	Sil sulf band w/ sl & py	260		7.8		1619		3213		4.90	*	20	9	<1	0.35	952
66.4	9660	Frenchie	R	C	2	OC	Banded, sil volc w/ py, sl at fault margin	28		2.5		75		3973		1.51	*	9	5	<1	0.60	87
66.4	9661	Frenchie	R	C	0.3	OC	Black slate in banded volc w/ sulf bands	26		0.7		131		933		708		4	26	2	2.49	90
66.4	9662	Frenchie	R	C	3.7	OC	Sil, banded volc w/ banded py, sl	495		10.1		1472		3029		3.66	*	24	7	3	0.21	2406
66.5	2616	Frenchie	R	C	5	OC	Fg msv sulf w/ carb & silica	835		11.3		2300		600		1.40	*	40	8	2	0.39	488
66.6	17	Frenchie	R	C	5.5	UW	Sil sulf band w/ sl & py	1204		12.1		5453		1736		3.50	*	29	7	<1	0.12	468
66.7	303	Frenchie	R	C	1.1	OC	Banded chert w/ bands of fg sl, py	26		2.3		47		1250		1037		8	8	<1	1.02	170
66.7	304	Frenchie	R	C	0.8	OC	Gp phy	28		<0.1		281		1732		6971		4	32	<1	2.09	11
66.7	305	Frenchie	R	C	4.7	OC	Sil zone w/ banded sulf	972		16.1		1214		1144		1923		50	7	2	0.08	582
66.7	306	Frenchie	R	Rep	1	OC	Qz-muscovite sc	13		<0.1		73		23		175		<1	3	<1	1.42	<5
66.8	207	Frenchie	R	C	5.5	OC	Py	729		8.5		2600		805		9882		29	13	<1	0.53	290
67.1	15	Lost Zarembo	R	C	0.8	OC	Fest sil sulf band w/ sl & py	89		14.8		1215		1960		4.00	*	4	13	26	0.30	<5
67.1	16	Lost Zarembo	R	C	1	OC	Sil fest sulf band	108		22.1		3529		2856		3.70	*	36	26	27	2.08	10
67.1	314	Lost Zarembo	R	C	2	TP	Andesite	<5		0.5		7		113		813		2	38	33	4.35	11
67.1	315	Lost Zarembo	R	C	1	TP	Sil, banded gs	17		1.2		167		384		1827		27	4	<1	2.22	6
67.1	316	Lost Zarembo	R	C	0.4	TP	Discontinuous band of fest, sil gs w/ sulf	38		8.9		1867		2225		2.00	*	20	11	4	4.44	<5
67.1	317	Lost Zarembo	R	C	1.2	TP	Sil, fest gs w/ sulf	37		0.4		66		135		2038		3	4	<1	2.96	<5
67.1	318	Lost Zarembo	R	C	0.8	TP	Fest, sil gs w/ sulf	58		27.6		3781		3657		4.55	*	44	33	36	1.68	13
67.1	319	Lost Zarembo	R	C	3	TP	Sil, banded gs w/ sulf	9		0.2		29		33		331		<1	2	<1	1.69	<5
67.1	320	Lost Zarembo	R	C	1.6	TP	Sil, fest, fg rock w/ sulf	108		14.3		1204		1388		3.52	*	4	15	28	0.13	<5
67.1	321	Lost Zarembo	R	C	2.6	TP	Sil, fest, fg rock w/ sulf	131		8.3		966		818		1.86	*	8	15	22	0.93	6
67.1	322	Lost Zarembo	R	C	0.7	TP	Sil, banded gs	8		<0.1		15		16		220		2	5	3	2.72	<5
67.1	2625	Lost Zarembo	R	G	0.4	OC	Sil msv sulf w/ sl, py, cp	180		16.7		870		3000		5.50	*	9	18	44	0.21	10
67.1	9658	Lost Zarembo	R	Rep		TP	Fest rhyolite	7		<0.1		21		12		74		10	2	<1	0.37	7
67.1	9667	Lost Zarembo	R	Rep		RC	Sil, banded, msv sulf in sil volc host	151		13.6		866		2817		4.92	*	7	11	25	0.14	8
67.1	9668	Lost Zarembo	R	RC		OC	Fest rhyolite	10		0.2		24		12		147		10	2	<1	0.23	<5
67.1	9669	Lost Zarembo	R	Rep	1	TP	Very thinly banded, sil volc	6		<0.1		9		8		119		<1	3	<1	2.32	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
61.1	399	Freel & Durham	612		<5	0.24	<0.2	46	1.68	<2	<0.01	0.05	7	0.63	209	0.01	<1	<5	<5	<20		17	<10	0.05	31	<20		20	14
61.1	400	Freel & Durham	57	*	<5	0.04	<0.2	358	0.49	<2	<0.01	0.02	<1	0.03	75	0.02	<1	<5	<5	<20		7	<10	<0.01	4	<20			
61.1	2815	Freel & Durham	729	*	<5	0.30	<0.2	92	2.85	3	0.025	0.12	8	1.12	376	0.04	<1	<5	<5	<20		21	<10	0.07	47	<20			
61.1	2816	Freel & Durham	689	*	<5	0.26	<0.2	64	2.58	3	0.021	0.09	10	0.85	445	0.02	<1	<5	<5	<20		22	<10	0.04	40	<20			
61.1	2817	Freel & Durham	133	*	<5	0.02	<0.2	125	0.23	<2	0.012	0.03	2	0.04	42	0.02	<1	<5	<5	<20		5	<10	<0.01	3	<20			
61.1	2818	Freel & Durham	156	*	<5	0.07	<0.2	197	0.52	<2	0.011	0.03	<1	0.08	106	0.02	<1	<5	<5	<20		8	<10	<0.01	5	<20			
62.1	401	Road Show	494	*	<5	0.42	<0.2	22	1.12	<2	0.012	0.09	9	0.41	224	0.03	<1	<5	<5	<20		20	<10	0.07	33	<20			
62.1	402	Road Show	<10	*	<5	0.07	<0.2	335	0.34	<2	0.013	<0.01	<1	0.01	42	<0.01	<1	<5	<5	<20		19	<10	<0.01	5	<20			
62.1	2819	Road Show	617	*	<5	0.46	<0.2	48	2.24	4	0.034	0.23	7	0.81	464	0.04	<1	<5	<5	<20		29	<10	0.12	57	<20			
62.1	2820	Road Show	595	*	<5	0.44	0.3	50	2.16	4	0.013	0.21	8	0.76	468	0.04	<1	<5	<5	<20		26	<10	0.11	55	<20			
63.1	3914	December Point	951	*	<5	1.25	<0.2	60	2.10	2	2.440	0.08	11	0.30	865	0.03	2	<5	<5	<20		47	<10	<0.01	33	<20			
63.1	3915	December Point	1027	*	<5	0.28	<0.2	64	1.81	<2	7.057	0.15	9	0.08	586	0.06	2	35	<5	<20		14	<10	<0.01	21	<20			
63.1	3916	December Point	720	*	<5	0.04	0.8	145	2.74	<2	18.680	0.09	1	0.03	252	0.02	<1	141	<5	<20		29	<10	<0.01	15	<20			
63.1	8797	December Point	982	*	<5	0.05	0.3	142	1.88	<2	8.316	0.22	2	0.03	114	0.02	1	50	<5	<20		21	<10	<0.01	19	<20			
63.1	8798	December Point	1008	*	<5	0.53	<0.2	116	1.97	<2	4.957	0.22	4	0.15	862	0.03	2	36	<5	<20		17	<10	<0.01	32	<20			
63.1	8799	December Point	1428	*	<5	0.05	<0.2	106	1.36	<2	5.711	0.33	2	0.01	26	0.02	1	40	<5	<20		18	<10	<0.01	17	<20			
64.1	391	Mitkof Island, FS Rd 6245	103	*	<5	1.18	1.7	39	>10	<2	0.198	0.30	1	0.83	397	0.17	<1	<5	7	<20		39	<10	0.13	98	<20		6	5
65.1	291	Zarembo Is., FS Rd 52009	22	*	<5	9.90	<0.2	42	1.16	3	0.013	0.37	3	0.27	79	0.22	<1	<5	<5	<20		42	<10	0.01	30	<20			
65.1	9651	Zarembo Is., FS Rd 52009	144	*	<5	0.30	3.1	43	19.99	<2	0.108	0.17	8	0.20	265	<0.01	1	68	<5	<20		9	<10	<0.01	26	<20			
66.1	307	Frenchie	**2.89%**	*	<5	0.34	4.8	100	2.24	5	0.032	0.38	13	0.66	320	0.02	<1	<5	<5	<20		37	<10	<0.01	16	<20			
66.1	308	Frenchie	**27.51%**	*	<5	0.10	59.6	38	12.00	<2	0.482	<0.01	<1	0.07	122	<0.01	<1	19	<5	<20		10	<10	<0.01	6	<20			
66.2	2617	Frenchie	20		<2	0.25	73.0	99	8.06	<10	0.570	0.18	<10	0.43	200	<.01		12	<1			22		<.01	14	<10			
66.3	18	Frenchie	>20000	*	<5	0.06	168.9	37	8.08	<2	0.904	0.05	<1	0.14	90	<0.01	<1	7	<5	<20		19	<10	<0.01	6	<20			
66.4	9660	Frenchie	**5.96%**	*	<5	<0.01	36.9	53	2.55	<2	0.113	0.32	5	0.09	47	0.01	<1	6	<5	<20		2	11	<0.01	2	<20			
66.4	9661	Frenchie	11297	*	<5	0.42	1.2	151	4.28	9	0.012	0.25	26	2.10	1114	<0.01	<1	<5	<5	<20		47	<10	<0.01	70	<20			
66.4	9662	Frenchie	**29.08%**	*	<5	0.74	118.2	27	10.32	<2	0.723	<0.01	<1	0.15	575	<0.01	<1	49	<5	<20		11	<10	<0.01	11	<20			
66.5	2616	Frenchie	50		2	0.88	39.5	99	14.10	<10	1.050	0.14	<10	0.21	225	<.01		12	<1			18		<.01	10	<10			
66.6	17	Frenchie	>20000	*	5	0.87	99.1	29	>10	<2	1.883	<0.01	<1	0.11	276	<0.01	<1	16	<5	<20		16	<10	<0.01	4	<20			
66.7	303	Frenchie	**4.80%**	*	<5	0.06	2.5	33	3.22	2	0.033	0.48	4	0.28	58	0.02	<1	<5	<5	<20		11	<10	<0.01	24	<20			
66.7	304	Frenchie	4417	*	<5	8.51	8.0	114	2.64	7	<0.01	0.09	43	2.85	2081	<0.01	<1	<5	<5	<20		1227	<10	<0.01	60	<20			
66.7	305	Frenchie	**24.65%**	*	<5	0.04	7.2	46	12.68	<2	0.862	0.03	<1	0.09	69	<0.01	<1	14	<5	<20		9	<10	<0.01	11	<20			
66.7	306	Frenchie	3734	*	<5	0.09	0.2	80	1.39	4	0.014	0.21	10	1.15	287	0.03	<1	<5	<5	<20		11	<10	<0.01	1	<20			
66.8	207	Frenchie	>20000	*	<5	3.17	24.0	64	>10	<2	0.517	0.21	1	0.30	518	0.02	<1	8	<5	<20		41	<10	<0.01	16	<20			
67.1	15	Lost Zarembo	>20000	*	<5	1.05	130.6	38	>10	<2	0.079	0.04	<1	0.12	876	<0.01	<1	<5	<5	<20		16	<10	0.02	32	<20			
67.1	16	Lost Zarembo	5188	*	8	0.04	112.3	55	>10	5	0.089	0.52	<1	0.63	272	0.03	<1	<5	<5	<20		5	<10	<0.01	13	<20			
67.1	314	Lost Zarembo	14343	*	<5	0.94	3.9	54	10.95	30	<0.01	0.20	20	3.29	1543	0.02	<1	<5	10	<20		53	<10	0.07	248	<20			
67.1	315	Lost Zarembo	0		<5	0.04	0.3	47	2.59	11	0.017	0.55	24	1.10	392	0.03	<1	<5	<5	<20		142	<10	<0.01	26	<20			
67.1	316	Lost Zarembo	0		<5	0.04	86.5	62	5.51	20	0.065	1.12	4	0.94	270	0.06	<1	<5	<5	<20		122	12	<0.01	38	<20			
67.1	317	Lost Zarembo	0		<5	0.05	2.0	50	2.12	13	0.012	0.95	24	0.99	324	0.05	<1	<5	<5	<20		148	<10	<0.01	18	<20			
67.1	318	Lost Zarembo	15305	*	<5	0.18	114.8	21	24.45	3	0.112	0.31	1	0.46	264	0.02	<1	<5	<5	<20		3	<10	<0.01	14	<20			
67.1	319	Lost Zarembo	15633	*	<5	0.15	0.8	34	1.93	10	0.013	0.42	34	1.14	283	0.03	<1	<5	<5	<20		35	<10	0.01	4	<20			
67.1	320	Lost Zarembo	0		<5	0.51	107.3	29	11.55	<2	0.076	0.02	<1	0.08	556	<0.01	<1	6	<5	<20		13	<10	<0.01	33	<20			
67.1	321	Lost Zarembo	0		<5	0.44	49.4	44	12.37	<2	0.037	0.12	<1	0.43	321	0.02	<1	<5	<5	<20		8	<10	0.03	33	<20			
67.1	322	Lost Zarembo	19473	*	<5	0.46	<0.2	47	3.34	10	<0.01	0.57	25	1.82	417	0.03	<1	<5	<5	<20		52	<10	0.09	57	<20			
67.1	2625	Lost Zarembo	10		<2	1.09	>100.0	35	11.05	<10	0.060	<.01	<10	0.04	805	<.01		<2	<1			15		<.01	34	<10			
67.1	9658	Lost Zarembo	177	*	<5	0.01	0.7	47	1.54	3	<0.01	0.13	14	0.02	145	0.11	8	<5	<5	<20		2	<10	0.02	3	<20			
67.1	9667	Lost Zarembo	**29.30%**	*	<5	1.19	195.0	8	6.18	<2	0.086	0.02	<1	0.06	797	<0.01	<1	13	<5	<20		26	17	<0.01	34	<20		<5	2
67.1	9668	Lost Zarembo	689	*	<5	0.01	0.9	52	1.17	2	0.018	0.10	14	<0.01	119	0.08	8	<5	<5	<20		4	<10	0.02	<1	<20			
67.1	9669	Lost Zarembo	19201	*	<5	0.08	<0.2	55	1.91	9	<0.01	0.55	17	1.46	171	0.05	<1	<5	<5	<20		93	<10	0.02	9	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
68.1	298	Gallavantin 1-3	R	G	0.4	FL	Hornblendite w/ po	17		0.3		1291		<2		19		<1	251	148	0.89	<5
68.1	299	Gallavantin 1-3	R	G	0.4	TP	Qz vn	7		<0.1		43		4		53		<1	4	11	2.00	<5
68.1	300	Gallavantin 1-3	R	G	0.1	TP	Hornblendite w/ po, cp	30		1.0		787		5		38		2	71	226	1.58	<5
68.1	301	Gallavantin 1-3	R	G	0.2	TP	Hornblendite w/ po, bornite	14		0.8		1172		3		39		<1	83	344	1.20	<5
68.1	309	Gallavantin 1-3	R	S		TP	Hornblendite w/ po, py, cp	13		0.2		75		6		58		2	3	31	2.69	<5
68.1	310	Gallavantin 1-3	R	S	0.3	TP	Cg hornblendite w/ py, po	12		<0.1		272		9		80		2	7	48	2.51	5
68.1	311	Gallavantin 1-3	SS					6		<0.1		44		4		26		<1	43	28	4.39	<5
68.1	312	Gallavantin 1-3	R	G	0.3	OC	Fest hornblendite w/ po, py	7		0.2		520		5		45		7	37	62	2.15	<5
68.1	313	Gallavantin 1-3	SS					22		<0.1		64		17		75		<1	30	41	1.33	<5
68.1	9656	Gallavantin 1-3	R	Rep		RC	Hbl peg w/ mag, py	10		0.2		60		4		52		2	26	31	2.12	<5
68.1	9657	Gallavantin 1-3	R	Rep		RC	Hbl peg w/ mag, py	14		0.4		631		4		29		<1	186	129	1.20	<5
68.1	9663	Gallavantin 1-3	R	G		TP	Cg hornblendite w/ cg py, mag	9		0.2		201		9		71		<1	14	49	1.62	<5
68.1	9664	Gallavantin 1-3	R	RC	0.2	OC	Granite dike in hornblendite	7		<0.1		43		13		14		<1	4	5	0.24	<5
68.1	9665	Gallavantin 1-3	R	SS			Hornblendite outcrops in stream	<5		<0.1		20		7		76		2	16	9	1.68	<5
68.1	9666	Gallavantin 1-3	R	RC		OC	Fest, cg hornblendite w/ po	15		1.3		2760		9		90		3	264	147	2.07	<5
69.1	295	Zarembo Island Fluorite	R	Rep	3	OC	Stained, sil zone w/ py on fractures	50		<0.1		3		15		23		3	2	<1	0.49	97
69.2	9654	Zarembo Island Fluorite	R	C	0.4	OC	Vuggy, crystalline qz br in andesite	13		<0.1		5		5		31		<1	4	<1	0.18	7
69.3	296	Zarembo Island Fluorite	R	Rep	8	OC	Fest, banded andesite w/ py	15		<0.1		2		10		20		5	2	<1	0.52	28
69.4	19	Zarembo Island Fluorite	R	G	0.3	OC	Geode	<5		<0.1		20		28		172		2	7	2	0.85	<5
69.4	20	Zarembo Island Fluorite	R	G	0.3	OC	Geode	<5		<0.1		12		23		113		2	11	1	0.69	<5
69.4	21	Zarembo Island Fluorite	R	G	0.1	RC	Fluorite vn in basalt	291		0.6		6		14		69		2	3	<1	3.21	132
69.4	22	Zarembo Island Fluorite	R	C	3	OC	Sil, gray-green, banded volc	<5		<0.1		4		12		36		1	10	2	0.76	<5
69.4	23	Zarembo Island Fluorite	R	Rep	10	OC	Basalt	<5		<0.1		40		6		113		3	51	29	5.34	<5
69.4	208	Zarembo Island Fluorite	R	G		RC	Geodes	<5		0.1		8		19		44		1	6	2	0.59	<5
69.4	209	Zarembo Island Fluorite	R	G		RC	Geodes	<5		<0.1		10		18		55		2	11	2	0.79	<5
70.1	293	ZF	R	G	1	OC	Fest felsite	7		<0.1		7		8		47		<1	1	<1	0.71	<5
71.1	354	Round Point	R	C	0.9	OC	Qz-muscovite sc w/ dissem cp, sl	68		55.0		2.10	*	29		1.10	*	17	4	13	0.84	10
71.1	355	Round Point	R	C	0.4	OC	Qz-muscovite sc w/ dissem sulf	62		1.0		262		19		109		9	3	1	0.49	57
71.1	356	Round Point	R	G	0.1	OC	Qz-muscovite sc w/ bands of fg cp & sl	11		17.2		5588		32		3827		20	4	11	0.48	12
71.1	357	Round Point	R	C	0.8	OC	Qz-muscovite sc w/ bands of py, sl, trace cp	30		1.5		349		59		2245		7	3	<1	1.78	7
71.1	358	Round Point	R	C	1.5	OC	Qz-muscovite sc w/ bands of py, sl, trace cp	<5		0.5		29		165		3346		8	3	<1	1.23	46
71.1	359	Round Point	R	C	0.1	OC	Sil band w/ dissem cp	<5		2.9		2521		45		209		20	5	8	0.65	6
71.1	360	Round Point	R	C	1.5	OC	Qz-muscovite sc w/ qz vns	14		<0.1		28		23		27		6	3	<1	0.60	13
71.1	9686	Round Point	R	C	5	OC	Sil, fest, pale gray sc w/ banded py & sl	6		3.1		103		757		7000		8	4	1	1.27	15
71.1	9687	Round Point	R	S		OC	Very pale gray, fest sc w/ banded py & sl	8		2.0		122		31		1.50	*	7	5	<1	1.74	13
72.1	3936	Shrubby Island	R	C	2.1	TP	Ls w/ py	19		0.5		14		476		12555		7	25	4	0.03	52
72.1	3937	Shrubby Island	R	S		TP	Msv py w/ sl & gn in ls	8		2.3		40		3756		6.60	*	5	141	17	0.03	272
72.1	8807	Shrubby Island	R	SC	6@.5	OC	Ls w/ py, sl, gn	6		2.6		45		3646		8.10	*	4	162	19	0.03	303
73.1	8	Exchange	R	Rep	2	OC	Qz vn & fel dike w/ sulf	35		6.5		10		265		174		3	13	6	0.38	<5
73.1	9	Exchange	R	Rep	3	OC	Qz vn & fel dike w/ sulf	131		18.0		23		632		86		2	12	7	0.23	<5
73.1	10	Exchange	R	Rep	3.2	UW	Qz vn w/ sulf	532		58.0		9		2660		204		2	8	9	0.49	<5
73.1	11	Exchange	R	SC	3	UW	Qz vn	<5		0.3		4		11		5		2	8	<1	0.04	<5
73.1	12	Exchange	R	S	0.3	UW	Sulf-rich band in qz vn w/ py & gn	30		5.9		23		253		68		<1	2	5	0.46	<5
73.1	13	Exchange	R	S	0.3	RC	Contact of qz vn & dike	89		11.0		9		381		56		2	9	3	0.14	<5
73.1	14	Exchange	SS					<5		0.4		6		22		65		1	7	7	1.07	<5
73.1	204	Exchange	R	Rep	6.5	OC	Fest qz vn	<5		0.1		15		13		27		2	7	1	0.19	<5
73.1	205	Exchange	R	RC	5	OC	Qz vn	43		9.0		6		348		7		2	14	1	0.03	<5
73.1	206	Exchange	R	RC	5	OC	Qz vn	923		26.6		6		944		8		2	9	<1	0.06	<5
74.1	63	Sunrise	R	PC				<5		<0.1		9		9		72		<1	16	5	1.79	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
68.1	298	Gallavantin 1-3	35	*	<5	1.40	0.2	147	7.69	<2	0.030	0.08	<1	1.30	193	0.13	<1	<5	13	<20		31	<10	0.10	82	<20		6	3
68.1	299	Gallavantin 1-3	682	*	<5	1.74	<0.2	26	3.23	3	0.017	0.37	5	1.12	410	0.21	<1	<5	5	<20		148	<10	0.21	85	<20		<5	1
68.1	300	Gallavantin 1-3	26	*	<5	1.83	<0.2	15	27.47	<2	0.041	0.28	1	1.34	347	0.28	<1	<5	15	<20		75	<10	0.25	272	<20		9	3
68.1	301	Gallavantin 1-3	16	*	<5	1.53	<0.2	21	32.15	<2	0.039	0.18	1	1.20	151	0.17	<1	<5	14	<20		54	<10	0.15	258	<20		10	7
68.1	309	Gallavantin 1-3	683	*	<5	2.62	<0.2	22	7.89	2	0.059	0.40	<1	2.82	349	0.42	4	<5	35	<20		114	<10	0.30	649	<20		<5	<1
68.1	310	Gallavantin 1-3	1034	*	<5	2.59	<0.2	28	6.92	2	0.029	0.72	3	1.80	617	0.37	<1	<5	11	<20		122	<10	0.25	159	<20		<5	1
68.1	311	Gallavantin 1-3	378	*	<5	6.63	<0.2	136	7.68	4	0.020	0.63	<1	4.25	826	0.89	2	<5	37	<20		360	<10	0.49	394	<20		11	6
68.1	312	Gallavantin 1-3	345	*	<5	2.49	<0.2	42	6.91	<2	<0.01	0.47	2	1.97	455	0.37	1	<5	22	<20		93	<10	0.25	240	<20		<5	2
68.1	313	Gallavantin 1-3	642	*	<5	0.89	0.2	38	2.81	4	0.120	0.10	4	0.81	729	0.24	2	<5	6	<20		42	<10	0.10	106	<20		<5	4
68.1	9656	Gallavantin 1-3	349	*	<5	2.37	<0.2	34	5.37	<2	0.011	0.37	4	1.87	446	0.29	<1	<5	18	<20		78	<10	0.25	227	<20		<5	1
68.1	9657	Gallavantin 1-3	64	*	<5	1.02	0.2	114	6.24	<2	0.016	0.04	<1	1.81	247	0.07	2	<5	13	<20		18	<10	0.10	105	<20		20	4
68.1	9663	Gallavantin 1-3	812	*	<5	1.83	<0.2	57	5.06	<2	0.022	0.28	<1	2.33	329	0.27	1	<5	19	<20		76	<10	0.16	133	<20			
68.1	9664	Gallavantin 1-3	897	*	<5	0.07	<0.2	97	0.57	<2	0.012	0.17	<1	0.02	18	0.06	<1	<5	<5	<20		18	<10	<0.01	2	<20		5	<1
68.1	9665	Gallavantin 1-3	633	*	<5	0.57	<0.2	23	3.23	3	0.218	0.21	9	0.87	600	0.32	<1	<5	5	<20		39	<10	0.11	88	<20		<5	1
68.1	9666	Gallavantin 1-3	677	*	<5	1.99	0.3	101	18.43	<2	0.026	0.47	1	1.85	547	0.35	<1	<5	13	<20		85	<10	0.23	185	<20		10	28
69.1	295	Zarembo Island Fluorite	299	*	<5	0.06	0.4	44	0.97	<2	<0.01	0.25	31	0.06	51	0.02	<1	<5	<5	<20		3	<10	<0.01	<1	<20			
69.2	9654	Zarembo Island Fluorite	211	*	<5	0.02	<0.2	127	0.67	<2	0.012	0.04	11	0.02	110	0.03	<1	<5	<5	<20		3	<10	<0.01	2	<20			
69.3	296	Zarembo Island Fluorite	263	*	<5	<0.01	<0.2	70	0.75	3	<0.01	0.26	30	0.06	32	0.05	<1	<5	<5	<20		3	<10	<0.01	2	<20			
69.4	19	Zarembo Island Fluorite	1768	*	<5	0.79	0.4	166	1.47	3	<0.01	0.22	38	0.33	176	0.12	<1	<5	<5	<20		24	<10	<0.01	5	<20			
69.4	20	Zarembo Island Fluorite	914	*	<5	0.62	0.3	171	1.23	3	<0.01	0.19	33	0.24	133	0.11	<1	<5	<5	<20		16	<10	<0.01	4	<20			
69.4	21	Zarembo Island Fluorite	121	*	<5	>10	0.4	100	2.83	6	<0.01	1.79	9	0.14	613	0.95	5	<5	<5	<20		66	<10	<0.01	2	<20			
69.4	22	Zarembo Island Fluorite	243	*	<5	0.86	<0.2	136	1.27	4	<0.01	0.26	37	0.21	207	0.14	<1	<5	<5	<20		13	<10	<0.01	5	<20			
69.4	23	Zarembo Island Fluorite	329	*	<5	5.13	<0.2	107	9.15	8	0.019	0.06	16	3.20	1108	0.52	6	<5	21	<20		209	<10	0.07	180	<20			
69.4	208	Zarembo Island Fluorite	510	*	<5	0.11	<0.2	157	1.09	2	<0.01	0.16	29	0.22	112	0.09	<1	<5	<5	<20		9	<10	<0.01	3	<20			
69.4	209	Zarembo Island Fluorite	748	*	<5	0.08	<0.2	175	1.30	3	<0.01	0.19	32	0.36	94	0.11	1	<5	<5	<20		11	<10	<0.01	4	<20			
70.1	293	ZF	72	*	<5	0.05	<0.2	46	0.69	5	0.013	0.40	5	0.03	79	0.02	<1	<5	<5	<20		2	<10	<0.01	1	<20			
71.1	354	Round Point	6400	*	<5	0.05	32.9	61	>10	<2	0.139	0.18	10	0.15	261	0.02	2	<5	<5	<20		7	<10	0.01	<1	<20			
71.1	355	Round Point	4521	*	<5	0.01	0.4	84	2.37	<2	0.022	0.36	6	0.03	28	<0.01	<1	<5	<5	<20		1	<10	<0.01	<1	<20			
71.1	356	Round Point	7855	*	<5	0.02	12.4	80	3.50	<2	0.054	0.17	8	0.13	192	0.01	<1	<5	<5	<20		5	<10	<0.01	<1	<20			
71.1	357	Round Point	**4.39%**	*	<5	0.05	7.9	59	2.68	7	0.036	0.58	17	0.21	285	0.04	<1	<5	<5	<20		95	<10	0.02	2	<20			
71.1	358	Round Point	6291	*	<5	0.03	1.7	49	6.64	2	0.024	0.64	22	0.47	150	0.01	2	<5	<5	<20		4	<10	0.02	<1	<20			
71.1	359	Round Point	4170	*	<5	0.53	1.5	64	5.27	<2	<0.01	0.26	16	0.23	335	0.06	1	<5	<5	<20		32	<10	0.02	<1	<20			
71.1	360	Round Point	5820	*	<5	0.13	<0.2	72	3.04	2	0.012	0.34	14	0.19	99	0.01	1	<5	<5	<20		11	<10	<0.01	<1	<20			
71.1	9686	Round Point	16934	*	<5	0.07	21.1	103	3.14	4	0.269	0.53	16	0.42	320	0.04	1	<5	<5	<20		24	<10	0.02	1	<20			
71.1	9687	Round Point	**4.28%**	*	<5	0.01	58.3	99	3.01	5	0.527	0.42	3	0.17	148	0.03	<1	<5	<5	<20		45	<10	<0.01	<1	<20			
72.1	3936	Shrubby Island	<10	*	<5	>10	54.4	3	3.79	<2	1.635	0.02	3	0.60	237	<0.01	<1	6	<5	<20		205	<10	<0.01	3	<20			
72.1	3937	Shrubby Island	<10	*	<5	2.54	236.0	18	>10	10	6.137	0.02	<1	1.22	228	<0.01	<1	22	<5	<20		22	16	<0.01	8	73			
72.1	8807	Shrubby Island	<10	*	<5	3.48	251.2	16	>10	9	5.253	0.03	<1	0.94	220	<0.01	<1	23	<5	<20		37	13	<0.01	6	96			
73.1	8	Exchange	382	*	10	3.05	0.7	177	3.29	<2	0.276	0.25	3	1.22	947	0.04	1	<5	7	<20		551	<10	<0.01	23	<20			
73.1	9	Exchange	167	*	29	2.05	0.8	178	3.00	<2	0.153	0.14	2	0.70	666	0.05	<1	6	<5	<20		323	<10	<0.01	13	<20			
73.1	10	Exchange	213	*	71	4.07	1.2	96	3.76	<2	0.313	0.13	2	1.43	1364	0.04	<1	<5	7	<20		573	<10	<0.01	21	<20			
73.1	11	Exchange	11	*	<5	0.25	<0.2	307	0.40	<2	0.014	0.01	<1	0.03	111	0.01	<1	<5	<5	<20		19	<10	<0.01	1	<20			
73.1	12	Exchange	987	*	6	3.79	0.5	58	3.28	<2	0.184	0.24	5	0.48	952	0.06	<1	<5	<5	<20		318	<10	<0.01	8	<20			
73.1	13	Exchange	28	*	14	0.74	0.4	286	1.52	<2	0.096	0.06	<1	0.23	278	0.04	<1	<5	<5	<20		117	<10	<0.01	10	<20			
73.1	14	Exchange	506	*	<5	0.40	<0.2	15	2.97	<2	0.103	0.18	6	0.50	1460	0.03	2	<5	<5	<20		37	<10	0.08	59	<20			
73.1	204	Exchange	231	*	<5	1.30	<0.2	242	1.06	<2	0.130	0.11	5	0.19	460	0.05	<1	<5	<5	<20		133	<10	<0.01	5	<20			
73.1	205	Exchange	<10	*	14	0.01	<0.2	221	0.48	<2	0.048	<0.01	<1	0.02	43	<0.01	<1	<5	<5	<20		3	<10	<0.01	1	<20			
73.1	206	Exchange	<10	*	37	0.04	<0.2	312	0.48	<2	0.065	<0.01	<1	0.03	88	0.01	<1	<5	<5	<20		5	<10	<0.01	1	<20			
74.1	63	Sunrise	837	*	<5	0.96	<0.2	198	2.46	<2	0.060	0.27	11	0.73	614	0.16	7	<5	<5	<20		122	<10	0.14	56	<20			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
74.1	64	Sunrise	SS					<5		<0.1		10		11		92		1	18	8	1.80	<5
74.1	65	Sunrise	SS					<5		<0.1		8		8		71		<1	16	6	1.62	<5
75.1	730	Keating Range	R	G	0.5	OC	Mafic volc	6		<0.1		106		9		77		3	14	26	5.05	<5
75.2	993	Keating Range	R	G		OC	Fest volc	<5		<0.1		8		22		43		5	3	2	0.73	26
76.1	999	Mosman Inlet	R	Rep	0.4	OC	Tactite w/ mal & mag	472		10.7		2632		13		218		5	21	43	0.44	80
76.1	8994	Mosman Inlet	R	G	0.1	OC	Tactite w/ mal & mag	285		14.5		1803		9		248		5	23	40	2.28	435
76.1	8995	Mosman Inlet	R	G	0.4	RC	Tactite w/ cp & mag	1481		35.4		3635		15		585		6	45	93	0.59	176
76.1	9745	Mosman Inlet	R	G	0.7	OC	Tactite w/ garnets	50		0.3		158		22		32		4	8	7	1.60	284
77.1	467	Steamer Bay	R	G	0.4	FL	Sil, qz gs br w/ po	72		10.9		1407		1.01	*	1.91	*	14	9	13	1.63	59
77.1	8719	Steamer Bay	R	G		FL	Pale gray sil volc w/ dissem & veinlets of po	<5		1.0		78		62		80		11	11	14	3.03	8
78.1	596	Obsidian	R	C	0.3	OC	Qz stringers in slate at tonalite contact	<5		1.0		36		217		206		3	90	15	1.98	<5
78.1	8839	Obsidian	R	Rep		OC	Tonalite/slate contact	<5		1.3		44		179		784		4	79	16	2.92	20
79.1	76	Salamander Creek Pit	R	G	0.3	RC	Sil metaseds w/ po & cp	<5		0.6		227		6		41		4	23	13	2.57	<5
79.1	77	Salamander Creek Pit	R	G	0.3	RC	Fest, sil metased w/ po	<5		0.4		84		5		25		4	46	17	1.68	<5
79.1	78	Salamander Creek Pit	R	G	0.5	RC	Sil fest sc	<5		0.3		60		7		82		17	22	8	1.84	<5
79.1	79	Salamander Creek Pit	R	G	0.2	RC	Sil fest sc w/ po	<5		0.2		68		7		129		5	39	11	2.57	<5
79.1	80	Salamander Creek Pit	R	G	0.7	RC	Fest contact zone in metaseds	<5		<0.1		36		7		29		2	20	8	1.91	<5
79.1	243	Salamander Creek Pit	R	S	1	TP	Garnet-mica sc	<5		0.3		61		9		52		4	14	4	3.63	<5
79.1	244	Salamander Creek Pit	R	Rep	14	TP	Granite	<5		<0.1		14		7		104		2	13	5	2.69	<5
80.1	468	Bruiser	R	C	1.6	OC	Qz w/ slate & po	<5		0.4		64		23		101		6	46	9	2.47	<5
80.1	469	Bruiser	R	C	4	OC	Qz vn	<5		0.3		10		7		24		<1	14	1	0.32	<5
80.1	8720	Bruiser	R	C	0.2	OC	Qz vn in black sandy slate to phy	<5		<0.1		25		4		14		2	25	3	0.52	<5
80.1	8721	Bruiser	R	C	1	OC	Qz vn in sandy slate	<5		<0.1		10		5		3		6	15	<1	0.05	<5
81.1	8716	Niblack Island	R	Rep		OC	Fel intrusive w/ trace cp	11		8.5		1725		14		198		3	2	<1	0.96	70
82.1	772	K & D	R	G	1	RC	Qz vn	55		1.8		<1		36		138		<1	4	<1	0.02	<5
82.1	8665	K & D	R	C	0.1	OC	Unknown talc-like mineral, qz, & py	179		6.7		41		76		239		7	60	10	0.95	50
82.2	8664	K & D	R	C	0.5	OC	Wedge of gray sulf in qz vn	32		2.4		103		49		271		23	93	24	0.61	10
82.3	771	K & D	R	C	5.5	OC	Qz vn	351		5.7		17		194		299		3	18	7	0.08	124
82.4	769	K & D	R	Rep	4	OC	Qz vn	105		3.1		6		123		319		<1	15	3	0.11	452
82.5	8661	K & D	R	Rep	4.3	OC	Qz vn	35		1.2		23		26		32		3	12	1	0.04	24
82.6	8663	K & D	R	Rep	1.3	OC	Chl to carb sc w/ py	14		0.5		77		10		401		8	119	32	2.32	26
82.7	8660	K & D	R	C	0.3	OC	Layer of gray sulf in qz vn	3716		33.9		197		518		4712		6	55	21	0.38	6323
82.8	8662	K & D	R	Rep	1.6	OC	Qz vn w/ minor py & gray sulf	863		0.8		12		40		76		4	14	1	0.06	1376
82.9	3693	K & D	R	C	2.3	UW	Qz w/ gray sulf, stibnite, po	0.757	*	50.0		8		2181		2324		<1	9	2	0.06	**1.27%**
82.9	3694	K & D	R	S		UW	Qz w/ stibnite, py, po	7447		169.0		94		1.06	*	6528		6	17	5	0.33	>10000
82.10	3691	K & D	R	C	1.2	OC	Chl sc w/ minor po	7		0.4		59		13		295		4	115	44	4.02	12
82.11	3692	K & D	R	C	1.3	OC	Carb sc w/ po	21		0.7		80		16		357		9	101		2.07	8
82.12	770	K & D	R	C	2.75	OC	Qz vn w/ bands of gp	1647		25.0		5		595		735		2	9	2	0.08	517
82.13	3690	K & D	R	CC	2.3	OC	Qz vn w/ ribbons of gray sulf	994		26.2		22		422		1206		4	13	2	0.12	523
82.14	3695	K & D	R	Rep		OC	Fractured qz vn, no evident sulf	55		0.5		9		46		38		2	8	4	0.37	70
82.15	859	K & D	R	C	7	OC	Qz vn	368		13.2		2		52		61		3	3	<1	0.03	15
82.16	774	K & D	R	C	6	OC	Qz vn	69		2.2		<1		29		8		2	5	<1	0.01	<5
82.17	858	K & D	R	C	5	OC	Qz vn	<5		<0.1		3		<2		<1		4	5	<1	0.02	<5
82.18	773	K & D	R	C	6	OC	Qz vn w/ gp phy	<5		<0.1		5		<2		3		6	7	3	0.04	6
83.1	6411	Louise Group	R	CC		UW	Garnet-qz-bt gneiss w/ po lenses	8		0.4		1771		4		50		5	8	11	2.15	<5
83.2	974	Louise Group	R	CC	2	UW	Sheared amp w/ qz	14		0.4		71		5		92		1	73	37	3.21	122
83.3	6412	Louise Group	R	S		UW	Po & cp lenses in garnet-qz-bt gneiss	38		2.1		4899		3		75		5	12	30	1.55	35
83.4	973	Louise Group	R	CC	5	UW	Cg garnet-qz-bt gneiss	8		0.3		1150		3		15		6	8	9	1.78	<5
84.1	389	Sun 1-2	R	CC	0.1	OC	Msv band of gn w/ sl	1411		1245.5		272		9.99	*	7.10	*	6	17	7	2.32	173

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
74.1	64	Sunrise	705	*	<5	0.58	<0.2	35	2.84	<2	0.051	0.18	7	0.96	660	0.03	4	<5	<5	<20		48	<10	0.13	68	<20			
74.1	65	Sunrise	674	*	<5	0.52	<0.2	28	2.43	<2	0.045	0.15	7	0.83	547	0.03	4	<5	<5	<20		43	<10	0.12	59	<20			
75.1	730	Keating Range	150	*	<5	3.63	0.6	15	6.10	8	0.015	0.04	3	1.83	1023	0.38	17	<5	7	5	*	156	<10	0.22	224	9	*		
75.2	993	Keating Range	908	*	<5	0.02	<0.2	42	2.51	7	0.012	0.17	4	0.04	214	0.09	<1	<5	<5	<4	*	2	<10	<0.01	3	7	*		
76.1	999	Mosman Inlet	658	*	11	>10	1.4	59	>10	<2	0.017	<0.01	4	0.07	1715	<0.01	<1	<5	<5	397	*	<1	23	0.01	8	48	*		
76.1	8994	Mosman Inlet	<10	*	26	>10	3.0	56	>10	<2	0.014	0.02	16	0.35	2666	<0.01	<1	<5	<5	318	*	<1	<10	0.09	34	35	*		
76.1	8995	Mosman Inlet	<10	*	73	>10	2.0	44	>10	<2	0.013	0.01	23	0.27	5467	<0.01	<1	<5	<5	738	*	<1	14	<0.01	9	309	*		
76.1	9745	Mosman Inlet	<10	*	<5	>10	1.2	64	>10	<2	0.012	<0.01	6	0.09	1281	<0.01	<1	<5	<5	902	*	<1	<10	0.06	18	16	*		
77.1	467	Steamer Bay	243		<5	6.88	238.1	70	5.19	3	3.164	0.11	3	1.71	1677	<0.01	<1	7	<5	31		90	18	<0.01	32	<20	*		
77.1	8719	Steamer Bay	482		<5	1.98	0.2	61	5.41	6	0.018	0.07	2	1.64	743	0.19	<1	<5	6	36		97	<10	0.13	129	<20	*		
78.1	596	Obsidian	579	*	<5	2.06	1.7	297	3.11	2	<0.01	0.85	5	1.49	520	0.05	3	<5	5	<4	*	424	<10	0.11	55	<4	*		
78.1	8839	Obsidian	941	*	<5	0.64	7.5	207	4.06	2	0.017	1.48	6	1.79	361	0.09	4	<5	7	<4	*	60	<10	0.20	78	<4	*		
79.1	76	Salamander Creek Pit	124	*	<5	2.38	<0.2	136	4.15	<2	<0.01	0.19	6	0.55	345	0.20	4	<5	<5	<20		104	<10	0.12	53	<20			
79.1	77	Salamander Creek Pit	696	*	<5	0.13	0.2	105	4.73	<2	0.015	1.01	5	1.01	246	0.06	2	<5	8	<20		7	<10	0.17	92	<20			
79.1	78	Salamander Creek Pit	861	*	<5	0.43	0.3	123	4.15	<2	0.014	0.65	6	1.25	347	0.06	3	<5	11	<20		10	<10	0.14	111	<20			
79.1	79	Salamander Creek Pit	933	*	<5	0.59	<0.2	133	5.58	<2	<0.01	1.49	5	1.57	525	0.12	4	<5	16	<20		23	<10	0.27	211	<20			
79.1	80	Salamander Creek Pit	704	*	<5	0.34	<0.2	138	3.21	<2	<0.01	0.90	6	0.85	168	0.08	2	<5	<5	<20		27	<10	0.15	80	<20			
79.1	243	Salamander Creek Pit	1768	*	<5	0.05	<0.2	85	6.35	<2	<0.01	2.25	10	2.24	220	0.07	4	<5	12	<20		5	<10	0.31	190	<20			
79.1	244	Salamander Creek Pit	995	*	<5	0.64	<0.2	87	4.60	<2	<0.01	1.43	8	1.58	673	0.11	4	<5	8	<20		30	<10	0.25	96	<20			
80.1	468	Bruiser	417		<5	2.36	0.6	206	2.17	4	<0.01	0.42	<1	0.78	238	0.13	<1	<5	<5	133		168	<10	0.08	47	<20	*		
80.1	469	Bruiser	104		<5	0.08	<0.2	408	0.73	<2	<0.01	0.13	2	0.25	66	0.03	<1	<5	<5	75		6	<10	0.03	16	<20	*		
80.1	8720	Bruiser	53		<5	1.47	<0.2	219	0.60	<2	<0.01	0.13	<1	0.27	186	0.04	<1	<5	<5	54		69	<10	0.02	14	<20	*		
80.1	8721	Bruiser	<10		<5	0.09	<0.2	348	0.38	<2	<0.01	0.02	<1	0.05	31	0.01	1	<5	<5	8		8	<10	<0.01	3	<20	*		
81.1	8716	Niblack Island	42		5	0.13	0.8	120	1.88	7	<0.01	0.49	29	0.02	126	0.08	2	<5	<5	6		<1	<10	0.02	3	<20	*		
82.1	772	K & D	36	*	<5	0.02	1.4	126	0.25	<2	0.040	<0.01	<1	0.02	19	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	1	8	*		
82.1	8665	K & D	1078	*	<5	0.63	2.0	171	2.65	10	0.118	0.10	1	3.03	162	0.02	2	49	<5	<4	*	56	<10	<0.01	10	19	*		
82.2	8664	K & D	2933	*	<5	4.56	2.0	77	6.12	<2	0.209	0.34	4	0.39	721	0.01	<1	14	<5	6	*	207	<10	<0.01	38	26	*		
82.3	771	K & D	285	*	<5	0.70	3.1	141	1.18	<2	0.115	0.04	<1	0.07	135	<0.01	<1	8	<5	<4	*	34	<10	<0.01	4	10	*		
82.4	769	K & D	116	*	<5	0.28	3.4	133	0.56	<2	0.111	0.03	<1	0.26	103	<0.01	<1	<5	<5	<4	*	14	<10	<0.01	3	7	*		
82.5	8661	K & D	<10	*	<5	0.02	0.3	218	0.36	<2	0.029	<0.01	<1	0.08	106	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	<1	<4	*		
82.6	8663	K & D	1247	*	<5	6.50	2.0	182	6.36	4	0.150	0.16	6	2.37	852	0.01	1	34	7	<4	*	345	<10	<0.01	87	40	*		
82.7	8660	K & D	1223	*	<5	3.10	64.1	150	3.81	<2	2.060	0.19	1	0.38	274	<0.01	<1	24	<5	<4	*	92	11	<0.01	20	<4	*		
82.8	8662	K & D	29	*	<5	0.06	4.7	276	0.59	<2	0.055	0.01	<1	0.16	45	<0.01	<1	<5	<5	<4	*	3	<10	<0.01	3	<4	*		
82.9	3693	K & D	97	*	8	0.28	28.4	206	1.55	<2		0.02	<1	0.02	64	<0.01	<1	51	<5	<4	*	14	<10	<0.01	4	<4	*		
82.9	3694	K & D	169	*	29	0.50	179.7	194	5.07	<2	14.400	0.06	1	0.50	103	<0.01	1	>2000	<5	57	*	25	<10	<0.01	11	<4	*		
82.10	3691	K & D	382	*	<5	3.97	<0.2	394	7.19	3	0.021	0.08	6	4.09	856	0.02	2	<5	12	<4	*	147	<10	0.23	186	<4	*		
82.11	3692	K & D	894	*	<5	6.18	2.5	135	6.84	5		0.16	<1	2.42	893	0.01	9	25	8	<4	*	280	<10	0.01	100	8	*		
82.12	770	K & D	131	*	<5	0.14	7.9	131	0.64	<2	0.318	0.02	<1	0.10	32	<0.01	<1	11	<5	<4	*	5	12	<0.01	5	7	*		
82.13	3690	K & D	125	*	<5	0.06	16.5	256	0.81	<2	0.507	0.03	<1	0.12	42	<0.01	<1	6	<5	<4	*	4	11	<0.01	8	<4	*		
82.14	3695	K & D	433	*	<5	0.09	0.7	125	0.25	<2	0.034	0.11	<1	0.04	172	0.17	<1	42	<5	<4	*	13	<10	<0.01	2	<4	*		
82.15	859	K & D	121	*	<5	<0.01	0.6	158	0.25	<2	0.121	0.02	<1	0.01	10	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	5	8	*		
82.16	774	K & D	13	*	<5	<0.01	<0.2	157	0.21	<2	0.019	<0.01	<1	<0.01	20	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	<1	8	*		
82.17	858	K & D	21	*	<5	0.01	0.2	141	0.20	<2	0.016	<0.01	<1	0.01	28	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	3	8	*		
82.18	773	K & D	60	*	<5	<0.01	<0.2	153	0.29	<2	0.012	<0.01	<1	0.02	89	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	5	8	*		
83.1	6411	Louise Group	945	*	<5	0.30	<0.2	181	>10	6	9.884	0.93	19	1.24	366	0.07	2	<5	<5	<4	*	5	<10	0.07	26	15	*		
83.2	974	Louise Group	1605	*	<5	6.82	0.6	121	5.24	<2	2.438	0.18	2	2.18	948	0.04	5	<5	16	<4	*	125	<10	<0.01	93	10	*		
83.3	6412	Louise Group	214	*	<5	0.51	<0.2	110	>10	13	3.432	0.33	3	0.74	298	0.03	5	<5	<5	<4	*	4	<10	0.04	67	12	*		
83.4	973	Louise Group	718	*	<5	0.14	0.3	219	6.51	2	0.098	0.67	26	0.84	271	0.05	4	<5	<5	5	*	4	<10	0.07	10	12	*		
84.1	389	Sun 1-2	641	*	<5	1.70	726.3	187	3.17	7	3.540	0.29	6	0.68	1549	0.11	2	1017	<5	942	*	66	13	0.08	70	<4	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
84.1	543	Sun 1-2	SS					160		0.4		50		5		75		6	41	11	1.70	19
84.1	544	Sun 1-2	R	G	0.1	FL	Fest gneiss w/ 1/4" po band	42		1.4		83		8		73		16	50	24	5.83	21
84.1	2863	Sun 1-2	R	G	1.3	OC	Highly fest layer	16		0.5		84		5		54		9	42	16	3.29	<5
84.1	2864	Sun 1-2	R	G	0.5	OC	Vn containing green translucent mineral	26		7.0		37		81		68		<1	377	44	1.19	1463
84.1	8656	Sun 1-2	R	S		FL	Cobble of gneiss w/ py & trace cp	27		3.7		1888		9		75		4	160	151	0.51	12
85.1	385	The Islander	R	CC	0.5	OC	Qz-cc vn w/ py, sl, cp	7352		13.1		4530		340		2.50	*	4	23	45	0.98	129
85.1	386	The Islander	R	G	1	OC	Gw w/ py	116		0.6		250		49		553		2	32	33	2.25	14
85.1	387	The Islander	R	C	0.9	OC	Msv py, sl, cp	1.077	*	37.1		7463		404		9.70	*	3	12	45	0.48	>10000
85.1	388	The Islander	R	C	0.1	OC	Qz-cc vn	92		0.2		28		22		402		6	2	1	0.23	31
85.1	8652	The Islander	R	C	0.45	OC	Msv band of py & sl in gw	7584		16.3		3767		707		8.60	*	4	18	34	0.15	>10000
85.1	8653	The Islander	R	SC	7.5@.5	OC	Py- & sl-rich zone in qz-rich gw	1645		4.7		684		1287		1.50	*	3	20	24	1.11	1956
85.1	8654	The Islander	R	C	0.4	OC	Vn of msv sulf in gw	0.669	*	20.2		4731		384		8.20	*	3	7	18	0.29	>10000
85.1	8655	The Islander	R	C	0.45	OC	Barren qz vn	47		<0.1		34		16		256		3	6	2	0.40	85
86.1	6403	Bay Point	R	Rep	3	OC	Qz-chl & qz-ser sc w/minor sulf	41		0.2		732		6		23		3	10	13	2.44	204
86.1	6404	Bay Point	R	G		RC	Qz-chl-ser sc w/ concordant py lenses	200		3.7		1520		25		26		7	22	64	1.25	174
86.2	6402	Bay Point	R	S		OC	Qz-ser sc w small lenses of msv py	67		0.2		22		11		10		4	126	101	0.99	45
86.3	6400	Bay Point	R	SC	18@1	OC	Qz-ser & qz-chl sc w/ lenses of po, py, minor cp	23		0.3		521		9		19		29	52	34	1.76	<5
86.3	6401	Bay Point	R	S		OC	Sil ser sc w/ po, py, cp	115		0.6		1426		15		25		53	168	139	1.93	16
86.3	8936	Bay Point	R	G	0.3	OC	Fest sil sc w/ 7% fg py & sl	78		0.5		454		87		112		3	26	26	1.91	7
86.3	8937	Bay Point	R	CC	0.35	OC	Sil shear w 0.4 ft band of py	850		2.0		133		126		590		8	4	6	0.40	10
86.3	8938	Bay Point	R	CC	1.95	OC	Sil band w/ 70% fg py	2942		2.2		3752		30		99		8	22	111	0.79	25
86.3	8939	Bay Point	R	CC	2.6	OC	Sil chl sc w/ bands & lenses of py	1211		0.4		198		7		25		5	19	63	0.90	19
86.4	6399	Bay Point	R	CC	0.8	OC	Carbonaceous layer w/ banded sulf in chl sc	<5		0.2		209		9		95		2	32	35	3.38	<5
87.1	567	Colp & Lee	SS					<5		<0.1		16		8		88		<1	10	14	1.36	<5
87.1	568	Colp & Lee	SS					<5		<0.1		13		9		71		<1	8	13	1.10	8
87.1	2872	Colp & Lee	SS					16		<0.1		9		4		48		<1	6	9	0.86	7
88.1	2800	Cascade	R	C	6.5	UW	Shear zone w/ py	38		4.9		58		286		372		4	34	11	0.53	65
88.1	2801	Cascade	R	C	3.5	UW	Shear zone w/ py	589		1.3		33		57		203		14	33	12	0.35	>10000
88.1	2802	Cascade	R	C	5.6	UW	Shear zone w/ py	205		2.5		41		30		122		14	28	4	0.32	544
88.1	3668	Cascade	R	C	4.4	UW	Sil sc w/ py	32		1.1		120		15		364		16	35	5	0.36	197
88.1	3669	Cascade	R	Rep	6	UW	Sil sc w/ py	41		0.6		120		14		327		27	56	8	0.40	26
88.1	3670	Cascade	R	G		TP	Qz-ser sc w/ fg sulf	<5		0.7		76		17		290		3	98	14	0.60	14
88.1	3671	Cascade	R	Rep	0.9	OC	Sil bt-ser sc w/ minor py & fg sulf	<5		0.2		65		9		39		7	25	4	0.37	<5
88.1	3672	Cascade	R	Rep	9	TP	Sil sc in shear zone	183		0.9		53		49		351		15	40	6	0.25	4574
89.1	554	Dave's Dream	SS					8		0.2		14		8		61		4	11	13	1.84	5
89.1	555	Dave's Dream	SS					5		0.1		16		3		53		<1	8	9	0.94	<5
89.1	556	Dave's Dream	SS					7		0.2		22		4		63		<1	10	12	1.09	7
89.1	557	Dave's Dream	SS					17		<0.1		13		5		70		4	12	19	0.71	<5
89.1	558	Dave's Dream	SS					<5		0.2		11		5		58		3	9	12	1.39	<5
89.1	559	Dave's Dream	SS					<5		<0.1		17		4		58		<1	10	11	0.93	<5
89.1	560	Dave's Dream	SS					96		0.3		14		4		64		3	10	18	0.66	6
89.1	561	Dave's Dream	SS					7		<0.1		16		6		75		<1	9	12	1.09	7
89.1	562	Dave's Dream	SS					753		0.2		13		5		62		3	11	15	1.27	5
89.1	563	Dave's Dream	SS					187		0.1		10		9		65		7	13	12	1.81	<5
89.1	564	Dave's Dream	SS					6		<0.1		20		5		80		<1	11	15	1.41	8
89.1	565	Dave's Dream	SS					13		0.2		14		7		65		3	10	17	0.79	11
89.1	566	Dave's Dream	SS					6		<0.1		12		3		45		<1	7	9	0.88	5
89.1	2868	Dave's Dream	SS					<5		0.2		15		6		75		4	11	18	0.94	7
89.1	2869	Dave's Dream	SS					<5		<0.1		12		3		53		<1	10	10	0.92	13

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
84.1	543	Sun 1-2	1361	*	<5	1.29	1.5	24	2.79	3	0.037	0.26	8	0.53	171	0.11	2	<5	<5	<4	*	50	<10	0.07	38	7	*		
84.1	544	Sun 1-2	104	*	<5	4.01	1.2	76	7.60	9	0.027	0.42	12	0.99	571	0.44	<1	<5	<5	<4	*	119	<10	0.19	54	14	*		
84.1	2863	Sun 1-2	960	*	<5	0.99	0.3	119	4.56	10	0.026	0.36	6	0.64	284	0.15	2	<5	7	<4	*	37	<10	0.05	55	4	*		
84.1	2864	Sun 1-2	1731	*	<5	0.96	<0.2	373	2.55	2	0.031	0.39	4	1.07	174	0.05	2	<5	<5	<4	*	26	<10	0.08	43	<4	*		
84.1	8656	Sun 1-2	44	*	<5	0.69	<0.2	28	>10	<2	0.031	0.03	6	0.22	102	0.10	1	<5	<5	6	*	35	<10	0.07	16	6	*		
85.1	385	The Islander	39	*	<5	4.02	180.5	102	>10	<2	4.880	0.09	1	0.77	986	0.02	<1	<5	5	6	*	135	<10	0.04	50	<4	*		
85.1	386	The Islander	488	*	<5	4.12	2.5	147	5.97	<2	0.117	0.29	1	2.30	1151	0.04	<1	<5	6	<4	*	192	<10	0.14	130	<4	*		
85.1	387	The Islander	<10	*	27	0.10	571.6	70	>10	<2	30.100	0.03	<1	0.43	458	0.03	<1	7	<5	22	*	7	<10	<0.01	19	<4	*		
85.1	388	The Islander	<10	*	10	>10	2.0	17	0.50	<2	0.116	<0.01	<1	0.16	714	0.01	<1	<5	<5	<4	*	2340	<10	<0.01	9	<4	*		
85.1	8652	The Islander	<10	*	<5	0.13	577.6	79	>10	<2	26.020	0.08	<1	0.06	286	0.07	<1	15	<5	22	*	8	<10	<0.01	4	<4	*		
85.1	8653	The Islander	211	*	<5	6.45	94.7	113	>10	<2	4.080	0.26	2	0.88	1114	0.04	<1	<5	6	<4	*	145	<10	0.08	58	<4	*		
85.1	8654	The Islander	<10	*	7	0.34	283.3	39	8.74	<2	18.980	0.03	<1	0.25	277	0.01	1	<5	<5	28	*	20	<10	<0.01	13	<4	*		
85.1	8655	The Islander	<10	*	<5	>10	1.3	91	0.90	<2	0.065	<0.01	3	0.41	446	0.02	<1	<5	<5	<4	*	901	<10	0.01	20	<4	*		
86.1	6403	Bay Point	158	*	<5	7.96	1.0	45	4.48	<2	0.016	0.28	12	2.59	879	0.03	1	<5	<5	<4	*	1470	<10	0.03	34	11	*		
86.1	6404	Bay Point	284	*	<5	3.02	1.1	55	>10	<2	0.791	0.82	7	0.67	312	0.06	<1	18	<5	<4	*	967	<10	0.09	43	14	*		
86.2	6402	Bay Point	428	*	<5	0.51	0.3	108	8.91	<2	0.056	0.35	1	0.38	108	0.08	3	<5	<5	<4	*	37	<10	0.18	31	9	*		
86.3	6400	Bay Point	472	*	<5	1.18	0.3	73	6.73	<2	0.049	0.37	21	1.05	293	0.09	4	<5	<5	<4	*	188	<10	0.15	67	10	*		
86.3	6401	Bay Point	105	*	<5	1.18	0.3	100	>10	<2	0.096	0.11	60	1.38	313	0.05	3	<5	<5	6	*	174	<10	0.11	78	12	*		
86.3	8936	Bay Point	372	*	<5	1.08	0.4	65	5.65	<2	0.074	0.44	4	1.19	1662	0.05	2	<5	<5	4	*	135	<10	0.11	49	12	*		
86.3	8937	Bay Point	436	*	<5	0.18	3.5	75	>10	<2	1.697	0.23	3	0.04	69	0.04	<1	<5	<5	<4	*	20	<10	0.05	23	6	*		
86.3	8938	Bay Point	89	*	<5	0.62	0.7	96	>10	<2	0.279	0.14	2	0.56	507	0.01	<1	<5	<5	<4	*	15	<10	0.04	47	6	*		
86.3	8939	Bay Point	553	*	<5	0.73	0.3	101	>10	<2	0.232	0.38	5	0.39	232	0.02	2	<5	<5	<4	*	29	<10	0.11	38	11	*		
86.4	6399	Bay Point	363	*	<5	3.33	0.3	47	6.20	<2	0.041	0.27	5	1.30	1031	0.05	7	<5	6	<4	*	116	<10	0.25	124	10	*		
87.1	567	Colp & Lee	1183	*	<5	0.77	0.2	24	4.33	2	0.048	0.50	17	0.85	629	0.02	6	<5	<5	<4	*	57	<10	0.14	85	<4	*		
87.1	568	Colp & Lee	1065	*	<5	0.67	0.2	23	4.21	2	0.060	0.44	15	0.73	505	0.02	7	<5	<5	<4	*	43	<10	0.13	90	4	*		
87.1	2872	Colp & Lee	1311	*	<5	0.51	0.2	24	2.58	<2	0.026	0.33	10	0.59	351	0.04	4	<5	<5	<4	*	33	<10	0.11	58	<4	*		
88.1	2800	Cascade	944	*	<5	0.30	3.5	115	3.96	<2	1.207	0.24	6	0.27	510	<0.01	<1	34	8	<4	*	26	<10	<0.01	41	14	*		
88.1	2801	Cascade	588	*	<5	0.08	34.0	165	2.77	<2	0.187	0.18	4	0.02	25	<0.01	<1	38	<5	<4	*	6	<10	<0.01	69	<4	*		
88.1	2802	Cascade	619	*	<5	0.04	2.4	165	2.59	<2	4.015	0.19	4	0.01	19	<0.01	<1	17	<5	<4	*	5	<10	<0.01	94	9	*		
88.1	3668	Cascade	439	*	<5	0.10	5.1	146	2.44	<2	0.251	0.16	3	0.02	21	<0.01	1	19	<5	<4	*	3	<10	<0.01	105	<4	*		
88.1	3669	Cascade	1068	*	<5	0.77	3.9	109	2.72	<2	0.083	0.22	6	0.29	350	<0.01	<1	17	5	<4	*	33	<10	<0.01	48	7	*		
88.1	3670	Cascade	1066	*	<5	0.35	1.1	96	3.69	<2	0.052	0.28	6	0.84	316	<0.01	<1	8	<5	<4	*	12	<10	<0.01	35	4	*		
88.1	3671	Cascade	767	*	<5	0.34	<0.2	181	1.48	<2	0.030	0.13	6	0.16	84	0.01	<1	<5	<5	<4	*	11	<10	0.01	41	<4	*		
88.1	3672	Cascade	503	*	<5	0.09	17.3	166	1.85	<2	0.156	0.14	2	0.08	48	<0.01	<1	14	<5	<4	*	18	<10	<0.01	84	<4	*		
89.1	554	Dave's Dream	769	*	<5	1.44	0.5	181	>10	6	<0.01	0.36	26	0.82	556	0.39	20	<5	7	<4	*	108	<10	0.17	264	<4	*		
89.1	555	Dave's Dream	1202	*	<5	0.72	<0.2	19	3.01	<2	0.020	0.48	10	0.71	321	0.03	5	<5	<5	<4	*	20	<10	0.12	73	<4	*		
89.1	556	Dave's Dream	1301	*	<5	0.95	0.3	28	3.92	<2	0.022	0.57	12	0.90	384	0.04	7	<5	<5	<4	*	23	<10	0.14	98	<4	*		
89.1	557	Dave's Dream	262	*	<5	0.89	1.0	166	>10	20	0.012	0.15	39	0.43	614	0.13	70	<5	<5	31	*	39	18	0.12	894	12	*		
89.1	558	Dave's Dream	863	*	<5	1.27	0.4	114	7.85	4	0.011	0.37	21	0.84	501	0.23	15	<5	7	<4	*	64	<10	0.16	192	<4	*		
89.1	559	Dave's Dream	1161	*	<5	0.79	0.3	28	4.70	3	0.022	0.44	12	0.68	349	0.05	9	<5	<5	<4	*	22	<10	0.11	132	8	*		
89.1	560	Dave's Dream	294	*	<5	0.69	1.0	147	>10	19	<0.01	0.15	25	0.34	526	0.10	68	<5	<5	17	*	37	15	0.10	864	<4	*		
89.1	561	Dave's Dream	1407	*	<5	0.64	<0.2	25	3.42	<2	0.019	0.59	10	0.81	365	0.04	6	<5	<5	<4	*	19	<10	0.17	83	<4	*		
89.1	562	Dave's Dream	604	*	<5	1.09	0.7	191	>10	12	0.015	0.24	31	0.54	548	0.27	41	<5	5	<4	*	75	<10	0.13	515	<4	*		
89.1	563	Dave's Dream	795	*	<5	1.36	0.4	192	9.61	6	0.016	0.37	25	0.78	528	0.39	18	<5	7	<4	*	107	<10	0.15	237	<4	*		
89.1	564	Dave's Dream	1392	*	<5	0.68	<0.2	25	3.60	<2	0.019	0.80	9	1.07	435	0.03	6	<5	<5	<4	*	21	<10	0.22	83	4	*		
89.1	565	Dave's Dream	370	*	<5	0.87	0.9	141	>10	17	0.140	0.17	23	0.40	506	0.14	59	<5	<5	17	*	47	12	0.10	727	<4	*		
89.1	566	Dave's Dream	1079	*	<5	0.75	<0.2	24	3.33	<2	0.023	0.39	11	0.64	322	0.05	6	<5	<5	<4	*	22	<10	0.11	84	<4	*		
89.1	2868	Dave's Dream	307	*	<5	1.19	0.9	132	>10	16	0.011	0.19	37	0.59	611	0.16	54	<5	6	15	*	45	13	0.12	693	<4	*		
89.1	2869	Dave's Dream	1204	*	<5	0.68	<0.2	22	2.75	<2	<0.01	0.47	9	0.69	320	0.04	4	<5	<5	<4	*	19	<10	0.12	67	<4	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
89.1	2870	Dave's Dream	SS					390		0.2		13		4		58		2	9	16	0.64	<5
89.1	2871	Dave's Dream	SS					<5		<0.1		11		3		46		<1	8	9	0.86	9
90.1	84	Mary Moose	SS					8		<0.1		58		12		84		1	33	14	1.50	8
90.1	85	Mary Moose	SS					<5		<0.1		35		10		100		1	30	12	1.30	8
90.1	247	Mary Moose	SS					<5		<0.1		37		9		66		<1	31	12	1.32	5
90.1	248	Mary Moose	SS					29		<0.1		42		10		63		<1	30	12	1.31	5
91.1	2856	Buck Bar	PC		1 pan			70		<0.2		5		14		54		<1	12	15	0.55	<5
91.1	2857	Buck Bar	PC		2 pans			54		<0.2		7		9		55		<1	10	18	0.23	<5
91.1	2858	Buck Bar	PC		2 pans			36		<0.2		7		4		55		<1	11	17	0.41	<5
91.2	86	Buck Bar	SS					9		0.2		43		9		61		<1	30	11	1.22	<5
91.2	87	Buck Bar	SS					<5		0.2		48		11		66		1	32	12	1.25	<5
91.2	249	Buck Bar	SS					7		<0.1		48		10		65		1	30	12	1.28	5
91.2	250	Buck Bar	SS					5		<0.1		45		11		66		<1	32	13	1.32	6
91.3	88	Buck Bar	SS					<5		0.2		41		9		66		<1	29	12	1.26	6
91.3	89	Buck Bar	SS					<5		0.3		47		12		73		1	30	13	1.38	6
91.3	251	Buck Bar	SS					80		<0.1		33		11		76		<1	28	14	1.01	<5
91.3	252	Buck Bar	SS					15		<0.1		40		10		65		<1	30	12	1.28	<5
91.4	253	Buck Bar	SS					<5		0.2		40		8		67		<1	28	11	1.29	<5
92.1	2859	Andrew Creek	PC					1058		<0.2		24		7		72		3	19	10	1.89	12
92.1	3804	Andrew Creek	SS					6		<0.2		38		6		81		2	18	14	1.71	12
92.1	3805	Andrew Creek	SS					<5		<0.2		28		3		37		1	26	12	1.36	<5
92.2	9691	Andrew Creek	SS					12		<0.1		58		41		169		<1	15	16	2.00	9
92.3	145	Andrew Creek	R	G		OC	Gneiss w/ dissem po	15		0.5		45		13		151		10	26	14	1.75	<5
92.3	146	Andrew Creek	R	G		FL	Qz vn	0.822	*	16.2		24		49		16		4	9	<1	0.06	102
92.3	361	Andrew Creek	SS					34		<0.1		15		19		116		3	13	8	1.27	30
92.3	362	Andrew Creek	SS					13		0.2		24		40		121		4	14	26	1.59	115
92.3	363	Andrew Creek	SS					493		0.3		42		64		155		4	17	14	1.81	75
92.3	364	Andrew Creek	SS					15		0.3		37		51		102		3	13	9	1.70	54
92.3	365	Andrew Creek	SS					27		0.3		30		40		103		3	14	10	1.85	50
92.3	366	Andrew Creek	SS					335		0.3		29		52		118		3	14	11	1.88	49
92.3	367	Andrew Creek	SS					117		0.3		35		52		110		3	17	13	2.06	82
92.3	368	Andrew Creek	R	G	0.7	RC	Fest qz vn	<5		<0.1		7		13		21		<1	5	<1	0.36	<5
92.3	2848	Andrew Creek	SS					33		<0.2		54		59		104		3	19	14	2.32	70
92.3	2849	Andrew Creek	R	S		FL	Qz	141		0.9		6		9		4		<1	5	<1	0.04	220
92.3	2850	Andrew Creek	R	Rep		FL	Qz	1992		2.1		13		31		12		9	14	<1	0.37	2741
92.3	2851	Andrew Creek	SS					24		0.3		91		47		135		2	34	22	2.30	89
92.3	2852	Andrew Creek	SS					16		0.4		60		23		132		4	33	19	1.98	41
92.3	2853	Andrew Creek	SS					23		0.5		58		34		116		4	37	18	1.85	35
92.3	3750	Andrew Creek	R	G		FL	Qz w/ minor py	137		1.0		26		17		13		3	6	<1	0.53	169
92.3	3800	Andrew Creek	R	G		FL	Fest qz w/ fg py	693		0.5		15		3		10		2	9	2	0.54	349
92.3	3801	Andrew Creek	R	G		RC	Br qz vn w/ fg sulf	480		1.1		14		11		10		7	11	2	0.23	298
92.3	3802	Andrew Creek	SS					21		0.3		68		21		126		3	37	25	2.31	54
92.3	3803	Andrew Creek	SS					54		0.8		40		26		112		2	26	16	1.57	91
92.3	9688	Andrew Creek	R	RC		FL	Vuggy qz	558		0.8		5		12		50		3	8	<1	0.28	80
92.3	9689	Andrew Creek	R	RC		FL	Vuggy qz	162		0.4		5		10		16		3	9	<1	0.23	84
92.3	9690	Andrew Creek	R	RC		FL	Qz vn	301		0.2		6		5		11		3	8	<1	0.13	212
92.4	369	Andrew Creek	SS					6		0.5		64		67		245		4	32	15	1.78	37
92.4	370	Andrew Creek	SS					18		0.7		87		133		318		4	27	15	1.69	49
92.4	9692	Andrew Creek	SS					52		0.5		63		107		258		3	31	19	1.82	129

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
89.1	2870	Dave's Dream	385	*	<5	0.85	0.7	112	>10	15	0.014	0.14	25	0.41	500	0.11	54	<5	<5	11	*	33	12	0.10	682	<4	*		
89.1	2871	Dave's Dream	1143	*	<5	0.72	1.2	23	3.10	<2	0.033	0.37	9	0.60	307	0.05	6	<5	<5	<4	*	23	<10	0.11	80	<4	*		
90.1	84	Mary Moose	196		<5	1.77	0.4	35	3.58	4	0.032	0.15	10	1.13	621	0.06	3	<5	5	<20		59	<10	0.10	68	<20			
90.1	85	Mary Moose	141		<5	0.82	0.3	36	3.51	3	0.060	0.10	9	0.92	510	0.04	4	<5	<5	<20		37	<10	0.08	70	<20			
90.1	247	Mary Moose	91		<5	0.48	0.3	37	4.05	3	0.023	0.08	11	0.85	512	0.03	4	<5	<5	<20		29	<10	0.10	86	<20			
90.1	248	Mary Moose	140		<5	1.26	0.3	35	3.66	3	0.025	0.10	9	1.02	501	0.05	3	<5	<5	<20		45	<10	0.09	74	<20			
91.1	2856	Buck Bar	23		<5	0.93	<0.2	148	>10	9	0.032	0.08	92	0.44	715	0.09	<1	<5	<5	<20		18	10	0.16	810	<20			
91.1	2857	Buck Bar	172	*	<5	0.46	<0.2	124	>10	9	<0.01	0.03	48	0.15	614	0.03	<1	<5	<5	<20		8	<10	0.12	1001	<20			
91.1	2858	Buck Bar	269	*	<5	0.69	<0.2	132	>10	10	0.014	0.06	65	0.30	689	0.06	<1	<5	<5	<20		14	11	0.14	941	<20			
91.2	86	Buck Bar	148		<5	2.06	0.2	32	2.98	3	0.025	0.10	8	1.02	452	0.06	2	<5	<5	<20		60	<10	0.09	60	<20			
91.2	87	Buck Bar	146		<5	1.68	0.3	35	3.27	3	0.029	0.11	9	1.04	497	0.06	3	<5	<5	<20		51	<10	0.09	66	<20			
91.2	249	Buck Bar	159		<5	2.14	0.3	36	3.46	3	0.020	0.10	9	1.09	515	0.05	2	<5	<5	<20		59	<10	0.10	71	<20			
91.2	250	Buck Bar	170		<5	1.99	0.3	38	3.63	3	0.019	0.11	9	1.08	518	0.05	3	<5	<5	<20		62	<10	0.10	74	<20			
91.3	88	Buck Bar	159		<5	1.84	0.3	34	3.62	3	0.024	0.09	9	1.05	508	0.06	3	<5	<5	<20		56	<10	0.09	73	<20			
91.3	89	Buck Bar	185		<5	1.90	0.3	34	3.82	3	0.026	0.11	9	1.11	564	0.06	3	<5	<5	<20		60	<10	0.10	76	<20			
91.3	251	Buck Bar	107		<5	1.41	0.3	65	15.38	4	0.019	0.07	14	0.89	550	0.04	9	<5	<5	<20		44	<10	0.11	251	<20			
91.3	252	Buck Bar	163		<5	1.75	0.3	42	4.39	3	0.034	0.09	9	1.06	510	0.05	4	<5	<5	<20		56	<10	0.10	93	<20			
91.4	253	Buck Bar	161		<5	1.66	0.3	29	3.19	3	0.024	0.10	8	1.01	502	0.06	3	<5	<5	<20		54	<10	0.09	62	<20			
92.1	2859	Andrew Creek	649	*	<5	1.58	0.3	251	6.32	4	0.010	0.21	18	1.01	1166	0.18	<1	<5	10	<4	*	35	<10	0.22	156	58	*		
92.1	3804	Andrew Creek	878	*	<5	0.66	0.5	26	3.27	<2	0.063	0.31	5	1.04	504	0.05	5	<5	6	<4	*	21	<10	0.15	72	<4	*		
92.1	3805	Andrew Creek	695	*	<5	0.68	<0.2	42	2.34	<2	0.014	0.19	3	1.04	320	0.03	4	<5	<5	<4	*	15	<10	0.12	43	<4	*		
92.2	9691	Andrew Creek	1189	*	<5	0.76	0.9	31	4.37	5	0.081	0.73	5	1.56	718	0.06	8	<5	6	<4	*	15	<10	0.21	98	6	*		
92.3	145	Andrew Creek	56		<5	0.36	<0.2	151	3.78	<2	<0.01	0.40	4	1.14	432	0.07	6	<5	11	<20		14	<10	0.20	111	<20			
92.3	146	Andrew Creek	6		<5	<0.01	<0.2	281	0.30	<2	0.013	0.03	<1	<0.01	26	<0.01	<1	7	<5	<20		<1	<10	<0.01	3	<20			
92.3	361	Andrew Creek	821	*	<5	0.81	0.6	100	2.98	4	0.041	0.22	10	0.77	479	0.09	7	<5	6	<4	*	16	<10	0.13	79	4	*		
92.3	362	Andrew Creek	676	*	<5	0.58	0.4	27	4.10	4	0.071	0.21	8	0.49	3907	0.24	6	<5	<5	<4	*	16	<10	0.08	58	<4	*		
92.3	363	Andrew Creek	857	*	<5	0.56	0.7	43	3.29	5	0.063	0.32	9	0.77	986	0.09	7	<5	<5	<4	*	15	<10	0.12	77	12	*		
92.3	364	Andrew Creek	715	*	<5	0.75	0.3	34	2.61	5	0.050	0.27	10	0.66	366	0.09	6	<5	<5	<4	*	18	<10	0.10	61	14	*		
92.3	365	Andrew Creek	867	*	<5	0.55	<0.2	39	2.63	6	0.036	0.29	8	0.75	391	0.15	7	<5	<5	<4	*	14	<10	0.12	67	4	*		
92.3	366	Andrew Creek	839	*	<5	0.54	0.3	39	2.76	6	0.046	0.32	10	0.81	424	0.13	7	<5	<5	<4	*	13	<10	0.13	71	6	*		
92.3	367	Andrew Creek	831	*	<5	0.62	0.3	44	3.22	7	0.053	0.32	9	0.80	540	0.18	8	<5	<5	<4	*	17	<10	0.13	76	9	*		
92.3	368	Andrew Creek	306	*	<5	0.03	<0.2	111	0.25	<2	<0.01	0.15	<1	0.02	52	0.09	<1	<5	<5	<4	*	5	<10	<0.01	<1	<4	*		
92.3	2848	Andrew Creek	716	*	<5	0.87	0.5	39	2.92	<2	0.045	0.28	14	0.82	533	0.03	7	<5	<5	<4	*	22	<10	0.14	65	8	*		
92.3	2849	Andrew Creek	<10	*	<5	<0.01	<0.2	294	0.35	<2	<0.01	0.02	<1	<0.01	30	0.01	<1	<5	<5	<4	*	<1	<10	<0.01	<1	<4	*		
92.3	2850	Andrew Creek	25	*	<5	0.19	<0.2	297	0.84	<2	<0.01	0.20	2	0.03	37	0.01	<1	8	<5	<4	*	10	<10	<0.01	10	<4	*		
92.3	2851	Andrew Creek	914	*	<5	1.15	1.0	58	3.73	<2	0.069	0.53	13	1.12	845	0.06	7	<5	<5	<4	*	29	<10	0.16	84	5	*		
92.3	2852	Andrew Creek	1082	*	<5	0.99	0.9	37	3.97	<2	0.031	0.23	8	1.04	450	0.06	5	<5	6	<4	*	39	<10	0.13	91	<4	*		
92.3	2853	Andrew Creek	1186	*	<5	1.14	1.0	37	4.14	<2	0.021	0.21	7	1.05	384	0.07	5	<5	6	<4	*	41	<10	0.13	88	<4	*		
92.3	3750	Andrew Creek	67	*	<5	0.41	<0.2	277	0.58	<2	<0.01	0.28	2	0.05	45	0.01	<1	35	<5	<4	*	52	<10	<0.01	28	<4	*		
92.3	3800	Andrew Creek	207	*	<5	0.16	<0.2	192	1.04	<2	<0.01	0.26	5	0.04	30	<0.01	<1	12	<5	<4	*	9	<10	<0.01	7	6	*		
92.3	3801	Andrew Creek	131	*	<5	<0.01	<0.2	201	2.57	<2	0.016	0.14	1	<0.01	22	<0.01	<1	18	<5	<4	*	<1	<10	<0.01	5	13	*		
92.3	3802	Andrew Creek	749	*	<5	0.94	0.7	51	4.65	<2	0.042	0.19	6	1.46	619	0.06	6	<5	8	465	*	37	<10	0.18	105	<4	*		
92.3	3803	Andrew Creek	924	*	<5	0.55	0.6	35	3.52	<2	0.033	0.25	7	0.87	469	0.04	4	<5	<5	<4	*	20	<10	0.11	74	10	*		
92.3	9688	Andrew Creek	676	*	<5	0.07	0.3	182	0.34	<2	0.014	0.13	<1	0.02	33	0.05	<1	<5	<5	<4	*	10	<10	<0.01	2	<4	*		
92.3	9689	Andrew Creek	243	*	<5	0.03	0.4	217	0.39	<2	<0.01	0.13	<1	<0.01	41	0.02	<1	<5	<5	13	*	2	<10	<0.01	5	<4	*		
92.3	9690	Andrew Creek	71	*	<5	0.04	0.7	193	0.29	<2	<0.01	0.07	<1	<0.01	21	<0.01	<1	<5	<5	<4	*	4	<10	<0.01	6	<4	*		
92.4	369	Andrew Creek	1465	*	<5	0.56	1.2	40	4.10	5	0.050	0.28	13	1.07	589	0.09	8	<5	6	<4	*	20	<10	0.11	100	<4	*		
92.4	370	Andrew Creek	185		<5	0.67	1.3	43	3.25	5	0.073	0.33	56	0.79	676	0.32	6	<5	<5	<20		31	<10	0.09	70	<20			
92.4	9692	Andrew Creek	912	*	<5	0.67	0.9	46	4.08	5	0.054	0.44	17	0.89	841	0.16	7	<5	<5	<4	*	24	<10	0.11	80	14	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
92.4	9693	Andrew Creek	SS					31		0.5		58		51		183		3	28	15	1.89	106
92.5	371	Andrew Creek	SS					20		0.4		73		17		157		4	40	15	1.68	26
93.1	607	North Silver North	R	C	0.7	OC	Mn-oxide-stained marble w/ po	60		16.2		37		7611		1436		2	3	2	0.50	112
93.2	8848	North Silver North	R	C	4	OC	Marble w/ py, sl, gn	23		27.4		129		2893		16793		5	8	3	1.34	199
93.3	589	North Silver North	R	G	1	OC	Mn-oxide-stained marble w/ sl, gn	18		37.2		28		705		9583		<1	3	1	0.43	84
93.4	8834	North Silver North	R	S		OC	Fest gneiss w/ sl, gn	31		77.0		52		4716		4807		6	10	3	1.32	129
93.5	985	North Silver North	R	CC	1.5	OC	Sil gneiss w/ sl, gn	52		960.5		204		9.48	*	8590		8	19	9	0.76	311
93.6	587	North Silver North	R	C	0.3	OC	Qz w/ msv gn, sl	43		1072.0		488		22.90	*	3.80	*	5	9	7	0.89	83
93.7	588	North Silver North	R	C	0.5	OC	Fest sil sheared gneiss w/ sl, gn	8		206.0		232		3.61	*	2.60	*	5	14	11	0.67	29
93.8	9587	North Silver North	R	C	0.25	OC	Msv gn in fault	111		84.30	*	1104		48.61	*	2.86	*	1	9	5	0.32	38
93.9	9586	North Silver North	R	C	0.8	OC	Fault gouge w/ msv gn stringer & py	12		7.45	*	217		4.69	*	2.94	*	4	24	11	0.81	37
93.10	8832	North Silver North	R	C	5	OC	Fest gneiss w/ sl, gn	10		137.0		148		3161		9147		6	17	11	1.31	23
93.11	8833	North Silver North	R	C	7	OC	Fest gneiss w/ sl, gn	6		10.2		67		1463		2803		5	12	8	0.68	16
93.12	8829	North Silver North	R	S		TP	Fest gneiss w/ sl	9		2.2		83		1333		1582		4	30	13	2.34	6
93.13	8973	North Silver North	R		4	OC	Sil gneiss w/ sl, gn	<5		39.1		516		3.30	*	2.39	*	10	27	13	4.12	16
93.14	585	North Silver North	R	C	1	OC	Fest gossan w/ gn, sl	17		92.0		711		9.90	*	4.10	*	6	9	5	2.08	97
93.15	586	North Silver North	R	G	0.3	OC	Calcareous fest gneiss w/ sl, gn	62		22.3		184		9103		3.70	*	4	24	24	2.63	4300
93.16	8830	North Silver North	R	S		OC	Fest gneiss w/ sl	52		20.6		210		2438		10865		5	20	21	2.33	1511
93.17	125	North Silver North	R	C	3.3	OC	Shear zone w/ fault gouge, clay, & sulf	46		46.6		130		2451		5245		10	50	20	1.21	228
93.18	124	North Silver North	R	S	0.45	OC	Qz-sulf vn w/ sl, gn, cp, py, po	372		119.32	*	580		22.50	*	3.55	*	2	14	20	0.71	120
93.19	8831	North Silver North	R	C	4	OC	Gneiss & marble w/ gn, sl	129		1727.6		340		16.64	*	17359		8	39	16	1.19	29
93.20	126	North Silver North	R	C	0.2	OC	Qz-sulf vn w/ gn, sl, po	287		16.28	*	493		28.34	*	2.36	*	14	21	2	0.74	1372
93.21	601	North Silver North	R	C	0.1	OC	Ls, po, py cp, sl, & gn	32		728.8		216		5.16	*	6.40	*	3	7	3	1.31	21
93.22	599	North Silver North	R	Rep	9	TP	Mn oxide, fest ls w/ po, sl, gn	<5		9.1		42		1202		3225		52	95	5	1.20	43
93.22	600	North Silver North	R	S		OC	Ls w/ po, py, sl, gn	7		8.8		57		388		2595		56	103	8	1.96	93
93.23	8842	North Silver North	R	SC	5@.5	OC	Marble w/ py, sl, gn	22		18.4		43		6220		2814		3	11	4	1.53	70
93.23	8843	North Silver North	R	S		OC	Marble w/ py, gn	18		15.2		144		4613		438		4	4	2	0.62	105
93.24	597	North Silver North	R	C	6	TP	Mn oxide & fest ls w/ py, po, sl, gn	28		58.0		48		5114		12758		4	5	2	0.46	40
93.24	598	North Silver North	R	S		MD	Ls w/ Mn oxide, fest, py, po, gl, gn	21		32.5		47		6970		2523		5	6	<1	0.29	30
93.25	8841	North Silver North	R	S		OC	Marble w/ py, sl, gn	29		50.0		73		1718		9779		39	78	8	1.85	369
93.26	9588	North Silver North	R	S		TP	Sil contact zone w/ dissem sulf	40		34.9		62		5090		8490		1	5	<1	0.35	67
93.27	8840	North Silver North	R	SC	7@.25	OC	Marble & gneiss w/ sl, gn	12		23.2		43		3510		8623		44	86	7	1.57	113
93.28	436	North Silver North	R	G		TP	Fest gneiss w/ py	<5		0.4		135		10		88		4	66	45	2.78	<5
94.1	122	North Silver West	R	C	1.4	TP	Qz-sulf zone w/ gossan, sl, gn	408		79.46	*	295		11.00	*	9.47	*	<1	3	7	0.95	80
94.1	123	North Silver West	R	G		MD	Msv gn, sl	107		33.03	*	283		9.71	*	12.43	*	1	4	10	1.24	47
94.1	431	North Silver West	R	C	2.75	TP	Fest zone w/ sulf	10		31.3		97		1795		2734		4	8	6	1.76	96
94.1	432	North Silver West	R	C	0.5	TP	Fest shear zone w/ sl, gn	26		180.1		92		9048		1.67	*	2	6	6	1.96	6
94.2	9584	North Silver West	R	Rep	4.9	TP	Gossan in fault br w/ sulf	33		4.84	*	379		6843		1.84	*	2	8	9	1.39	63
94.2	9585	North Silver West	R	S		TP	Msv gn in fault	86		15.54	*	904		11.36	*	8.09	*	<1	6	19	0.68	123
94.3	435	North Silver West	R	C	4	TP	Fest, sheared gneiss w/ sparse sulf	9		19.7		88		1678		1268		3	7	12	2.07	10
94.3	8693	North Silver West	R	C	0.5	TP	Shear zone w/ gn & sl in gneiss	732		2735.8		232		33.47	*	9.81	*	2	4	5	0.74	57
94.4	434	North Silver West	R	C	0.5	OC	Fest, sil gneiss w/ dissem py	<5		3.0		76		42		87		5	9	3	1.55	<5
94.5	433	North Silver West	R	C	1.5	TP	Fest gneiss w/ dissem py	67		9.6		47		434		145		12	17	4	0.65	105
95.1	438	North Silver Whistlepig Adit	R	G	0.3	RC	Fest, sil band w/ po, py, sl, gn	<5		93.4		954		5098		1.91	*	<1	12	29	0.36	65
95.2	439	North Silver Whistlepig Adit	R	G	0.2	RC	Fest, sil gneiss w/ po, py, sl, gn	46		212.9		1052		2.45	*	11	*	2	14	41	0.50	375
95.3	121	North Silver Whistlepig Adit	R	C	0.4	OC	Sil shear zone w/ gn	1165		517.62	*	205		39.75	*	3764		<1	1	4	0.15	1534
95.4	120	North Silver Whistlepig Adit	R	Rep	1	OC	Sil band w/ sulf	4345		11.5		31		778		391		3	4	3	1.60	770
95.5	437	North Silver Whistlepig Adit	R	C	2.4	UW	Fest gneiss w/ qz bands & sulf	35		5.6		29		379		492		11	15	3	1.07	123
95.5	2640	North Silver Whistlepig Adit	R	G		MD	Sil fel dike w/ sulf & mo	10		10.4		520		1200		1900		74	11	4	0.45	94

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
92.4	9693	Andrew Creek	952	*	<5	0.59	0.4	42	3.85	5	0.043	0.32	11	0.83	585	0.07	7	<5	5	<4	*	20	<10	0.12	87	8	*		
92.5	371	Andrew Creek	1334	*	<5	1.17	1.2	37	4.27	4	0.027	0.21	7	1.03	322	0.10	8	<5	<5	<4	*	41	<10	0.12	103	<4	*		
93.1	607	North Silver North	12	*	<5	1.99	9.6	22	>10	<2	0.024	0.06	2	0.98	>20000	0.01	<1	<5	<5	23	*	46	<10	0.02	22	<4	*		
93.2	8848	North Silver North	<10	*	<5	6.12	136.2	53	>10	<2	0.041	0.05	4	1.23	>20000	<0.01	<1	7	<5	21	*	198	<10	<0.01	50	<4	*		
93.3	589	North Silver North	<10	*	<5	0.60	55.1	37	>10	<2	0.026	<0.01	2	0.56	>20000	<0.01	<1	<5	<5	16	*	16	<10	<0.01	16	<4	*		
93.4	8834	North Silver North	<10	*	<5	8.11	28.3	69	>10	<2	0.022	0.04	3	1.17	>20000	<0.01	<1	7	<5	22	*	177	<10	<0.01	32	<4	*		
93.5	985	North Silver North	450	*	<5	0.13	70.4	99	7.21	<2	0.142	0.33	5	0.11	718	<0.01	1	181	<5	1350	*	4	13	<0.01	39	7	*		
93.6	587	North Silver North	36	*	<5	>10	257.6	32	7.08	<2	0.117	0.06	4	0.68	13475	<0.01	3	225	<5	143	*	256	17	<0.01	46	<4	*		
93.7	588	North Silver North	394	*	<5	6.94	164.7	35	9.14	<2	0.066	0.20	7	0.56	12146	<0.01	<1	59	<5	56	*	166	15	<0.01	22	<4	*		
93.8	9587	North Silver North	<10	*	6	2.97	284.8	31	8.92	<2	0.124	0.03	1	0.30	6290	<0.01	<1	887	<5	264	*	63	12	<0.01	5	<4	*		
93.9	9586	North Silver North	280	*	8	8.99	221.4	54	7.05	<2	0.076	0.14	7	0.62	14801	<0.01	3	61	<5	70	*	243	<10	<0.01	17	<4	*		
93.10	8832	North Silver North	606	*	<5	5.32	64.4	78	6.95	<2	0.070	0.17	4	0.71	7793	0.02	3	5	7	25	*	129	<10	<0.01	58	<4	*		
93.11	8833	North Silver North	613	*	<5	1.34	20.9	133	4.76	<2	<0.01	0.27	6	0.28	3484	<0.01	<1	<5	<5	12	*	39	<10	<0.01	18	<4	*		
93.12	8829	North Silver North	858	*	<5	3.72	12.7	161	4.91	<2	0.019	0.15	3	1.06	5010	0.05	5	<5	7	<4	*	102	<10	0.02	82	<4	*		
93.13	8973	North Silver North	104	*	<5	6.18	176.6	72	>10	<2	0.045	0.10	6	2.04	15756	<0.01	12	13	6	33	*	74	43	0.04	197	<4	*		
93.14	585	North Silver North	<10	*	<5	4.22	245.0	35	>10	<2	0.053	0.03	5	1.01	12392	<0.01	5	55	<5	41	*	71	19	0.01	101	<4	*		
93.15	586	North Silver North	<10	*	<5	8.25	278.9	59	>10	<2	0.050	0.02	4	1.32	14206	<0.01	5	15	11	17	*	122	13	<0.01	90	<4	*		
93.16	8830	North Silver North	28	*	<5	6.67	81.0	85	>10	<2	0.030	0.05	3	1.26	10113	<0.01	5	7	10	8	*	161	<10	<0.01	97	<4	*		
93.17	125	North Silver North	433	*	<5	0.26	53.5	147	5.63	<2	0.055	0.20	7	0.39	6521	<0.01	3	9	14	9	*	9	<10	<0.01	65	<4	*		
93.18	124	North Silver North	<10	*	<5	1.75	291.7	72	17.75	<2	1.136	0.03	1	0.70	4351	<0.01	<1	176	<5	482	*	50	<10	<0.01	21	<4	*		
93.19	8831	North Silver North	121	*	<5	3.02	129.1	96	7.13	<2	0.352	0.13	4	1.00	7535	<0.01	3	210	7	258	*	72	<10	<0.01	60	<4	*		
93.20	126	North Silver North	<10	*	<5	0.79	228.0	100	8.14	<2	0.140	0.04	3	0.44	5142	<0.01	8	309	<5	162	*	47	<10	<0.01	171	<4	*		
93.21	601	North Silver North	<10	*	<5	0.86	364.2	25	>10	<2	0.324	0.03	3	0.89	>20000	<0.01	<1	78	<5	124	*	10	16	<0.01	27	<4	*		
93.22	599	North Silver North	225	*	<5	9.14	23.0	103	4.63	<2	0.016	0.15	6	1.01	8683	<0.01	7	<5	<5	<4	*	182	<10	<0.01	95	<4	*		
93.22	600	North Silver North	158	*	<5	6.36	14.6	88	>10	<2	0.016	0.10	7	0.97	10864	<0.01	7	<5	<5	8	*	126	<10	<0.01	109	<4	*		
93.23	8842	North Silver North	<10	*	<5	2.57	17.6	72	>10	<2	0.020	0.04	3	1.54	>20000	<0.01	1	<5	<5	8	*	46	<10	<0.01	45	<4	*		
93.23	8843	North Silver North	<10	*	<5	3.21	3.8	40	>10	<2	0.016	<0.01	2	0.91	>20000	<0.01	<1	6	<5	11	*	55	<10	<0.01	21	<4	*		
93.24	597	North Silver North	66	*	<5	8.57	89.1	31	>10	<2	0.109	<0.01	3	1.78	>20000	<0.01	<1	5	<5	21	*	117	<10	<0.01	13	<4	*		
93.24	598	North Silver North	<10	*	<5	4.42	16.2	54	>10	<2	0.020	<0.01	3	0.92	>20000	<0.01	<1	<5	<5	16	*	67	<10	<0.01	11	<4	*		
93.25	8841	North Silver North	<10	*	<5	0.21	70.5	69	>10	<2	0.050	<0.01	8	0.73	11433	<0.01	7	8	<5	13	*	4	13	<0.01	133	<4	*		
93.26	9588	North Silver North	<10	*	9	3.18	53.0	36	27.46	<2	0.021	0.03	<1	0.77	>20000	<0.01	<1	<5	<5	117	*	57	<10	<0.01	<1	<4	*		
93.27	8840	North Silver North	133	*	<5	6.05	57.6	87	>10	<2	0.019	0.12	8	1.54	17004	<0.01	7	10	5	18	*	145	<10	<0.01	115	<4	*		
93.28	436	North Silver North	8475	*	<5	0.78	0.6	124	6.09	5	<0.01	0.47	3	1.88	298	0.17	<1	<5	35	5	*	18	<10	0.19	297	<4	*		
94.1	122	North Silver West	<10	*	<5	0.02	623.9	60	13.60	<2	0.303	0.08	1	0.44	5087	<0.01	<1	167	<5	370	*	5	18	<0.01	14	<4	*		
94.1	123	North Silver West	<10	*	<5	0.21	903.1	87	8.07	<2	0.282	0.05	<1	0.58	5839	<0.01	<1	105	<5	165	*	2	24	<0.01	17	<4	*		
94.1	431	North Silver West	161	*	<5	0.03	21.0	97	8.20	3	0.052	0.18	5	0.69	7598	<0.01	<1	<5	<5	34	*	4	<10	<0.01	27	<4	*		
94.1	432	North Silver West	77	*	<5	0.03	197.7	108	>10	4	0.117	0.17	5	0.58	6802	0.01	<1	13	<5	38	*	3	19	<0.01	39	<4	*		
94.2	9584	North Silver West	61	*	<5	0.03	124.8	131	13.25	<2	0.077	0.12	2	0.62	3506	<0.01	<1	11	<5	47	*	1	<10	<0.01	12	<4	*		
94.2	9585	North Silver West	<10	*	7	0.08	499.7	52	21.67	<2	0.168	0.02	<1	0.37	2688	<0.01	<1	84	<5	73	*	1	<10	<0.01	1	<4	*		
94.3	435	North Silver West	558	*	<5	0.09	9.5	67	7.00	4	0.016	0.27	7	1.04	5925	<0.01	<1	<5	6	50	*	4	<10	<0.01	52	6	*		
94.3	8693	North Silver West	<10	*	<5	<0.01	838.1	35	9.38	<2	0.188	<0.01	3	0.41	6308	<0.01	<1	558	<5	279	*	4	52	<0.01	17	<4	*		
94.4	434	North Silver West	1001	*	<5	0.28	0.5	162	6.24	4	<0.01	0.38	4	0.56	732	0.05	<1	<5	6	<4	*	10	<10	0.08	108	<4	*		
94.5	433	North Silver West	295	*	<5	0.06	1.1	152	4.05	4	0.011	0.29	5	0.10	548	<0.01	<1	6	<5	72	*	5	<10	<0.01	28	<4	*		
95.1	438	North Silver Whistlepig Adit	44	*	<5	1.40	98.7	27	>10	<2	0.070	0.03	2	0.23	2221	<0.01	<1	<5	<5	47	*	13	19	<0.01	17	<4	*		
95.2	439	North Silver Whistlepig Adit	<10	*	<5	0.34	594.2	52	>10	<2	0.208	0.06	2	0.22	1997	<0.01	<1	37	<5	178	*	8	40	<0.01	13	<4	*		
95.3	121	North Silver Whistlepig Adit	<10	*	<5	0.01	32.3	63	3.36	<2	1.159	0.08	1	0.02	92	<0.01	<1	548	<5	1497	*	2	<10	<0.01	2	<4	*		
95.4	120	North Silver Whistlepig Adit	206	*	<5	0.89	6.7	127	2.68	14	<0.01	0.70	5	0.20	225	<0.01	2	8	<5	32	*	6	<10	<0.01	36	16	*		
95.5	437	North Silver Whistlepig Adit	281	*	<5	0.76	2.5	145	1.72	7	0.013	0.44	2	0.14	369	<0.01	<1	<5	<5	17	*	4	<10	<0.01	30	<4	*		
95.5	2640	North Silver Whistlepig Adit	30		<2	0.15	10.5	265	1.99	<10	0.030	0.10	<10	0.16	260	<.01		<2	2			4		<.01	48	<10			

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
95.5	8694	North Silver Whistlepig Adit	R	C	3.6	OC	Shear w/ po, qz, & fluorite-filled vugs in gneiss	33		11.9		25		954		399		4	10	3	1.43	100
95.5	8695	North Silver Whistlepig Adit	R	S		OC	Fluorite- & qz-filled vug	<5		1.4		9		87		54		2	2	<1	0.67	5
95.6	2641	North Silver Whistlepig Adit	R	S	0.2	OC	Mo & py blebs in sil host	35		7.5		46		3050		280		10	7	5	0.56	>10000
95.7	8696	North Silver Whistlepig Adit	R	Rep	3	OC	Zone of alt gneiss w/ cg gn	<5		42.1		130		3475		1640		2	8	7	3.03	6
95.8	430	North Silver Whistlepig Adit	R	G	0.3	RC	Fest, vuggy qz w/ blebs of gn	14		120.4		145		2158		377		<1	5	<1	0.59	38
96.1	144	AMAX Molybdenum	R	G	0.2	RC	Bt granite w/ mo in fractures	7		0.3		20		23		97		5392	12	2	1.25	<5
97.1	427	Northeast Cliffs	R	G	2	RC	Fest rhyolite	<5		1.1		112		126		1663		<1	8	6	2.22	5
97.2	419	Northeast Cliffs	R	G	1	OC	Fest, sil metaseds & metavolc w/ sulf	<5		1.3		838		36		9559		<1	12	18	3.35	<5
97.2	2834	Northeast Cliffs	R	G		OC	Rhyolite w/ py	9		0.5		219		36		1569		4	21	12	4.86	6
97.3	418	Northeast Cliffs	R	G	0.5	RC	Sil band w/ fg dissem sulf	<5		8.3		980		436		3959		15	38	23	3.45	18
98.1	101	Groundhog Basin	R	G		RC	Fest granite w/ sl, gn, po	8		12.4		146		8425		5849		2	3	<1	0.58	45
98.1	102	Groundhog Basin	R	G		RC	Fest granite w/ sl, gn, po	<5		6.3		188		4726		1.30	*	2	2	<1	0.59	33
98.1	103	Groundhog Basin	R	G		RC	Fest granite w/ sl, gn, po	<5		8.5		199		5240		7231		2	2	1	0.86	<5
98.2	99	Groundhog Basin	R	G	0.4	MD	Msv po, sl, gn, cp	16		7.0		872		152		16.03	*	<1	9	26	1.92	1487
98.2	265	Groundhog Basin	R	G		MD	Msv sulf zone	66		6.40	*	1205		5.91	*	4.10	*	3	25	17	1.16	428
98.2	2610	Groundhog Basin	R	S		MD	Sil bands w/ po, py, sl, gn	20		4.85	*	1300		5.06	*	9.14	*	<10	17	13	1.65	310
98.2	8836	Groundhog Basin, Adit 1	R	S		MD	Msv sulf in gneiss	56		146.0		1217		4.83	*	7.90	*	2	26	49	1.19	>10000
98.2	8837	Groundhog Basin, Adit 1	R	Rep	3	UW	Msv sulf in gneiss	34		159.0		1285		2.72	*	12.90	*	3	17	24	1.89	9640
98.3	2639	Groundhog Basin	R	G		RC	Sl lens	15		82.0		900		1.83	*	20.80	*	2	7	34	0.57	202
98.4	595	Groundhog Basin	R	C	0.5	RC	Fest msv sulf w/ po, sl, gn, cp	83		867.0		867		26.82	*	17.22	*	<1	11	11	0.27	346
98.4	8838	Groundhog Basin	R	S		RC	Msv py	8		37.2		781		3298		13.10	*	2	9	13	0.71	904
98.5	100	Groundhog Basin	R	C	1.5	MD	Dissem sulf in metamorphosed country rock	14		1.8		115		59		4500		2	7	8	2.27	9
98.5	264	Groundhog Basin	R	Rep	2.2	UW	Msv sulf zone	14		1.90	*	3100		1926		8.90	*	<1	10	16	1.24	150
98.5	593	Groundhog Basin, Adit 2	R	G	0.4	UW	Msv sulf w/ 40% sl	<5		9.9		419		40		14.40	*	4	7	10	1.43	<5
98.5	2611	Groundhog Basin	R	S		UW	Sil volc w/ po, py, sl	<5		1.66	*	3400		2900		8.58	*	<10	13	18	0.72	12
98.6	2612	Groundhog Basin	R	Rep		OC	Msv sl, po, py	5		24.3		1500		400		5.10	*	10	7	22	1.01	>10000
98.7	98	Groundhog Basin	R	G		UW	Msv, fg po, gn, cp, sl	24		141.0		1772		10.57	*	7.70	*	<1	7	6	0.52	2508
98.8	263	Groundhog Basin	R	Rep		OC	Msv sulf zone	8		35.7		1185		368		12.30	*	<1	7	11	0.45	3930
98.9	615	Groundhog Basin, Cirque	R	C	3	OC	Granulite (green pyroxene) w/ sl, gn, py	11		23.0		951		1.20	*	3.40	*	2	14	36	0.79	<5
98.9	616	Groundhog Basin, Cirque	R	C	3	OC	Gossan & granulite w/ sl, gn, cp, py	22		44.4		1623		4.03	*	2.40	*	10	14	23	2.14	303
98.9	617	Groundhog Basin, Cirque	R	C	2.2	OC	Calc silicate granulite w/ sl, gn, cp, py	<5		20.1		269		2.34	*	6.80	*	2	4	46	0.80	16
98.10	618	Groundhog Basin, Cirque	R	Rep	1.5	OC	Fest sil gneiss w/ py, sl	13		20.2		344		7088		3.10	*	4	50	27	1.24	<5
98.11	8858	Groundhog Basin, Cirque	R	Rep		OC	Gneiss	8		0.9		92		54		494		23	24	16	5.13	190
98.12	8857	Groundhog Basin, Cirque	R	S		OC	Gneiss w cp	86		7.0		728		203		192		7	17	14	1.33	1377
98.13	626	Groundhog Basin, Cirque	R	C	1.8	OC	Granulite w/ sl, gn, py	7		0.2		16		57		3258		3	5	5	0.72	<5
98.13	629	Groundhog Basin, Cirque	R	C	1	OC	Sil band w/ py, sl, gn	88		48.4		7505		86		6042		21	13	39	1.71	5899
98.14	627	Groundhog Basin, Cirque	R	C	0.8	OC	Granulite w/ sl, gn, py	14		3.3		147		543		2.70	*	4	8	25	1.34	<5
98.15	628	Groundhog Basin, Cirque	R	C	1.8	OC	Calc-silicate granulite w/ sl, py	6		1.0		273		36		12204		5	12	21	1.08	<5
98.16	630	Groundhog Basin, Cirque	R	C	1.5	OC	Fest sil shear w/ py & gray sulf	9		1.3		46		284		601		8	8	5	4.50	52
98.16	631	Groundhog Basin, Cirque	R	G	1	OC	Fest sil rocks w/ gray sulf	<5		6.1		343		282		8287		9	35	13	2.69	6
98.17	8855	Groundhog Basin, Cirque	R	C	4	OC	Gneiss, granulite w/ sl, cp	31		8.7		2072		518		4.50	*	<1	6	39	0.96	<5
98.17	8856	Groundhog Basin, Cirque	R	SC	8@.25	TP	Gneiss w/ sl	<5		0.4		49		28		3610		3	4	5	1.04	5
99.1	127	Copper Zone	R	G		FL	Silica-rich fg volc w/ blebs of po, cp, sl	34		1.52	*	1896		2047		405		2	7	14	0.52	868
99.2	128	Copper Zone	R	G		RC	Msv sulf w/ po, sl, cp	299		42.1		2277		451		3.12	*	4	124	201	2.17	9
99.3	8989	Copper Zone	R	SC	18@1	OC	Fest gneiss w/ diss cp	8		8.2		682		45		3142		5	28	12	1.95	5
99.4	991	Copper Zone	R	SC	25@1	OC	Fest gneiss w/ dissem sl	<5		3.2		217		66		558		2	70	16	2.88	19
99.5	990	Copper Zone	R	SC	25@1	OC	Fest gneiss w/ dissem sl	9		3.8		288		98		1638		5	35	23	3.34	1293
99.6	992	Copper Zone	R	SC	20@1	OC	Fest gneiss	<5		2.3		155		48		456		5	43	20	3.68	7
99.7	8990	Copper Zone	R	SC	12@.5	OC	Fest gneiss w dissem cp	64		48.5		800		581		1870		6	64	36	4.73	24

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
95.5	8694	North Silver Whistlepig Adit	401	*	<5	0.71	3.0	150	2.25	7	<0.01	0.54	3	0.33	473	<0.01	<1	<5	<5	10	*	5	<10	<0.01	36	<4	*		
95.5	8695	North Silver Whistlepig Adit	<10	*	<5	>10	0.3	60	0.31	<2	<0.01	0.32	<1	0.08	97	0.37	<1	<5	<5	6	*	37	<10	<0.01	8	<4	*		
95.6	2641	North Silver Whistlepig Adit	70		<2	0.01	2.0	292	4.22	<10	0.010	0.28	<10	0.03	50	<.01		16	1			3		<.01	34	<10			
95.7	8696	North Silver Whistlepig Adit	1077	*	<5	0.16	22.4	61	>10	8	0.012	0.19	3	1.44	3451	0.02	<1	<5	10	117	*	4	12	0.01	121	7	*		
95.8	430	North Silver Whistlepig Adit	21	*	<5	0.02	1.4	180	3.37	3	0.106	0.04	1	0.32	733	<0.01	<1	16	<5	39	*	<1	<10	<0.01	15	<4	*		
96.1	144	AMAX Molybdenum	49	*	<5	0.76	0.2	168	2.04	<2	<0.01	0.40	59	0.25	175	0.10	4	<5	<5	4	*	9	<10	0.01	23	23	*		
97.1	427	Northeast Cliffs	927	*	<5	0.47	4.0	50	4.07	3	0.011	0.43	<1	0.63	705	0.11	5	<5	<5	119	*	31	<10	0.05	55	<4	*		
97.2	419	Northeast Cliffs	239	*	<5	1.34	51.9	48	9.50	8	0.015	0.14	<1	1.04	587	0.25	9	<5	<5	209	*	131	<10	0.09	107	<4	*		
97.2	2834	Northeast Cliffs	674	*	<5	2.24	9.0	71	5.08	5	<0.01	0.86	<1	1.17	832	0.51	10	<5	8	58	*	152	<10	0.12	109	<4	*		
97.3	418	Northeast Cliffs	253	*	<5	1.85	20.4	182	11.41	19	0.019	1.38	<1	1.37	2858	0.01	6	<5	8	1941	*	66	<10	0.04	80	19	*		
98.1	101	Groundhog Basin	68	*	<5	0.03	53.4	94	1.66	2	<0.01	0.40	4	<0.01	57	0.01	29	<5	<5	311	*	<1	<10	<0.01	<1	8	*		
98.1	102	Groundhog Basin	77	*	<5	0.01	109.7	55	4.00	<2	<0.01	0.38	17	<0.01	83	0.01	30	<5	<5	142	*	<1	<10	<0.01	<1	26			
98.1	103	Groundhog Basin	75	*	<5	0.24	60.9	78	2.74	4	<0.01	0.45	7	<0.01	46	0.05	50	<5	<5	108	*	2	<10	<0.01	<1	8	*		
98.2	99	Groundhog Basin	26	*	<5	0.19	1040.0	13	24.38	4	0.060	0.17	1	1.00	718	<0.01	<1	<5	<5	6115	*	2	14	0.02	34	326			
98.2	265	Groundhog Basin	411	*	<5	0.25	391.7	41	19.05	<2	0.107	0.32	2	0.58	521	0.02	<1	104	<5	1300	*	2	<10	0.05	59	59			
98.2	2610	Groundhog Basin	<10		4	0.24	>100.0	66	14.15	<10	0.050	0.84	<10	0.89	955	0.03		56	7			5		0.14	86	10			
98.2	8836	Groundhog Basin, Adit 1	251	*	<5	0.16	798.0	37	>10	<2	0.088	0.54	<1	0.58	736	0.02	<1	84	<5	10000	*	2	21	0.07	48	<4	*		
98.2	8837	Groundhog Basin, Adit 1	544	*	<5	0.93	1222.8	53	>10	<2	0.107	0.39	1	0.45	753	0.10	<1	36	<5	1176	*	36	18	0.05	37	<4	*		
98.3	2639	Groundhog Basin	10		64	0.01	>100.0	24	>15	10	0.340	0.17	<10	0.17	495	<.01		4	1			<1		0.01	9	<10			
98.4	595	Groundhog Basin	<10	*	<5	0.02	1367.3	4	>10	<2	0.115	0.09	<1	0.04	466	<0.01	<1	193	<5	531	*	<1	28	<0.01	8	<4	*		
98.4	8838	Groundhog Basin	51	*	24	0.05	946.7	10	>10	<2	0.043	0.12	<1	0.28	399	0.01	<1	6	<5	75	*	<1	25	0.02	27	<4	*		
98.5	100	Groundhog Basin	1109	*	31	1.77	27.6	43	4.40	<2	0.155	0.64	3	1.01	813	0.15	5	<5	6	290	*	45	<10	0.18	82	<4	*		
98.5	264	Groundhog Basin	499	*	133	0.33	714.7	16	21.84	<2	0.082	0.31	2	0.80	435	0.02	<1	<5	<5	481	*	7	13	0.08	36	144			
98.5	593	Groundhog Basin, Adit 2	128	*	<5	0.39	1037.7	47	>10	4	0.255	0.56	<1	0.86	422	0.05	<1	<5	<5	6488	*	12	12	0.06	30	<4	*		
98.5	2611	Groundhog Basin	<10		138	0.21	>100.0	27	>15	<10	0.240	0.14	<10	0.40	315	<.01		6	2			7		0.06	22	10			
98.6	2612	Groundhog Basin	10		74	0.06	>100.0	50	>15	<10	0.030	0.41	<10	0.19	165	<.01		6	1			4		0.01	11	130			
98.7	98	Groundhog Basin	90	*	<5	0.18	504.7	27	30.95	<2	0.229	0.26	1	0.13	456	<0.01	<1	55	<5	1604	*	5	<10	<0.01	12	126			
98.8	263	Groundhog Basin	<10	*	53	0.05	823.6	23	27.56	<2	0.036	0.17	<1	0.09	259	<0.01	<1	<5	<5	65	*	1	20	<0.01	5	223			
98.9	615	Groundhog Basin, Cirque	40	*	24	1.30	278.2	53	4.64	<2	0.012	0.06	2	0.15	655	0.02	<1	<5	<5	313	*	27	<10	0.08	12	<4	*		
98.9	616	Groundhog Basin, Cirque	360	*	9	0.74	144.5	45	>10	<2	0.039	0.45	9	0.57	991	<0.01	2	10	<5	2214	*	5	<10	<0.01	55	<4	*		
98.9	617	Groundhog Basin, Cirque	101	*	13	0.95	559.6	31	4.79	<2	0.015	0.17	3	0.24	1067	0.02	1	<5	<5	317	*	30	12	0.09	18	<4	*		
98.10	618	Groundhog Basin, Cirque	219	*	<5	0.29	217.0	112	8.50	<2	0.025	0.37	4	0.38	458	0.02	4	7	<5	148	*	11	<10	0.08	44	<4	*		
98.11	8858	Groundhog Basin, Cirque	596	*	<5	3.20	3.2	61	7.21	8	<0.01	2.34	9	3.30	925	0.06	7	<5	12	781	*	73	<10	0.09	100	15	*		
98.12	8857	Groundhog Basin, Cirque	29	*	5	8.41	5.5	130	>10	3	0.011	0.65	2	0.18	187	0.28	<1	6	<5	404	*	28	<10	0.02	18	<4	*		
98.13	626	Groundhog Basin, Cirque	27	*	<5	1.50	20.0	42	1.69	<2	<0.01	0.03	2	0.10	780	0.02	<1	<5	<5	272	*	32	<10	0.08	10	<4	*		
98.13	629	Groundhog Basin, Cirque	47	*	33	3.47	61.7	104	>10	3	0.016	0.53	3	0.53	229	0.01	2	<5	<5	1380	*	12	<10	<0.01	38	<4	*		
98.14	627	Groundhog Basin, Cirque	512	*	6	1.51	187.1	46	3.09	<2	0.013	0.13	2	0.51	995	0.06	2	<5	<5	365	*	35	<10	0.11	30	<4	*		
98.15	628	Groundhog Basin, Cirque	362	*	<5	0.98	83.6	49	2.92	<2	0.012	0.23	2	0.55	624	0.08	2	<5	<5	293	*	35	<10	0.10	37	<4	*		
98.16	630	Groundhog Basin, Cirque	1556	*	<5	5.06	5.0	67	3.58	13	<0.01	2.05	21	1.26	1160	0.24	7	<5	8	222	*	46	<10	0.07	84	4	*		
98.16	631	Groundhog Basin, Cirque	328	*	8	2.37	58.2	164	4.78	4	0.024	0.93	8	0.40	675	0.02	6	<5	6	942	*	143	<10	0.02	83	15	*		
98.17	8855	Groundhog Basin, Cirque	27	*	8	1.18	304.1	39	5.93	<2	0.010	0.11	4	0.25	1697	0.02	<1	<5	<5	973	*	23	14	0.07	17	<4	*		
98.17	8856	Groundhog Basin, Cirque	<10	*	<5	4.26	18.6	52	5.11	<2	<0.01	0.07	1	0.17	1925	0.02	<1	<5	<5	884	*	13	<10	0.06	23	32	*		
99.1	127	Copper Zone	2320	*	50	0.04	6.9	153	1.21	<2	<0.01	0.33	6	0.05	151	0.01	5	<5	<5	35	*	4	<10	<0.01	8	<4	*		
99.2	128	Copper Zone	106	*	431	0.30	225.1	78	31.70	<2	0.025	0.46	87	1.22	847	0.01	<1	<5	7	109	*	10	<10	0.02	83	<4	*		
99.3	8989	Copper Zone	901	*	8	0.30	27.6	129	6.11	11	0.015	0.98	10	1.06	544	0.02	7	<5	<5	198	*	6	<10	0.03	61	14	*		
99.4	991	Copper Zone	947	*	<5	0.61	3.3	185	4.93	10	0.012	1.11	12	1.41	959	0.04	8	<5	7	85	*	18	<10	0.09	94	8	*		
99.5	990	Copper Zone	1110	*	<5	1.12	17.6	64	6.02	13	<0.01	0.96	20	1.44	1386	0.06	12	<5	8	124	*	31	<10	0.07	133	20	*		
99.6	992	Copper Zone	1427	*	<5	1.45	2.3	64	6.21	9	<0.01	0.73	21	2.01	1248	0.10	12	<5	10	71	*	63	<10	0.10	152	16	*		
99.7	8990	Copper Zone	1001	*	141	1.51	12.7	139	9.80	17	0.016	1.23	16	2.04	1928	0.21	17	<5	16	114	*	74	13	0.16	202	14	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
99.8	9592	Copper Zone	R	S		TP	Sil contact w/ cp, po, sl	179		12.1		1088		59		282		2	8	6	0.95	9
99.8	9593	Copper Zone	R	C	0.45	OC	Sil contact w/ cp, py	10		19.2		658		1190		1.29	*	10	20	9	2.56	<5
99.8	9594	Copper Zone	R	C	0.7	OC	Sil contact w/ py, cp	17		14.4		1947		151		7808		8	65	95	1.59	7
99.8	9595	Copper Zone	R	C	0.5	OC	Sil contact w/ cp, py	30		2.09	*	7415		41		906		10	36	39	1.62	57
99.8	9596	Copper Zone	R	C	0.2	OC	Lens of cp & sl in gneiss	4580		16.91	*	7.39	*	225		5613		8	18	166	3.75	322
99.9	130	Copper Zone	R	C	1	OC	Sil, fest gneiss w/ cp in fractures	15		8.17	*	1.71	*	753		7077		5	64	73	2.55	63
99.9	131	Copper Zone	R	S	0.4	RC	Msv cp in sil gneiss	2812		16.07	*	8.08	*	234		6980		3	122	310	0.74	171
99.9	132	Copper Zone	R	S	0.05	RC	Band of sl, gn	111		30.8		3204		164		2.51	*	4	7	26	0.86	>10000
99.9	133	Copper Zone	R	C	0.5	OC	Gossan w/ cp	55		19.65	*	2.24	*	1.71	*	2.65	*	<1	63	495	5.14	1195
100.1	428	South Silver	R	G	0.4	OC	Qz vn w/ sulf	14		0.6		29		28		41		12	5	2	0.76	70
100.2	8690	South Silver	R	Rep	10	OC	Qz vn in gneiss	<5		1.0		14		11		25		13	12	<1	0.59	89
100.3	8691	South Silver	R	S		OC	Fractured, fest, gossany gneiss w/ trace gn	<5		63.9		98		1417		378		14	15	2	1.10	292
100.3	8692	South Silver	R	G		RC	Fest gneiss w/ qz br	6		3.3		26		405		205		7	7	2	0.42	50
101.1	8815	Camp 6 Area	R	S		OC	Fest gneiss w/ 1/4" po band	10		0.7		186		21		95		22	27	15	2.19	<5
101.2	8816	Camp 6 Area	R	RC		OC	Gneiss w/ gn, sl	13		58.0		1591		1324		9.50	*	5	16	69	1.70	18
101.2	8817	Camp 6 Area	R	S		OC	Gneiss w/ gn, sl	8		7.3		1976		41		4.00	*	4	26	110	0.26	6
102.1	641	Lake Cirque	R	C	3.7	TP	Calc sil rx w/ py, po, sl, gn, & cp	34		6.7		2477		40		16936		2	4	21	0.73	<5
102.2	648	Lake Cirque	R	C	0.6	OC	Sil lens of gneiss w/ py & unidentified sul	<5		3.9		192		2985		2208		2	7	9	3.28	228
102.3	608	Lake Cique, E Zone	R	G	0.7	FL	Green pyroxene w/ sl, gn, & po	128		2.4		754		53		7.60	*	3	6	22	0.70	5
102.4	610	Lake Cique, E Zone	R	Rep	0.2	OC	Sheared gneiss w/ sl & gn	10		6.8		1119		272		13.90	*	3	14	84	1.09	9
102.4	611	Lake Cique, E Zone	R	C	2	OC	Green pyroxene w/ msv sl & gn	83		41.8		1430		1.62	*	10.30	*	5	10	46	2.14	348
102.5	609	Lake Cique, E Zone	R	S	0.6	OC	Green pyroxene w/ sl, gn, & po	16		31.5		110		4.16	*	4.10	*	7	17	24	2.21	8
102.6	8863	Lake Cique	R	SC	5@.5	OC	Fest ryholite w/ sulf	10		33.7		4085		94		975		4	3	4	1.34	27
102.7	634	Lake Cique, E Zone	R	C	2.7	OC	Granulite w py, sl, & gn	23		1.7		383		58		14410		6	17	14	1.63	<5
102.8	8852	Lake Cique, E Zone	R	Rep		OC	Granulite w/ sl, gn, & po	21		8.5		1014		2810		15897		4	12	30	1.35	19
102.9	612	Lake Cique, E Zone	R	C	1.8	OC	Pyroxene w/ sl, gn, & po	56		2.7		1019		148		4.90	*	8	13	18	1.24	12
102.10	8850	Lake Cique, E Zone	R	Rep		OC	Granulite w/ sl, gn, & po	109		1.6		556		348		4.20	*	2	5	13	0.60	47
102.10	8851	Lake Cique, E Zone	R	S		OC	Granulite w/ sl, gn, & po	107		3.2		1533		68		6.30	*	<1	6	28	0.30	6
102.11	635	Lake Cique, E Zone	R	C	5	OC	Msv py, po, sl, gn, & cp	74		2.5		1355		36		5.30	*	4	9	39	1.01	<5
102.12	8862	Lake Cique	R	Rep		OC	Fest ryholite w/ sulf	9		14.0		2610		137		560		4	3	4	1.44	188
102.13	636	Lake Cique, E Zone	R	C	1.8	OC	Calc-silicate w/ py, po, sl	40		2.9		939		32		9.90	*	5	25	35	1.07	<5
102.14	8864	Lake Cirque, W Zone	R	C	3	OC	Rhyolite w/ cp, sl	14		10.6		994		435		3150		5	14	27	4.73	5840
102.15	8865	Lake Cirque, W Zone	R	Rep		OC	Fest gneiss w/ sl	12		70.0		4630		1381		17116		4	6	44	2.57	>10000
102.16	8866	Lake Cirque, W Zone	R	SC	3@.25	OC	Fest gneiss w/ sl	<5		63.0		1829		7393		17895		5	3	7	3.36	1456
102.17	639	Lake Cirque, S Zone	R	G	0.4	OC	Sil green gneiss w/ sl, py, po, cp	8		8.1		1250		124		5.50	*	3	15	42	0.91	<5
102.17	640	Lake Cirque, S Zone	R	Rep	1	RC	Green sil rocks w/ py, sl	26		6.1		750		191		12.80	*	<1	7	76	0.50	<5
102.17	642	Lake Cirque, S Zone	R	SC	7@.25	OC	Sheared, fest gneiss w/ py, po, sl	8		1.2		129		57		11377		4	13	18	3.16	<5
102.17	643	Lake Cirque, S Zone	R	C	2	OC	Sil blocky gneiss w/ py, po, sl, gn	8		9.3		1554		59		3.60	*	3	14	34	2.32	27
102.18	637	Lake Cirque, S Zone	R	G	0.5	RC	Green pyroxene w/ msv sl, py, po	39		35.9		3729		370		10.40	*	4	9	133	0.70	14
102.19	638	Lake Cirque, S Zone	R	G	0.3	OC	Fest gneiss w/ py, po, sl	9		12.7		2518		31		15351		3	13	22	3.36	<5
102.20	8867	Lake Cirque, S Zone	R	C	2	OC	Gneiss w/ sulf	78		1497.5		177		9.22	*	1050		2	2	7	2.42	113
102.21	644	Lake Cirque, USGS Zone	R	C	3.3	OC	Fest gneiss/granulite w/ sparse sl	31		13.6		300		546		14024		3	2	8	1.14	<5
102.21	645	Lake Cirque, USGS Zone	R	C	2.7	OC	Fest gneiss/granulite w/ py, sl	9		130.0		1057		1.06	*	2.80	*	4	4	14	0.60	<5
102.21	646	Lake Cirque, USGS Zone	R	C	5	OC	Fest gneiss/granulite w/ sparse sl, py	14		1.0		119		43		1521		13	7	8	4.60	<5
102.22	647	Lake Cirque, USGS Zone	R	C	1.7	OC	Fest gneiss granulite w/ sparse sl	60		3.4		128		187		3680		11	5	9	6.01	12
102.23	8869	Lake Cirque, USGS Zone	R	C	5	OC	Gneiss w/ sl	22		3.8		143		160		3636		13	6	5	3.06	401
102.24	9737	Lake Cirque, USGS Zone	R	CC	0.8	OC	Fest sil calc band w/ py, sl, gn	181		57.9		186		1.71	*	3315		3	20	12	2.14	4769
102.25	995	Lake Cirque, USGS Zone	R	CC	0.3	OC	Fest argillite w/ cp, sl	27		95.8		3027		186		3936		8	16	22	3.09	<5
102.26	8870	Lake Cirque, USGS Zone	R	C	2	OC	Gneiss w/ py	73		10.0		85		837		328		4	9	2	0.70	279

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
99.8	9592	Copper Zone	926	*	22	0.07	1.9	119	1.57	3	<0.01	0.40	6	0.10	257	0.01	5	<5	<5	78	*	3	<10	<0.01	3	8	*		
99.8	9593	Copper Zone	<10	*	15	2.35	84.2	140	5.29	6	0.016	0.32	5	0.93	1998	0.03	4	<5	<5	61	*	15	<10	0.01	47	<4	*		
99.8	9594	Copper Zone	<10	*	45	0.35	66.6	158	14.44	3	0.014	0.14	8	1.07	380	<0.01	1	<5	6	49	*	4	<10	<0.01	57	<4	*		
99.8	9595	Copper Zone	277	*	14	0.42	7.8	287	4.70	4	<0.01	0.17	10	0.37	751	<0.01	5	<5	6	57	*	5	<10	0.02	72	12	*		
99.8	9596	Copper Zone	164	*	713	3.66	29.1	19	24.52	4	0.038	1.15	2	0.91	557	0.17	13	<5	9	240	*	28	<10	0.04	85	<4	*		
99.9	130	Copper Zone	129	*	177	0.78	44.4	169	9.88	4	0.018	0.30	4	0.69	2743	0.02	7	<5	6	520	*	27	<10	0.01	93	<4	*		
99.9	131	Copper Zone	188	*	529	0.21	63.4	90	17.45	<2	0.023	0.31	2	0.09	299	<0.01	20	<5	<5	321	*	12	<10	<0.01	<1	<4	*		
99.9	132	Copper Zone	246	*	86	0.01	348.6	121	3.19	<2	0.021	0.39	1	0.09	193	<0.01	5	<5	<5	249	*	<1	17	<0.01	2	<4	*		
99.9	133	Copper Zone	202	*	534	0.68	120.3	31	21.95	12	0.049	0.47	2	1.29	6367	<0.01	5	<5	7	1728	*	40	<10	<0.01	87	<4	*		
100.1	428	South Silver	229	*	<5	0.12	0.2	143	2.19	6	<0.01	0.25	4	0.23	235	<0.01	7	<5	<5	<4	*	2	<10	<0.01	63	<4	*		
100.2	8690	South Silver	<20	*	<5	0.80	<0.2	247	0.87	4	<0.01	0.25	2	0.06	119	0.01	<1	<5	<5	1089		7	<10	<0.01	25	<20			
100.3	8691	South Silver	418	*	<5	0.08	1.4	245	4.09	3	<0.01	0.25	6	0.43	1572	<0.01	<1	<5	<5	80	*	4	<10	<0.01	54	<4	*		
100.3	8692	South Silver	194	*	<5	0.01	1.0	214	1.45	3	<0.01	0.11	2	0.13	518	<0.01	<1	<5	<5	11	*	<1	<10	<0.01	21	<4	*		
101.1	8815	Camp 6 Area	325	*	<5	0.55	0.3	128	5.74	3	0.016	0.13	3	1.17	487	0.11	11	<5	8	5	*	50	<10	0.12	150	<4	*		
101.2	8816	Camp 6 Area	61	*	33	0.77	561.0	45	>10	<2	0.077	0.11	2	1.25	786	0.06	2	<5	<5	36	*	27	29	0.08	62	<4	*		
101.2	8817	Camp 6 Area	<10	*	<5	0.05	195.7	8	>10	<2	0.037	<0.01	<1	0.11	158	<0.01	<1	<5	<5	34	*	<1	21	<0.01	26	<4	*		
102.1	641	Lake Cirque	<10	*	20	1.31	97.2	24	6.15	<2	0.012	0.03	2	0.12	4350	<0.01	<1	<5	<5	592	*	27	<10	0.06	15	<4	*		
102.2	648	Lake Cirque	507	*	<5	2.48	12.6	45	4.71	4	<0.01	1.40	7	1.18	659	0.21	4	<5	9	442	*	141	<10	0.08	62	28	*		
102.3	608	Lake Cique, E Zone	<10	*	45	0.86	432.2	35	>10	<2	0.018	0.01	<1	0.23	742	0.01	<1	<5	<5	1097	*	13	16	0.05	11	<4	*		
102.4	610	Lake Cique, E Zone	<10	*	<5	0.68	874.5	18	>10	<2	0.052	0.08	2	0.72	2050	0.03	<1	<5	<5	161	*	6	16	0.04	25	<4	*		
102.4	611	Lake Cique, E Zone	<10	*	74	3.16	544.3	30	8.43	<2	0.033	0.34	4	0.89	1967	0.02	1	<5	<5	280	*	35	<10	0.07	32	<4	*		
102.5	609	Lake Cique, E Zone	<10	*	34	2.06	242.0	82	5.97	3	0.018	0.17	4	0.86	1676	<0.01	4	<5	<5	191	*	30	<10	0.08	69	<4	*		
102.6	8863	Lake Cique	248	*	<5	0.50	9.2	105	1.98	6	<0.01	0.85	9	0.03	148	0.02	2	<5	<5	1032	*	7	<10	<0.01	2	12	*		
102.7	634	Lake Cique, E Zone	13	*	25	1.85	79.1	48	6.62	<2	<0.01	0.04	3	0.43	1067	0.01	3	<5	<5	1112	*	37	<10	0.16	47	<4	*		
102.8	8852	Lake Cique, E Zone	32	*	17	1.28	81.1	52	>10	<2	<0.01	0.12	3	0.58	989	0.02	<1	<5	<5	1149	*	21	<10	0.07	27	<4	*		
102.9	612	Lake Cique, E Zone	<10	*	60	1.08	282.6	45	>10	<2	0.011	0.05	2	0.32	736	0.02	2	<5	<5	1413	*	20	13	0.10	45	<4	*		
102.10	8850	Lake Cique, E Zone	<10	*	20	0.95	237.0	49	9.50	<2	<0.01	0.02	2	0.10	959	<0.01	<1	<5	<5	451	*	19	14	0.05	13	<4	*		
102.10	8851	Lake Cique, E Zone	<10	*	68	0.47	321.6	22	>10	<2	<0.01	0.01	<1	0.08	730	<0.01	<1	<5	<5	419	*	7	17	0.02	10	<4	*		
102.11	635	Lake Cique, E Zone	<10	*	35	0.99	280.0	29	>10	<2	0.015	0.03	1	0.40	792	0.02	<1	<5	<5	868	*	17	<10	0.07	26	<4	*		
102.12	8862	Lake Cique	257	*	<5	0.75	4.8	91	2.42	8	<0.01	0.91	9	0.03	147	0.02	2	<5	<5	458	*	7	<10	<0.01	2	13	*		
102.13	636	Lake Cique, E Zone	52	*	49	0.75	488.0	44	>10	<2	0.026	0.05	2	0.45	792	0.02	2	<5	<5	628	*	11	20	0.06	48	<4	*		
102.14	8864	Lake Cirque, W Zone	383	*	15	4.87	34.2	47	9.07	8	0.017	1.60	4	1.02	1014	0.15	2	6	11	590	*	59	<10	0.02	62	16	*		
102.15	8865	Lake Cirque, W Zone	279	*	12	1.63	186.8	77	8.72	3	0.022	0.87	1	0.75	1113	0.06	<1	36	9	4013	*	15	<10	<0.01	51	<4	*		
102.16	8866	Lake Cirque, W Zone	214	*	23	6.14	65.7	68	6.10	19	0.026	1.58	3	0.28	321	0.06	<1	11	10	5199	*	148	<10	<0.01	38	<4	*		
102.17	639	Lake Cirque, S Zone	<10	*	<5	2.41	309.7	29	5.98	<2	0.024	0.05	2	0.39	2576	<0.01	2	<5	<5	1243	*	31	15	0.06	32	<4	*		
102.17	640	Lake Cirque, S Zone	<10	*	6	0.74	710.0	26	7.66	<2	0.047	0.02	1	0.18	1464	<0.01	<1	<5	<5	407	*	10	15	0.03	8	<4	*		
102.17	642	Lake Cirque, S Zone	413	*	<5	4.97	53.7	40	8.48	2	<0.01	0.39	11	1.80	4156	0.05	4	<5	7	570	*	104	<10	0.12	79	<4	*		
102.17	643	Lake Cirque, S Zone	41	*	<5	6.73	173.4	33	>10	3	0.022	0.20	6	1.26	6278	0.08	2	<5	5	556	*	68	<10	0.10	42	<4	*		
102.18	637	Lake Cirque, S Zone	<10	*	19	0.04	444.6	53	>10	<2	0.043	<0.01	2	0.29	1034	<0.01	<1	6	<5	146	*	<1	20	<0.01	17	<4	*		
102.19	638	Lake Cirque, S Zone	<10	*	<5	0.31	88.1	46	>10	7	0.016	0.05	2	2.70	2969	<0.01	<1	<5	<5	1777	*	5	11	0.03	40	<4	*		
102.20	8867	Lake Cirque, S Zone	1078	*	<5	0.41	11.5	51	7.79	2	0.038	0.30	<1	0.91	1809	0.06	7	469	7	171	*	14	<10	0.17	122	<4	*		
102.21	644	Lake Cirque, USGS Zone	<10	*	83	4.29	64.4	17	9.80	<2	0.013	0.07	3	0.34	4581	0.05	<1	<5	<5	1173	*	24	<10	0.05	16	<4	*		
102.21	645	Lake Cirque, USGS Zone	<10	*	243	1.06	148.2	13	7.92	<2	0.013	0.02	2	0.15	2187	<0.01	<1	<5	<5	757	*	19	16	0.04	10	<4	*		
102.21	646	Lake Cirque, USGS Zone	139	*	<5	0.90	13.8	48	>10	5	<0.01	1.77	7	0.93	1394	0.01	23	<5	8	2301	*	22	<10	0.18	307	16	*		
102.22	647	Lake Cirque, USGS Zone	183	*	28	2.61	25.1	13	>10	11	0.018	0.38	10	0.80	3523	0.01	2	<5	6	3323	*	15	<10	0.03	60	108	*		
102.23	8869	Lake Cirque, USGS Zone	200	*	7	0.86	24.4	105	7.70	9	0.013	0.63	7	0.52	1494	0.01	<1	<5	<5	1647	*	6	<10	<0.01	19	15	*		
102.24	9737	Lake Cirque, USGS Zone	272	*	<5	0.85	40.3	38	>10	<2	0.066	1.07	3	0.25	388	0.01	<1	21	<5	1092	*	11	<10	<0.01	26	59	*		
102.25	995	Lake Cirque, USGS Zone	123	*	21	2.37	17.0	17	>10	5	0.032	0.61	7	1.25	3706	0.04	2	<5	<5	1090	*	42	<10	0.15	52	161	*		
102.26	8870	Lake Cirque, USGS Zone	157	*	<5	0.11	2.4	256	6.08	4	0.015	0.21	3	0.27	209	<0.01	<1	8	<5	216	*	10	<10	<0.01	25	<4	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
103.1	8821	North Marsha Peak	R	Rep		OC	Rhyolite	<5		0.7		14		101		138		2	4	<1	0.73	<5
103.2	8820	North Marsha Peak	R	SC	5@.5	OC	Gneiss w/ sl	25		2.7		106		1715		2267		7	10	7	4.56	101
103.3	8818	North Marsha Peak	R	SC	5@.5	OC	Gneiss w/ gn, sl	<5		2.5		74		2132		2696		5	6	18	4.15	<5
103.3	8819	North Marsha Peak	R	SC	5@.5	OC	Gneiss w/ sl	<5		5.0		109		3366		3531		6	6	9	5.15	<5
103.4	579	North Marsha Peak	R	C	3.2	TP	Qz sc w/ seams of sl, gn	9		72.0		384		4.95	*	9089		3	6	3	0.91	328
103.4	580	North Marsha Peak	R	C	0.4	TP	Gn	50		829.3		613		48.58	*	2.20	*	<1	28	31	0.16	361
103.4	581	North Marsha Peak	R	C	0.4	OC	Gn ~80%	34		873.4		191		54.10	*	4.30	*	4	8	16	0.21	6266
103.4	8824	North Marsha Peak	R	S		OC	Gn vn	78		1772.6		394		80.12	*	8321		<1	1	5	0.05	1908
103.4	8825	North Marsha Peak	R	C	4	OC	Rhyolite w/ gn, sl	10		15.2		197		7846		558		2	10	2	0.96	2168
103.4	8826	North Marsha Peak	R	C	4	OC	Rhyolite w/ sl, gn	<5		56.0		2454		3305		18.74	*	7	42	43	2.57	12
103.5	576	North Marsha Peak	R	C	0.5	OC	Sil gneiss w/ sl, gn	8		30.1		704		3.47	*	2.30	*	4	2	4	0.18	<5
103.5	577	North Marsha Peak	R	C	0.4	OC	Gn band in gossan	44		938.9		649		62.87	*	12192		<1	1	2	0.19	714
103.5	578	North Marsha Peak	R	S	0.3	OC	Msv sl & pyroxenite	14		76.0		1284		4138		11.40	*	7	17	31	3.31	13
103.6	8698	North Marsha Peak	R	S		OC	Vuggy fracture zone in gneiss	5661		9.6		47		250		92		5	3	<1	0.45	26
103.7	2642	North Marsha Peak	R	Rep	0.4	TP	Sulf along shear	15		8.80	*	1.73	*	600		14.50	*	10	2	59	2.78	34
103.7	8697	North Marsha Peak	R	C	2.4	TP	Qz & sulf at fractured rhyolite-gneiss contact	18		53.9		3899		1084		1.33	*	27	6	5	0.85	33
103.8	440	North Marsha Peak	R	C	0.4	OC	Fest, sil br w/ po, trace sl	<5		3.6		69		1144		2933		7	19	20	4.48	27
103.9	2643	North Marsha Peak	R	Rep	0.5	OC	Vuggy, fest, sil band in sc & gneiss	<5		12.0		275		870		540		6	4	1	0.96	92
104.1	8704	East Marsha Peak	R	C	0.5	OC	Lens of dissem sl in fractured sil gneiss	<5		9.5		410		279		10.65	*	103	13	78	1.51	16
104.2	446	East Marsha Peak	R	S	0.4	TP	Qz-sulf bands w/ po, sl, gn, cp	35		51.6		3523		309		10.39	*	79	11	37	0.65	156
104.2	447	East Marsha Peak	R	S	0.2	TP	Gray sulf w/ py	27		139.3		7169		306		14.20	*	15	11	60	0.38	77
104.2	449	East Marsha Peak	R	C	3	TP	Sil, fest, hbl-rich rock w/ blebs of cp, sl, gn	<5		27.4		1590		324		2.18	*	27	20	10	2.29	11
104.2	450	East Marsha Peak	R	C	6	TP	Sil, fest, sheared gneiss w/ po, sl, gn, cp	18		11.1		831		119		2.40	*	5	26	18	2.52	77
104.2	8703	East Marsha Peak	R	Rep	1.5	OC	Fest, sil, alt gneiss w/ py, cp	9		33.7		3834		139		2.79	*	4	28	38	1.07	20
104.3	448	East Marsha Peak	R	C	2	TP	Msv sl & gn in gneiss	36		49.6		785		3.47	*	16.14	*	2	19	31	2.07	20
104.4	8699	East Marsha Peak	R	SC	10@.5	TP	Gneiss w/ dissem & stringers of py, po, gn, sl, cp	6		25.1		405		2.04	*	1.67	*	3	21	16	2.15	18
104.4	8700	East Marsha Peak	R	SC	10@.5	TP	Fest, sil gneiss w/ gn, py, po, sl, cp	<5		8.5		370		2186		1.15	*	3	29	15	2.71	7
104.4	8701	East Marsha Peak	R	SC	10@.5	TP	Fest, sil gneiss w/ gn, py, po, sl, cp	6		20.1		196		7849		1.27	*	2	29	10	1.55	28
104.4	8702	East Marsha Peak	R	SC	10@.5	TP	Fest, sil gneiss w/ gn, py, po, sl, cp	<5		11.8		613		1351		2.56	*	10	21	24	2.56	20
104.4	8705	East Marsha Peak	R	SC	10@.5	TP	Qz br vn w/ fluorite, py, sl, gn, cp in gneiss	19		38.2		2543		3792		9833		48	8	9	1.66	82
104.4	8706	East Marsha Peak	R	SC	11@.5	TP	Qz br vn w/ py, gn, sl in fractured gneiss	369		32.0		1653		6326		1.52	*	39	5	14	1.21	1489
104.4	8707	East Marsha Peak	R	C	2.1	TP	Qz-filled fracture w/ sl stringers in gneiss	<5		19.4		817		492		1.41	*	288	14	14	2.33	12
104.5	441	East Marsha Peak	R	SC	7@.125	TP	Fest, shear zone w/ po, sl, gn	<5		13.9		858		1.25	*	1.93	*	5	22	17	2.25	21
104.5	442	East Marsha Peak	R	SC	4.7@.125	TP	Sil zone w/ sparse sulf	<5		3.0		92		530		2443		6	7	1	0.58	19
104.5	443	East Marsha Peak	R	SC	7.7@.125	TP	Fest shear zone w/ po, sl, gn	<5		11.3		846		1.06	*	1.49	*	8	22	12	2.26	33
104.5	444	East Marsha Peak	R	C	6.5	TP	Sheared, fest gneiss w/ po, sl, gn	6		7.9		749		1520		1.22	*	4	14	14	2.68	31
104.5	445	East Marsha Peak	R	C	2.2	OC	Qz-sulf band w/ sl, gn, cp	19		35.3		2300		3921		27.14	*	8	4	102	0.88	58
104.5	451	East Marsha Peak	R	C	3.5	TP	Fest, sil gneiss w/ po, sl, gn	<5		78.7		7260		2.42	*	9.38	*	27	15	59	2.60	41
104.5	452	East Marsha Peak	R	C	7	OC	Vuggy, fest qz vn w/ sulf	272		13.7		353		490		1.45	*	30	9	12	1.42	679
104.5	453	East Marsha Peak	R	SC	5@.125	RC	Vuggy, fest qz vn w/ po, sl, gn	139		14.3		145		556		3750		27	13	5	1.94	597
104.6	135	East Marsha Peak	R	G	0.3	OC	Vuggy, fest qz vn w/ sl	17		12.9		655		932		936		12	8	3	0.96	38
104.7	134	East Marsha Peak	R	S	0.3	OC	Irregular vuggy qz vn w/ sl, gn	7		6.8		518		3980		7157		6	13	10	2.07	22
104.8	9597	East Marsha Peak	R	S		OC	Gneiss w/ mo	<5		1.2		89		15		72		17	13	2	0.74	13
105.1	632	Nelson Glacier	R	Rep	2	OC	Fest sil gneiss w/ dissem po	<5		0.3		76		13		140		6	28	21	2.27	9
105.1	633	Nelson Glacier	R	C	0.4	OC	Fest sil gneiss at shear w/ py, trace sl, gn	500		4.1		45		93		186		4	45	16	2.65	468
105.2	620	Nelson Glacier	R	G	0.4	OC	Fest gneiss w/ dissem py, po	<5		0.4		43		158		575		9	32	11	1.87	<5
105.2	8859	Nelson Glacier	R	Rep		OC	Gneiss w/ gray sulf	23		10.1		90		92		251		6	17	16	1.38	2151
105.3	619	Nelson Glacier	R	C	0.1	OC	Sil shear w/ gn, sl, py	10		69.0		416		6.04	*	2.50	*	8	7	30	1.07	69
105.4	614	Nelson Glacier	R	G	0.1	OC	Qz w/ sl, py, gn	16		46.3		430		4513		2.40	*	8	21	16	1.23	299

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
103.1	8821	North Marsha Peak	40	*	<5	0.46	0.9	147	0.73	6	<0.01	0.45	7	0.02	80	0.14	20	<5	<5	52	*	6	<10	<0.01	2	19	*		
103.2	8820	North Marsha Peak	236	*	<5	2.15	11.3	106	9.70	7	0.011	0.69	3	1.25	4142	0.01	5	<5	9	501	*	36	<10	<0.01	91	24	*		
103.3	8818	North Marsha Peak	410	*	<5	3.37	11.6	46	8.31	7	<0.01	0.56	8	1.69	3552	0.17	17	<5	21	263	*	38	<10	0.17	234	<4	*		
103.3	8819	North Marsha Peak	194	*	<5	0.37	23.1	46	>10	9	0.013	0.42	3	1.53	4672	<0.01	7	<5	9	603	*	19	<10	<0.01	132	17	*		
103.4	579	North Marsha Peak	610	*	29	0.38	78.0	159	2.89	<2	0.012	0.31	1	0.18	543	0.02	<1	45	<5	119	*	10	<10	<0.01	4	<4	*		
103.4	580	North Marsha Peak	<10	*	<5	<0.01	137.1	12	>10	<2	0.019	0.04	<1	0.01	93	<0.01	<1	617	<5	301	*	<1	<10	<0.01	7	<4	*		
103.4	581	North Marsha Peak	<10	*	8	0.03	383.6	51	2.24	<2	0.036	0.10	1	0.02	254	<0.01	<1	770	<5	411	*	<1	<10	<0.01	5	<4	*		
103.4	8824	North Marsha Peak	<10	*	<5	<0.01	107.0	3	1.73	<2	0.046	0.02	<1	<0.01	61	<0.01	<1	1520	<5	396	*	<1	<10	<0.01	1	<4	*		
103.4	8825	North Marsha Peak	624	*	<5	0.05	10.1	223	4.67	<2	0.018	0.29	2	0.30	291	<0.01	<1	19	<5	144	*	2	<10	<0.01	20	<4	*		
103.4	8826	North Marsha Peak	143	*	33	0.49	1221.1	60	>10	4	0.095	0.17	10	1.11	3275	0.02	4	<5	<5	729	*	12	19	0.06	85	<4	*		
103.5	576	North Marsha Peak	<10	*	<5	6.68	131.0	31	8.11	<2	0.011	0.04	<1	1.51	10838	0.03	<1	8	<5	120	*	25	<10	<0.01	7	<4	*		
103.5	577	North Marsha Peak	<10	*	8	0.01	124.2	30	9.50	<2	0.059	0.01	1	0.03	170	<0.01	<1	939	<5	428	*	<1	<10	<0.01	20	<4	*		
103.5	578	North Marsha Peak	142	*	95	0.46	834.6	61	>10	4	0.036	0.57	5	1.53	2202	0.07	5	<5	9	1032	*	20	15	0.14	94	<4	*		
103.6	8698	North Marsha Peak	<10	*	<5	>10	0.5	66	0.57	<2	<0.01	0.23	3	0.03	142	0.40	<1	<5	<5	10	*	37	<10	<0.01	6	9	*		
103.7	2642	North Marsha Peak	30		410	0.51	>100.0	32	4.96	10	0.080	1.19	<10	0.32	990	<.01		2	2			18		<.01	43	<10			
103.7	8697	North Marsha Peak	150	*	58	0.21	104.2	182	2.73	2	<0.01	0.38	4	0.15	286	<0.01	<1	<5	<5	433	*	20	15	<0.01	24	<4	*		
103.8	440	North Marsha Peak	141	*	<5	0.58	20.6	93	>10	11	0.010	0.19	6	1.38	5922	<0.01	<1	<5	5	529	*	6	15	<0.01	96	9	*		
103.9	2643	North Marsha Peak	30		8	<.01	3.0	372	3.73	<10	0.010	0.19	<10	0.15	300	<.01		<2	1			1		<.01	23	<10			
104.1	8704	East Marsha Peak	<10	*	<5	0.14	966.4	101	7.33	7	0.085	0.04	2	0.81	2826	<0.01	<1	29	<5	55	*	4	43	<0.01	57	<4	*		
104.2	446	East Marsha Peak	<10	*	35	1.51	861.8	127	>10	3	0.106	0.11	1	0.24	1228	<0.01	<1	28	<5	829	*	30	45	<0.01	29	<4	*		
104.2	447	East Marsha Peak	<10	*	59	0.93	1067.2	70	>10	3	0.172	0.19	1	0.07	785	<0.01	<1	32	<5	2483	*	4	45	<0.01	12	<4	*		
104.2	449	East Marsha Peak	86	*	24	3.47	191.8	133	9.16	8	0.014	0.39	6	0.75	1715	0.02	<1	<5	<5	166	*	133	22	<0.01	99	<4	*		
104.2	450	East Marsha Peak	1158	*	<5	0.43	225.0	141	7.62	9	0.013	0.27	12	1.28	2125	<0.01	<1	5	5	113	*	6	23	<0.01	104	<4	*		
104.2	8703	East Marsha Peak	57	*	5	0.21	268.8	227	8.00	2	0.041	0.10	5	0.32	1043	<0.01	<1	11	<5	119	*	8	24	<0.01	43	<4	*		
104.3	448	East Marsha Peak	99	*	<5	0.25	1273.2	61	>10	3	0.113	0.20	5	0.91	3763	<0.01	<1	57	<5	80	*	5	31	<0.01	47	<4	*		
104.4	8699	East Marsha Peak	420	*	<5	1.57	124.0	137	9.90	4	0.018	0.41	8	0.81	2529	<0.01	<1	15	<5	83	*	29	19	<0.01	66	<4	*		
104.4	8700	East Marsha Peak	672	*	<5	2.45	88.1	77	8.79	6	<0.01	0.26	9	1.37	3370	0.01	<1	<5	6	159	*	62	15	0.01	99	<4	*		
104.4	8701	East Marsha Peak	412	*	8	2.11	103.3	66	6.15	2	<0.01	0.26	3	0.86	2291	0.01	<1	7	<5	43	*	44	14	<0.01	45	<4	*		
104.4	8702	East Marsha Peak	738	*	8	1.03	226.5	69	7.30	7	0.016	0.37	11	0.99	2222	<0.01	<1	<5	5	113	*	24	16	<0.01	82	<4	*		
104.4	8705	East Marsha Peak	139	*	9	3.26	91.9	210	4.17	8	0.024	0.52	2	0.63	1374	0.02	<1	<5	<5	152	*	36	21	<0.01	60	<4	*		
104.4	8706	East Marsha Peak	29	*	18	6.45	86.3	106	3.02	11	<0.01	0.14	<1	1.27	3882	0.04	<1	44	<5	155	*	50	17	<0.01	22	<4	*		
104.4	8707	East Marsha Peak	609	*	19	2.36	107.7	190	3.85	6	0.018	1.01	5	0.62	1959	0.02	<1	<5	<5	72	*	45	14	<0.01	74	<4	*		
104.5	441	East Marsha Peak	459	*	<5	0.45	159.4	114	9.42	7	0.030	0.29	6	0.87	2064	<0.01	<1	<5	<5	127	*	4	22	<0.01	57	<4	*		
104.5	442	East Marsha Peak	49	*	<5	0.16	22.0	236	2.36	3	<0.01	0.14	2	0.16	436	<0.01	<1	<5	<5	11	*	2	<10	<0.01	8	<4	*		
104.5	443	East Marsha Peak	693	*	<5	0.30	126.7	137	8.01	5	<0.01	0.37	7	0.81	1838	<0.01	<1	<5	<5	112	*	6	16	<0.01	59	<4	*		
104.5	444	East Marsha Peak	1180	*	<5	1.00	102.9	89	6.35	8	<0.01	0.55	10	0.83	1726	0.02	<1	<5	5	121	*	20	19	<0.01	78	<4	*		
104.5	445	East Marsha Peak	<10	*	<5	2.44	>2000	82	>10	8	0.145	0.27	<1	0.25	2666	<0.01	<1	47	<5	168	*	12	73	<0.01	20	<4	*		
104.5	451	East Marsha Peak	580	*	76	0.80	776.2	61	>10	9	0.067	0.30	13	0.86	2323	0.01	<1	18	6	368	*	21	43	0.01	122	<4	*		
104.5	452	East Marsha Peak	62	*	7	6.03	63.8	152	3.26	18	<0.01	0.23	2	1.61	3656	0.05	<1	9	<5	35	*	35	17	0.02	30	<4	*		
104.5	453	East Marsha Peak	74	*	6	2.87	36.2	248	3.88	17	0.012	0.57	2	1.18	1541	<0.01	<1	11	<5	26	*	25	11	<0.01	54	10	*		
104.6	135	East Marsha Peak	32	*	<5	0.10	5.2	250	2.82	2	0.024	0.13	4	0.21	586	<0.01	2	<5	<5	47	*	1	<10	<0.01	30	12	*		
104.7	134	East Marsha Peak	147	*	<5	1.83	54.5	270	4.07	3	<0.01	0.62	2	0.71	1649	0.01	6	<5	6	14	*	18	<10	0.01	79	<4	*		
104.8	9597	East Marsha Peak	1283	*	6	0.05	<0.2	236	2.10	<2	<0.01	0.27	6	0.26	125	0.02	4	<5	<5	<4	*	2	<10	<0.01	83	<4	*		
105.1	632	Nelson Glacier	1535	*	<5	1.15	0.8	86	4.96	3	<0.01	0.66	3	1.23	542	0.20	8	<5	7	<4	*	36	<10	0.22	108	7	*		
105.1	633	Nelson Glacier	1778	*	<5	0.76	2.5	199	4.86	4	0.010	0.19	13	2.19	937	<0.01	4	7	5	<4	*	24	<10	<0.01	68	14	*		
105.2	620	Nelson Glacier	3814	*	<5	0.33	3.1	91	3.81	3	<0.01	0.64	10	1.31	498	0.08	7	<5	8	<4	*	15	<10	0.13	91	<4	*		
105.2	8859	Nelson Glacier	1189	*	<5	2.90	7.7	76	5.19	<2	0.011	0.31	16	0.85	1129	<0.01	4	11	15	12	*	99	<10	<0.01	68	16	*		
105.3	619	Nelson Glacier	311	*	<5	3.91	144.5	70	>10	3	0.042	0.21	9	0.49	2919	0.02	2	26	<5	48	*	86	<10	<0.01	34	<4	*		
105.4	614	Nelson Glacier	481	*	<5	0.24	211.9	125	5.57	<2	0.031	0.25	<1	0.48	1460	<0.01	2	7	6	36	*	3	12	0.04	40	<4	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
105.4	8849	Nelson Glacier	R	S		OC	Gneiss w/ gn, sl	31		526.1		1712		39.90	*	4.10	*	22	15	39	0.40	7
105.5	656	Nelson Glacier	R	G	0.05	FL	Tonalite w/ qz band w/ py & sparse cp	8		0.3		49		16		274		9	16	10	1.19	<5
105.5	8873	Nelson Glacier	R	S		FL	Tonalite	<5		0.5		214		14		38		7	78	33	1.26	<5
105.6	118	Nelson Glacier	R	Rep	1	FL	Sil sulf zone w/ sl, cp, gn, po & qz bands	106		2.64	*	8394		4692		15.46	*	14	13	82	0.65	647
105.6	606	Nelson Galcier	R	C	1.5	FL	Msv sl w/ gn, cp	353		41.9		2676		6485		20.55	*	37	6	72	0.93	2481
105.7	605	Nelson Glacier	R	C	0.1	OC	Sheared gneiss w/ po, sl, gn	<5		17.9		688		7778		5859		24	7	8	0.67	<5
105.8	117	Nelson Glacier	R	Rep	0.4	FL	Msv sulf boulder w/ sl, gn, cp, po	29		36.8		2358		8.21	*	5.88	*	3	7	49	0.43	79
105.9	119	Nelson Glacier	R	Rep	0.5	FL	Msv cg sl w/ cp, po	24		8.43	*	1.51	*	6202		25.95	*	3	4	138	0.66	19
105.10	116	Nelson Glacier	R	Rep	0.07	OC	Qz-sulf vn w/ sl, gn, cp, py	15		42.0		624		3.73	*	3.56	*	10	22	44	1.23	10
105.10	8846	Nelson Glacier	R	S		OC	Gneiss w/ gn, sl	<5		10.6		489		5964		7201		28	6	8	0.64	<5
105.11	9580	Nelson Glacier	R	Rep	0.8	FL	Sil gneissic metaseds w/ py stringers	902		3.4		24		155		473		4	15	8	1.83	1470
105.11	9581	Nelson Glacier	R	Rep	0.5	FL	Sil gneissic metaseds w/ sl, cp, gn	93		44.9		3451		2245		12.03	*	49	9	62	0.90	173
105.12	8847	Nelson Glacier	R	S		OC	Gneiss w/ gn, sl	7		13.9		1417		1282		3995		5	7	17	1.13	23
105.13	9582	Nelson Glacier	R	Rep	0.2	FL	Msv sl w/ minor cp	17		2.87	*	1.42	*	273		13.83	*	14	36	87	3.41	14
105.13	9583	Nelson Glacier	R	Rep	0.4	FL	Sil gneissic metaseds w/ blebs of sl, gn, cp	<5		45.4		1393		6.06	*	19.94	*	3	23	41	1.68	13
105.14	129	Nelson Glacier	R	Rep	0.65	FL	Msv gn, sl, py, po w/ qz & calc	71		5.69	*	4700		7.80	*	10.39	*	43	10	13	0.26	2837
105.15	613	Nelson Glacier	R	G	0.7	RC	Qz br zone w/ py matrix	185		13.5		285		120		5000		4	24	39	0.13	302
105.15	8853	Nelson Glacier	R	Rep		OC	Qz vn	212		7.5		60		65		3048		2	19	22	0.16	403
105.16	8854	Nelson Glacier	R	Rep		OC	Fault gouge in gneiss	6		2.5		33		31		257		2	50	8	1.59	22
105.17	9590	Nelson Glacier	R	Rep	0.5	FL	Qz br w/ gn, py, sl	35		7.09	*	1273		1.63	*	1.87	*	17	18	14	0.62	70
105.18	9589	Nelson Glacier	R	Rep	0.5	OC	Msv py & gray sulf in qz br	359		12.0		325		624		2491		<1	28	54	0.13	702
106.1	143	West Nelson Glacier	R	C	0.4	OC	Qz br zone w/ gneiss, sulf	<5		1.0		38		236		621		10	25	5	0.89	11
106.2	9602	West Nelson Glacier	R	C	0.5	OC	Vuggy qz vn w/ py, gn, cp, sl	9		11.8		442		2075		2057		12	11	3	0.49	217
106.2	9603	West Nelson Glacier	R	C	0.2	OC	Msv sulf in vuggy qz shear zone	94		4.39	*	526		2.70	*	9577		30	22	23	2.01	8363
107.1	2836	Huff	R	G		FL	Qz vn	28		1.1		17		8		10		4	2	<1	0.49	228
107.1	2837	Huff	R	C	0.7	OC	Qz vn w/ sulf	37		1.2		32		10		51		3	9	6	1.46	108
107.1	2838	Huff	R	S		OC	Msv py	11		2.9		22		29		25		2	8	29	0.85	126
107.2	422	Huff	R	C	3	OC	Sulf in shear zone w/ gossan & qz vns	86		1.8		38		107		136		<1	7	9	1.29	234
107.2	423	Huff	R	C	5	OC	Gossan in shear zone	296		2.2		76		27		194		3	25	18	2.75	554
107.2	424	Huff	R	C	3	OC	Sheared, fest gneiss w/ sulf	137		0.6		26		14		99		2	19	13	2.91	270
107.2	425	Huff	R	C	1.8	OC	Sheared, vuggy qz vns	198		2.1		21		20		51		4	6	3	1.73	584
107.2	426	Huff	R	C	1.8	OC	Shear zone w/ vuggy qz bands & sulf	81		2.1		28		35		87		3	3	2	1.05	156
107.3	96	Huff	R	C	0.4	OC	Fest qz vn w/ gn, po, py	2166		228.40	*	309		6.24	*	595		2	4	<1	0.26	2440
107.3	97	Huff	R	G	0.7	OC	Qz-cc br zone w/ sulf	39		40.1		49		960		945		5	<1	<1	0.17	438
107.3	261	Huff	R	C	5.2	OC	Qz vn	<5		<0.1		3		19		12		<1	3	<1	0.17	<5
107.3	262	Huff	R	Rep	2.5	OC	Qz vn	<5		0.4		7		18		23		<1	4	<1	0.18	29
107.3	420	Huff	R	S	0.3	RC	Vuggy qz-py band w/ sl & gn	157		162.6		475		6528		3.10	*	6	10	16	0.14	**1.77%**
107.4	584	Huff	R	RC	1	OC	Fest cc w/ sl, gn, po	73		241.0		4403		6.60	*	5.40	*	9	8	3	1.12	144
107.5	92	Huff	R	G	0.6	RC	Gneiss w/ po	<5		0.9		88		274		629		9	41	9	1.78	<5
107.6	93	Huff	R	Rep	0.2	OC	Granular py lens in marble & calc-silicates	212		1.3		142		83		84		3	28	22	2.28	53
107.7	454	Huff	R	C	0.3	OC	Fest, sheared ls w/ po, sl, gn	81		251.3		3994		4.87	*	5.12	*	4	14	21	1.78	198
107.7	984	Huff	R	CC	1	OC	Qz sulf vn w/ gn, sl	53		302.0		4365		6.80	*	4.40	*	4	26	25	2.46	282
107.8	254	Huff	R	Rep	2.7	OC	Msv sulf layer in ls & marble	<5		4.60	*	7330		15.71	*	9.10	*	<1	5	<1	0.14	6
107.9	583	Huff	R	C	2.9	OC	Msv sulf of po, sl, gn	33		68.0		3480		3.38	*	22.68	*	<1	3	2	0.36	9
107.10	255	Huff	R	Rep	7	OC	Msv sulf in marble	<5		2.90	*	6212		20.08	*	6.80	*	<1	4	4	0.41	<5
107.11	91	Huff	R	Rep	1.4	OC	Msv band of gn, sl, po in marble	<5		114.9		6412		11.18	*	7.10	*	<1	17	8	0.16	6
107.12	90	Huff	R	G	5	OC	Msv band of gn, sl, po in marble	<5		46.7		2688		3.28	*	7.30	*	2	10	1	0.59	11
107.13	8828	Huff	R	S		OC	Marble	158		2.9		25		1181		219		12	56	10	1.36	289
107.14	8972	Huff	R		.2	OC	Py lens	<5		3.2		256		8		298		26	197	81	4.74	10

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
105.4	8849	Nelson Glacier	<10	*	<5	1.11	321.0	53	>10	<2	0.052	0.01	1	0.15	2694	0.03	2	307	<5	64	*	25	17	<0.01	57	<4	*		
105.5	656	Nelson Glacier	922	*	<5	0.29	1.0	189	3.38	<2	0.011	0.65	2	0.80	366	0.07	6	<5	<5	<4	*	18	<10	0.21	82	<4	*		
105.5	8873	Nelson Glacier	291	*	<5	1.26	0.5	79	4.81	<2	<0.01	0.03	7	0.39	123	0.13	1	<5	<5	<4	*	62	<10	0.12	36	5	*		
105.6	118	Nelson Glacier	<10	*	10	1.59	1269.9	88	6.56	<2	0.806	0.01	<1	0.66	2805	0.01	2	14	<5	667	*	13	26	<0.01	18	<4	*		
105.6	606	Nelson Galcier	<10	*	17	4.19	1442.7	72	9.39	4	0.186	0.10	<1	0.52	2821	0.03	<1	41	<5	532	*	22	23	<0.01	23	<4	*		
105.7	605	Nelson Glacier	168	*	<5	9.73	46.5	108	4.66	<2	0.017	0.03	3	0.35	5220	0.02	4	<5	<5	<4	*	402	<10	<0.01	48	<4	*		
105.8	117	Nelson Glacier	<10	*	<5	0.69	374.4	37	31.90	<2	0.282	0.06	2	0.17	2179	<0.01	<1	15	<5	133	*	6	<10	<0.01	<1	<4	*		
105.9	119	Nelson Glacier	<10	*	153	0.09	>2000	64	12.08	<2	1.375	0.02	<1	0.30	2723	<0.01	2	<5	<5	146	*	2	30	<0.01	11	<4	*		
105.10	116	Nelson Glacier	389	*	<5	0.52	270.0	75	9.99	<2	1.252	0.11	3	0.60	2092	0.02	2	23	<5	21	*	11	10	0.05	61	<4	*		
105.10	8846	Nelson Glacier	63	*	<5	7.86	59.7	99	3.57	<2	0.014	0.03	1	0.38	3086	<0.01	4	<5	<5	<4	*	263	<10	<0.01	59	<4	*		
105.11	9580	Nelson Glacier	96	*	<5	1.09	13.4	135	6.15	11	<0.01	0.72	4	0.44	494	<0.01	2	48	<5	89	*	7	<10	<0.01	43	108	*		
105.11	9581	Nelson Glacier	<10	*	23	2.49	1039.4	140	5.98	4	0.086	0.05	<1	0.91	2416	0.01	3	8	<5	164	*	20	21	<0.01	26	<4	*		
105.12	8847	Nelson Glacier	182	*	<5	4.18	32.5	122	6.75	<2	0.015	0.08	6	0.64	2269	<0.01	2	<5	<5	<4	*	126	<10	<0.01	45	<4	*		
105.13	9582	Nelson Glacier	<10	*	42	3.88	1180.1	72	11.98	3	0.089	0.71	5	0.84	2993	<0.01	7	<5	<5	533	*	117	19	<0.01	101	<4	*		
105.13	9583	Nelson Glacier	321	*	24	0.07	1243.2	44	13.06	<2	0.105	0.07	<1	0.56	2408	<0.01	<1	12	<5	60	*	2	22	<0.01	13	<4	*		
105.14	129	Nelson Glacier	<10	*	58	0.66	841.2	137	19.30	<2	0.068	0.06	<1	0.10	2359	<0.01	<1	42	<5	904	*	16	27	<0.01	5	<4	*		
105.15	613	Nelson Glacier	<10	*	<5	0.06	69.6	128	>10	<2	0.176	0.02	<1	0.08	187	<0.01	<1	11	<5	13	*	6	<10	<0.01	14	<4	*		
105.15	8853	Nelson Glacier	67	*	<5	0.72	34.0	136	>10	<2	0.018	0.02	1	0.16	835	<0.01	<1	<5	<5	<4	*	25	<10	<0.01	11	<4	*		
105.16	8854	Nelson Glacier	751	*	<5	0.70	1.5	165	2.14	6	<0.01	0.38	3	0.91	361	0.01	2	<5	<5	<4	*	18	<10	0.02	39	<4	*		
105.17	9590	Nelson Glacier	129	*	<5	0.20	126.0	209	6.61	<2	<0.01	0.15	3	0.22	822	<0.01	<1	11	<5	134	*	5	<10	<0.01	17	<4	*		
105.18	9589	Nelson Glacier	<10	*	5	0.10	41.7	147	27.75	<2	0.089	0.06	<1	0.06	206	<0.01	<1	10	<5	9	*	10	<10	<0.01	<1	<4	*		
106.1	143	West Nelson Glacier	628	*	<5	0.50	4.2	223	1.58	<2	<0.01	0.16	5	0.55	1401	<0.01	5	<5	<5	<4	*	17	<10	<0.01	92	<4	*		
106.2	9602	West Nelson Glacier	97	*	<5	0.09	16.4	243	1.41	<2	<0.01	0.11	1	0.30	416	<0.01	1	<5	<5	<4	*	4	<10	<0.01	15	<4	*		
106.2	9603	West Nelson Glacier	<10	*	<5	4.82	95.9	57	15.22	<2	0.026	0.05	2	1.78	5741	<0.01	5	16	<5	27	*	172	<10	<0.01	108	<4	*		
107.1	2836	Huff	15	*	<5	20.60	<0.2	39	1.65	4	<0.01	0.02	<1	1.23	11980	0.04	<1	<5	<5	4	*	224	<10	<0.01	3	<4	*		
107.1	2837	Huff	297	*	<5	6.17	0.3	82	3.94	5	0.011	0.10	<1	1.64	6782	0.01	2	<5	7	<4	*	80	<10	<0.01	30	<4	*		
107.1	2838	Huff	1127	*	<5	0.14	0.3	26	10.96	<2	0.288	0.19	<1	0.21	380	0.03	<1	9	5	<4	*	11	<10	<0.01	22	12	*		
107.2	422	Huff	551	*	<5	1.26	1.0	82	2.58	6	0.018	0.21	<1	1.16	2237	<0.01	4	<5	13	<4	*	20	<10	<0.01	42	7	*		
107.2	423	Huff	197	*	<5	0.28	1.2	71	5.08	15	0.017	0.22	<1	3.02	2082	<0.01	15	12	18	<4	*	8	<10	<0.01	142	27	*		
107.2	424	Huff	313	*	<5	5.18	0.5	102	4.16	8	0.011	0.38	<1	2.65	4009	<0.01	7	<5	14	12	*	68	<10	<0.01	80	10	*		
107.2	425	Huff	157	*	<5	15.22	0.5	67	2.30	13	0.011	0.39	<1	1.86	5155	0.03	2	<5	5	<4	*	100	<10	<0.01	34	<4	*		
107.2	426	Huff	118	*	<5	9.57	0.5	44	2.75	7	<0.01	0.04	<1	2.30	3488	0.07	<1	<5	<5	<4	*	88	<10	<0.01	16	<4	*		
107.3	96	Huff	154	*	<5	0.10	2.0	127	8.64	<2	0.148	0.10	1	0.03	207	0.01	<1	75	<5	1295	*	15	<10	<0.01	22	<4	*		
107.3	97	Huff	<10	*	<5	24.18	4.7	10	2.74	<2	<0.01	0.01	5	0.90	>20000	<0.01	3	<5	<5	11	*	567	<10	<0.01	<1	<4	*		
107.3	261	Huff	3693	*	<5	0.05	<0.2	43	0.17	<2	<0.01	0.05	<1	0.02	74	0.05	2	<5	<5	<4	*	20	<10	<0.01	<1	<4	*		
107.3	262	Huff	164	*	<5	0.16	<0.2	155	0.30	<2	<0.01	0.02	2	0.06	345	<0.01	1	<5	<5	<4	*	4	<10	<0.01	2	<4	*		
107.3	420	Huff	38	*	<5	1.55	182.4	63	8.51	<2	0.057	0.03	<1	0.19	11087	<0.01	<1	23	<5	46	*	45	<10	<0.01	3	<4	*		
107.4	584	Huff	15	*	<5	0.49	253.8	141	>10	<2	0.075	<0.01	2	0.55	3542	<0.01	2	40	<5	339	*	5	<10	<0.01	68	<4	*		
107.5	92	Huff	2734	*	<5	0.86	5.5	124	3.74	<2	0.019	0.40	4	1.09	549	0.09	3	<5	10	<4	*	35	<10	0.10	133	<4	*		
107.6	93	Huff	1620	*	<5	2.02	0.4	106	13.81	<2	0.118	0.34	1	1.34	1090	0.04	<1	56	20	<4	*	64	<10	<0.01	140	11	*		
107.7	454	Huff	<10	*	<5	7.68	246.5	40	>10	4	0.070	<0.01	3	1.43	13907	<0.01	<1	23	6	153	*	247	37	<0.01	57	<4	*		
107.7	984	Huff	17	*	<5	4.31	235.1	34	>10	<2	0.075	<0.01	2	2.13	8917	<0.01	2	20	7	984	*	97	51	<0.01	94	8	*		
107.8	254	Huff	237	*	<5	0.02	525.9	<1	34.39	<2	0.205	0.02	<1	0.08	571	<0.01	<1	35	<5	76	*	2	<10	<0.01	7	127			
107.9	583	Huff	30	*	<5	0.78	1150.1	10	>10	<2	0.070	0.02	<1	0.26	1755	<0.01	<1	12	<5	49	*	18	29	<0.01	42	<4	*		
107.10	255	Huff	465	*	<5	2.28	366.1	13	26.16	<2	0.071	0.06	<1	0.18	1156	<0.01	<1	23	<5	87	*	52	15	<0.01	72	108			
107.11	91	Huff	<10	*	<5	0.76	382.9	11	35.27	<2	0.053	0.04	<1	0.14	963	<0.01	<1	64	<5	290	*	9	14	<0.01	8	96			
107.12	90	Huff	<10	*	<5	0.10	488.9	37	39.82	<2	0.094	<0.01	<1	0.59	813	<0.01	<1	<5	<5	198	*	4	<10	<0.01	19	125			
107.13	8828	Huff	318	*	<5	2.93	2.4	182	4.22	<2	0.014	0.12	2	1.61	736	<0.01	2	<5	<5	<4	*	304	<10	<0.01	36	<4	*		
107.14	8972	Huff	836	*	<5	2.17	3.2	202	>10	5	0.013	0.46	6	4.52	1597	0.06	45	<5	35	5	*	97	12	0.16	455	9	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
107.15	8708	Huff	R	S		OC	Lens of fest, sil gneiss w/ po in marble	<5		2.1		164		14		105		5	56	39	3.96	<5
107.16	256	Huff	R	Rep	4	OC	Marble w/ dissem sulf	<5		1.0		152		691		486		8	64	22	2.38	<5
107.17	257	Huff	R	Rep	1.7	OC	Irregular qz vn in heavily fest marble	<5		0.2		17		60		60		<1	4	<1	0.37	<5
107.18	258	Huff	R	Rep	2	OC	Fest marble w/ sulf	<5		0.6		90		354		261		6	41	11	2.52	<5
107.19	259	Huff	R	RC	1	OC	Alt intermediate intrusive w/ fg dissem po	<5		<0.1		100		25		34		<1	38	29	0.59	<5
108.1	9748	Glacier Basin	R	Rep	0.4	OC	Qz br vn	93		1.9		18		1095		25		8	3	1	2.23	574
108.2	1002	Glacier Basin	R	Rep		OC	Vuggy qz vn	555		68.1		929		565		140		20	18	5	1.69	594
108.3	1001	Glacier Basin	R	G	1	OC	Qz-fluorite vn	161		5.5		124		1378		2061		3	7	9	2.18	79
108.4	9746	Glacier Basin	R	G	0.5	RC	Qz-fluorite vn	611		2.9		24		386		109		8	2	2	0.88	1052
108.5	9747	Glacier Basin	R	G	0.4	OC	Qz rhyolite contact	<5		<0.1		7		25		34		2	3	<1	0.39	<5
108.6	1000	Glacier Basin	R	SC	50@1	RC	Fest sc	<5		0.4		23		71		82		3	6	3	0.79	<5
108.7	2608	Glacier Basin	R	S	1	OC	Lenses of sl, gn, py in sil volc	<5		3.97	*	500		4.64	*	7.90	*	10	21	52	3.08	4
108.7	2609	Glacier Basin	R	Rep	2	OC	Gn in sil volc	<5		7.98	*	6600		33.40	*	4.32	*	10	3	12	0.56	4
108.8	989	Glacier Basin	R	G		OC	Fest gneiss w/ 1/4" po band	7		3.1		30		170		94		4	11	4	3.15	43
108.8	8988	Glacier Basin	R	G	0.4	OC	Hbl sc w/ py	<5		2.1		575		24		120		3	14	56	2.51	<5
108.9	8874	Glacier Basin	R	S		FL	Fest gneiss w/ 50% qz & 10% py	<5		0.4		63		13		136		8	34	17	2.74	<5
108.9	8875	Glacier Basin	R	C	2	OC	Fest gneiss w/ py	<5		0.4		124		17		46		<1	31	24	2.13	<5
108.10	657	Glacier Basin	R	G	0.1	FL	Sil fest gneiss w/ py, gray sulf, cp	<5		0.4		152		64		154		2	23	18	1.40	<5
109.1	376	Lake	R	S	0.5	TP	Meta rock w/ sl, gn	<5		161.0		271		8.54	*	2.10	*	3	32	15	1.89	26
109.1	377	Lake	R	C	0.5	MD	Br qz w/ blebs of sl, gn, cp	14		195.0		2049		7.89	*	5.70	*	3	36	18	1.03	519
109.1	378	Lake	R	CH	0.25	TP	Msv gn, sl, cp	18		411.0		3266		25.10	*	3.60	*	3	26	20	1.45	16
109.1	379	Lake	R	S		MD	Qz br w/ py, sl, gn	<5		37.6		909		1.65	*	1.10	*	5	27	19	0.56	51
109.1	380	Lake	R	G		MD	Qz br w/ gn, sl	7		178.0		342		13.21	*	16.35	*	3	8	45	0.48	<5
109.1	2613	Lake	R	S		MD	Sil meta host w/ gn, sl, cp, py	<5		4.73	*	1300		10.50	*	6.60	*	10	18	19	2.12	42
109.1	9694	Lake	R	Rep	4.6	UW	Shear zone w/ qz br, phy, py, sl, gn	<5		10.3		289		1058		1.30	*	4	29	23	3.23	8
109.1	9695	Lake	R	Rep	3	UW	Shear zone w/ qz br, py, sl, gn	<5		1.7		38		820		717		3	115	30	4.31	37
109.1	9696	Lake	R	C	0.9	TP	Shear zone w/ qz, gn, sl, py, trace cp	<5		19.3		566		3500		19		2	15	31	1.74	11
110.1	2644	Berg Basin	R	G	0.4	FL	Qz vn w/ blebs of sl, gn, py	10		75.0		530		2.12	*	4.97	*	20	14	26	0.27	1060
111.1	372	Copper King	R	S	1.6	OC	Qz vn w/ py	679		2.1		20		7		41		4	23	9	0.85	151
111.1	373	Copper King	R	G		FL	Msv py w/ cp, sl	23		11.3		4849		35		2.70	*	31	60	128	0.78	<5
111.1	374	Copper King	R	C	0.7	OC	Irregular band of msv py, cp, sl w/ qz	39		18.9		5639		41		2.10	*	24	74	86	0.30	15
111.1	375	Copper King	R	S		MD	Alt intrusive w/ msv py, sl, lesser cp	16		12.0		4694		81		1.90	*	27	73	81	0.43	5
112.1	73	Berg	SS					<5		0.2		40		10		99		2	22	14	1.74	12
112.1	241	Berg	R	RC		FL	Qz peg cobbles in creek	<5		<0.1		14		20		41		1	5	<1	0.42	<5
113.4	575	Cone Mountain	R	RC		OC	Fest qz rhyolite w/ sparse clusters of po	13		<0.1		22		33		258		29	6	3	0.73	5
114.1	466	Black Crag	R	G	0.3	FL	Fest, qz-rich br w/ po	93		43.5		37		70		558		23	17	6	0.25	117
114.2	476	Black Crag	R	G	0.2	FL	Felsite w/ mo along fractures	<5		0.2		75		19		44		1348	3	<1	0.19	<5
114.2	479	Black Crag	R	G	1	FL	Fest, sil volc w/ py cubes	<5		2.0		58		17		6		6	7	<1	<0.01	36
114.2	480	Black Crag	R	G	0.4	FL	Fg fel intrusive w/ qz-mo seam	<5		1.2		187		18		167		735	4	<1	0.50	<5
114.2	624	Black Crag	R	G	0.3	FL	Qz eye rhyolite w/ mo	6		0.4		13		108		713		23	5	2	0.97	<5
114.2	625	Black Crag	R	G		FL	Mo fracture coating in volc rock	24		1.4		69		195		437		802	9	2	0.58	6
114.2	649	Black Crag	R	G	0.5	FL	Sil fel volc w/ 20% py	40		0.9		9		156		118		7	2	1	0.80	23
114.2	651	Black Crag	R	G		FL	Fest sil rhyolite br w/ fg sulf	42		5.2		13		48		65		13	11	3	0.64	26
114.2	8731	Black Crag	R	G		FL	Gray, fest, sil volc w/ fg py lenses & pods	110		9.0		25		16		206		4	2	6	0.46	336
114.2	8733	Black Crag	R	S		FL	Sil, fest int w/ py, cp	<5		1.8		1508		4		77		43	57	60	0.61	<5
114.2	8734	Black Crag	R	RC	5	OC	Maroon, very fg hornfels w/ minor po, py	<5		<0.1		56		10		108		8	15	11	2.45	<5
114.2	8860	Black Crag	R	G		RC	Silica-rich volc or meta rock	7		0.5		65		104		119		2529	7	3	0.83	<5
114.2	8861	Black Crag	R	G		FL	Hbl rhyolite br	233		0.3		15		20		368		2098	6	4	0.82	12
114.3	8732	Black Crag	R	S		RC	Fest granite w/ very fg dissem py	<5		<0.1		8		33		48		15	4	<1	0.32	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
107.15	8708	Huff	1636	*	<5	2.38	0.9	52	7.86	6	<0.01	0.31	<1	1.21	244	0.29	<1	<5	<5	<4	*	95	<10	0.14	110	<4	*		
107.16	256	Huff	2222	*	<5	2.55	3.5	29	4.82	2	<0.01	0.08	6	0.45	108	0.18	3	<5	<5	<4	*	73	<10	0.04	28	<4	*		
107.17	257	Huff	1964	*	<5	0.07	0.3	54	0.79	<2	<0.01	0.14	8	0.20	152	0.04	2	<5	<5	<4	*	4	<10	0.04	20	<4	*		
107.18	258	Huff	1418	*	<5	0.83	2.0	129	4.71	<2	<0.01	0.91	2	1.37	571	0.22	5	<5	14	<4	*	54	<10	0.26	197	<4	*		
107.19	259	Huff	2794	*	<5	0.58	0.2	22	3.46	<2	<0.01	0.05	<1	0.57	198	0.08	<1	<5	6	<4	*	3	<10	0.10	65	<4	*		
108.1	9748	Glacier Basin	148	*	<5	3.47	2.2	157	0.97	13	<0.01	1.06	3	0.21	50	0.02	4	<5	<5	41	*	9	<10	<0.01	51	13	*		
108.2	1002	Glacier Basin	315	*	27	0.91	2.7	129	3.64	10	0.016	0.71	6	0.32	375	<0.01	3	10	<5	103	*	7	<10	<0.01	49	13	*		
108.3	1001	Glacier Basin	113	*	<5	6.60	10.2	73	5.51	7	<0.01	0.39	4	0.37	2845	0.10	2	<5	<5	439	*	22	<10	0.01	38	11	*		
108.4	9746	Glacier Basin	58	*	<5	7.74	5.0	105	1.10	6	<0.01	0.57	4	0.08	267	0.27	<1	<5	<5	58	*	37	<10	<0.01	10	10	*		
108.5	9747	Glacier Basin	622	*	<5	0.10	<0.2	102	0.41	3	<0.01	0.14	1	0.05	78	0.08	3	<5	<5	7	*	8	<10	<0.01	2	9	*		
108.6	1000	Glacier Basin	2931	*	<5	0.33	<0.2	63	1.39	<2	0.045	0.19	3	0.31	607	0.07	2	<5	<5	29	*	20	<10	0.07	26	9	*		
108.7	2608	Glacier Basin	30		230	3.69	>100.0	103	4.16	<10	0.080	1.42	<10	0.48	2670	0.74		6	1			114		<.01	41	10			
108.7	2609	Glacier Basin	30		16	0.48	>100.0	24	5.03	<10	0.010	0.07	10	0.07	850	0.07		140	1			32		0.03	17	10			
108.8	989	Glacier Basin	747	*	<5	5.15	0.7	158	2.09	11	0.027	1.35	4	0.46	134	0.02	8	<5	<5	7	*	35	<10	0.03	87	7	*		
108.8	8988	Glacier Basin	220	*	<5	1.54	0.9	21	>10	4	0.018	0.08	2	1.57	479	0.15	16	<5	11	<4	*	32	<10	0.53	195	11	*		
108.9	8874	Glacier Basin	1610	*	<5	0.79	0.4	166	4.09	4	0.010	1.05	3	1.15	329	0.15	8	<5	11	<4	*	44	<10	0.17	128	<4	*		
108.9	8875	Glacier Basin	480	*	<5	0.92	<0.2	80	4.01	<2	<0.01	0.34	2	2.18	273	0.17	6	<5	9	<4	*	10	<10	0.09	104	<4	*		
108.10	657	Glacier Basin	644	*	<5	1.00	0.9	104	2.68	<2	<0.01	0.43	5	1.68	277	0.10	5	<5	5	<4	*	13	<10	0.16	67	<4	*		
109.1	376	Lake	195	*	<5	3.14	360.7	163	4.94	3	0.063	0.16	7	0.96	3823	<0.01	<1	103	6	18	*	42	<10	<0.01	47	<4	*		
109.1	377	Lake	212	*	<5	0.03	634.0	122	4.85	<2	0.113	0.16	5	0.33	816	<0.01	<1	50	<5	30	*	4	<10	<0.01	34	<4	*		
109.1	378	Lake	90	*	<5	0.06	406.2	142	5.33	<2	0.075	0.06	3	0.55	1685	<0.01	1	186	<5	51	*	5	<10	0.02	65	<4	*		
109.1	379	Lake	333	*	20	0.33	120.0	184	2.47	<2	0.051	0.12	5	0.14	410	0.01	1	8	<5	<4	*	4	<10	0.01	90	<4	*		
109.1	380	Lake	216	*	92	<0.01	1649.3	109	4.25	<2	0.508	0.13	<1	0.12	762	<0.01	<1	70	<5	35	*	3	19	<0.01	23	<4	*		
109.1	2613	Lake	10		24	3.24	>100.0	78	6.38	<10	0.190	0.13	<10	0.81	4440	<.01		64	3			122		0.01	81	<10			
109.1	9694	Lake	1059	*	<5	5.02	119.6	105	7.72	4	0.787	0.33	7	2.27	3388	0.04	1	<5	14	8	*	140	<10	0.09	223	<4	*		
109.1	9695	Lake	217	*	<5	5.50	5.9	440	7.09	5	0.086	0.15	11	4.18	4463	<0.01	2	<5	16	<4	*	211	<10	<0.01	129	<4	*		
109.1	9696	Lake	357	*	<5	0.10	1716.7	74	8.05	<2	0.288	0.09	1	0.65	2463	<0.01	2	<5	<5	22	*	5	11	0.02	86	<4	*		
110.1	2644	Berg Basin	20		<2	0.02	>100.0	206	4.55	<10	0.050	0.09	<10	0.08	245	<.01		16	<1			<1		<.01	17	<10			
111.1	372	Copper King	306	*	<5	1.73	0.5	226	2.15	2	<0.01	0.08	2	0.81	485	<0.01	<1	<5	15	<4	*	33	<10	<0.01	44	<4	*		
111.1	373	Copper King	373	*	<5	0.60	483.7	57	>10	<2	0.391	0.09	<1	0.71	436	0.01	<1	<5	<5	22	*	11	<10	<0.01	45	<4	*		
111.1	374	Copper King	1040	*	<5	0.02	381.4	53	>10	<2	0.605	0.09	<1	0.17	41	0.02	<1	<5	<5	26	*	2	<10	<0.01	7	<4	*		
111.1	375	Copper King	1004	*	<5	1.16	286.1	24	>10	<2	0.458	0.08	<1	0.42	583	0.01	<1	<5	<5	20	*	18	<10	<0.01	16	<4	*		
112.1	73	Berg	1952	*	<5	0.67	0.3	39	3.05	4	0.020	0.33	9	1.18	426	0.03	3	<5	<5	<4	*	26	<10	0.14	61	<4	*		
112.1	241	Berg	899	*	<5	0.50	<0.2	87	0.55	<2	<0.01	0.18	2	0.08	102	0.06	3	<5	<5	<20		9	<10	0.01	7	<20			
113.4	575	Cone Mountain	37	*	<5	0.04	3.0	117	2.44	5	<0.01	0.37	42	0.01	57	0.02	14	<5	<5	7	*	2	<10	0.01	2	12	*		
114.1	466	Black Crag	87	*	<5	0.02	4.0	94	>10	<2	0.572	0.15	5	0.01	29	<0.01	26	<5	<5	5	*	<1	<10	0.01	4	6	*		
114.2	476	Black Crag	<10	*	<5	<0.01	1.6	120	0.66	<2	<0.01	0.15	6	<0.01	24	0.07	<1	<5	<5	<4	*	<1	<10	0.02	<1	5	*		
114.2	479	Black Crag	41	*	<5	<0.01	<0.2	176	9.61	<2	<0.01	<0.01	2	<0.01	21	<0.01	20	<5	<5	8	*	1	<10	0.04	2	<4	*		
114.2	480	Black Crag	194	*	<5	0.77	2.2	178	1.69	<2	<0.01	0.35	130	0.08	186	0.26	53	<5	<5	6	*	27	<10	0.08	14	21	*		
114.2	624	Black Crag	<10	*	<5	0.79	1.2	254	2.48	6	<0.01	0.04	20	0.08	117	0.50	19	<5	<5	45	*	19	<10	0.04	9	12	*		
114.2	625	Black Crag	216	*	<5	0.32	8.3	204	2.22	3	<0.01	0.54	62	0.06	340	0.19	25	<5	<5	9	*	15	<10	0.07	5	<4	*		
114.2	649	Black Crag	173	*	<5	<0.01	<0.2	104	>10	2	0.013	0.41	<1	<0.01	25	0.02	12	<5	<5	16	*	1	<10	<0.01	3	5	*		
114.2	651	Black Crag	275	*	<5	0.13	<0.2	179	2.11	3	0.020	0.38	16	0.03	51	0.02	4	<5	<5	<4	*	4	<10	0.03	7	13	*		
114.2	8731	Black Crag	4344	*	<5	0.49	0.2	36	7.13	<2	0.030	0.27	23	0.04	64	<0.01	2	<5	<5	<4	*	5	<10	0.06	3	13	*		
114.2	8733	Black Crag	16	*	<5	0.05	<0.2	58	>10	2	<0.01	0.59	11	0.03	54	0.04	10	<5	<5	<4	*	7	<10	0.02	7	8	*		
114.2	8734	Black Crag	532	*	<5	0.15	0.3	62	4.42	10	<0.01	1.23	14	1.43	702	0.11	<1	<5	10	6	*	9	<10	0.24	69	8	*		
114.2	8860	Black Crag	236	*	<5	0.46	1.1	364	2.13	3	<0.01	0.55	73	0.04	186	0.23	10	<5	<5	<4	*	12	<10	0.04	5	11	*		
114.2	8861	Black Crag	24	*	<5	0.26	0.7	239	3.67	8	<0.01	1.03	536	0.16	408	0.21	76	<5	<5	<4	*	11	<10	0.11	10	15	*		
114.3	8732	Black Crag	225	*	<5	<0.01	<0.2	155	1.35	4	<0.01	0.15	13	0.02	24	0.06	<1	<5	<5	<4	*	<1	<10	<0.01	4	5	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
115.1	2844	Craig River	R	G	0.5	OC	Qz vn w/ py	35		0.6		280		<2		33		2	8	118	1.22	5
115.1	3736	Craig River	R	G		RC	Msv py in qz & metaseds	17		0.3		46		3		10		478	13	96	0.38	8
115.1	3746	Craig River	R	C	2.2	OC	Gossan w/ qz at margins of marble	41		<0.1		121		<2		10		11	11	26	0.20	9
115.1	3747	Craig River	R	S		RC	Sil skarn w/ msv py, po	37		2.3		1781		3		19		8	26	24	0.34	<5
116.1	2840	Craig Claims	R	C	0.7	OC	Metaseds w/ po	<5		0.2		266		5		36		42	219	41	2.66	<5
116.1	2841	Craig Claims	R	C	1.1	OC	Fest metaseds	<5		0.3		371		<2		18		10	31	35	1.34	<5
116.1	3741	Craig Claims	R	RC		OC	Skarn w/ py in metaseds	8		2.7		1277		17		2288		58	351	91	0.97	<5
116.2	3737	Craig Claims	R	G		RC	Sil sc w/ py, minor cp	<5		<0.1		213		5		6		91	19	9	0.31	<5
116.2	3738	Craig Claims	R	Rep		RC	Py, po, minor cp in metaseds	8		1.2		1273		5		45		12	106	37	1.64	<5
116.2	3739	Craig Claims	R	G		RC	Py in skarn	<5		0.5		560		<2		11		3	54	36	0.69	<5
116.2	3740	Craig Claims	R	G		RC	Msv py, po, cp in hornblendite	30		9.2		5706		79		3.05	*	8	119	47	0.39	9
117.1	473	North Bradfield River Skarn	R	G	0.5	RC	Fest, sil rock w/ po, cp	<5		1.0		539		4		47		12	32	28	0.49	<5
117.1	8726	North Bradfield River Skarn	R	G		RC	Sil gneiss w/ dissem po, trace cp on fracture	<5		0.7		398		7		57		3	26	25	0.64	<5
117.2	2860	North Bradfield River Skarn	R	G		RC	Skarn w/ po, cp	25		1.7		2084		3		139		2	34	81	1.46	8
117.2	2861	North Bradfield River Skarn	R	G		RC	Skarn w/ po, cp	164		2.4		3739		<2		182		3	43	129	0.19	<5
117.3	455	North Bradfield River Skarn	R	G	0.3	RC	Msv po w/ cp	26		1.3		1540		27		236		2	31	84	0.64	<5
117.3	456	North Bradfield River Skarn	R	Rep	2	OC	Hbl w/ po, mag, cp	115		8.7		1.30	*	9		178		2	56	155	1.17	<5
117.4	471	North Bradfield River Skarn	R	C	2	TP	Fest mag	190		1.2		1482		<2		151		3	12	19	0.40	<5
117.4	8725	North Bradfield River Skarn	R	S		RC	Msv mag	32		0.9		820		<2		53		4	7	16	0.33	<5
117.5	1011	North Bradfield River Skarn	R	CC	1	OC	Skarn w/ gray sulf	<5		0.6		71		<2		96		23	41	9	0.97	<5
117.5	9751	North Bradfield River Skarn	R	CC	0.2	OC	Fest sil band w/ dissem py	<5		1.1		116		19		190		31	343	74	1.27	9
117.6	1009	North Bradfield River Skarn	SS					<5		<0.2		14		4		45		<1	7	6	1.19	<5
117.6	1010	North Bradfield River Skarn	SS					<5		<0.2		14		3		46		<1	7	6	1.29	<5
117.6	9749	North Bradfield River Skarn	SS					<5		<0.2		14		3		53		<1	7	7	1.15	<5
117.6	9750	North Bradfield River Skarn	SS					<5		<0.2		12		2		42		<1	6	5	1.05	<5
117.7	8727	North Bradfield River Skarn	R	Rep	1	RC	Very fg, fest, msv garnet w/ py, cp	6		0.8		2664		5		31		10	51	225	0.91	<5
117.7	8728	North Bradfield River Skarn	R	Rep	1	OC	Bt sc w/ py, po	<5		0.4		121		11		45		3	75	23	2.59	<5
117.7	8729	North Bradfield River Skarn	R	S	0.8	FL	Very fg, fest, msv garnet w/ py, cp	26		1.2		3606		3		50		168	81	65	1.04	<5
117.8	475	North Bradfield River Skarn	R	G	0.6	FL	Qz-cc-garnet skarn w/ po, cp	26		2.1		6629		<2		33		8	25	88	1.02	<5
117.9	474	North Bradfield River Skarn	R	G	0.5	FL	Msv mag w/ bands of po, cp	34		0.4		809		<2		112		3	11	136	0.14	<5
117.10	487	North Bradfield River Skarn	R	SC	18@.25	TP	Tactite w/ mag, po, cp	69		1.0		870		<2		39		6	14	49	1.06	<5
117.10	488	North Bradfield River Skarn	R	SC	18@.25	TP	Tactite w/ mag, po, cp	14		1.1		844		<2		38		4	12	40	0.51	<5
117.11	481	North Bradfield River Skarn	R	C	1	OC	Fest, sil gneiss w/ dissem mag, py	<5		0.3		36		<2		45		220	21	4	0.65	<5
117.12	472	North Bradfield River Skarn	R	S	0.4	RC	Hbl, mag, po, cp	60		1.5		3073		3		53		4	74	146	2.01	<5
117.12	604	North Bradfield River Skarn	R	G	0.4	RC	Fest gneiss w/ garnet, mag, cp	212		5.0		2930		203		283		6	9	19	3.37	<5
117.12	8845	North Bradfield River Skarn	R	S		RC	Fest gneiss w/ magnetite, cp	44		1.0		1401		46		87		4	3	13	2.05	<5
117.13	602	North Bradfield River Skarn	R	C	0.8	TP	Fest gneiss w/ po, py, cp	85		2.6		798		81		259		4	8	32	3.20	<5
117.13	603	North Bradfield River Skarn	R	SC	16@.5	TP	Fest gneiss w/ mag, po, cp	21		1.3		2083		46		100		8	11	33	5.87	<5
117.13	8844	North Bradfield River Skarn	R	SC	20@.5	TP	Fest garnet gneiss w/ cp	31		1.1		1679		51		107		6	27	51	4.50	<5
117.14	484	North Bradfield River Skarn	R	C	4.5	TP	Msv garnet skarn w/ streaks of cp, dissem po	93		1.7		3316		4		40		7	45	72	3.92	<5
117.15	482	North Bradfield River Skarn	R	G	0.9	RC	Fest, sil gneiss w/ mal, cp	289		1.6		2586		<2		18		8	28	127	2.29	7
117.15	483	North Bradfield River Skarn	R	C	1.2	OC	Gossan w/ po, cp	19		3.4		3307		<2		37		100	51	74	1.84	<5
117.16	8735	North Bradfield River Skarn	R	C	2.3	TP	Msv mag w/ po, cp replacing marble	136		2.9		3351		<2		64		4	17	62	0.59	<5
117.16	8736	North Bradfield River Skarn	R	C	7.6	TP	Msv mag w/ fg - mg, euhedral garnet in marble	95		1.2		658		<2		32		6	8	29	0.66	<5
117.17	8737	North Bradfield River Skarn	R	SC	10.5@.5	OC	Msv mag w/ garnet, trace cp in marble	281		1.6		623		<2		47		3	6	22	1.13	<5
117.18	8738	North Bradfield River Skarn	R	SC	10.5@.5	OC	Msv mag & garnet in marble	121		2.5		1481		<2		42		3	4	14	0.82	<5
117.19	2645	North Bradfield River Skarn	R	Rep	8	OC	Mag & hematite band	3600		11.6		1130		6		150		3	4	18	0.53	2
117.20	2646	North Bradfield River Skarn	R	C	0.8	OC	Fest qz lens w/ mag	1360		3.4		2200		27		95		3	8	17	1.29	<2
118.1	463	Mt Lewis Cass	R	G		FL	Fest metamorphic rock w/ po, cp	41		1.3		1832		3		29		3	36	68	0.91	7

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
115.1	2844	Craig River	1314	*	<5	0.59	<0.2	151	6.17	4	<0.01	0.17	2	0.59	215	0.09	<1	<5	<5	<4	*	33	<10	0.12	63	<4	*		
115.1	3736	Craig River	543	*	<5	0.28	<0.2	100	>10	<2	<0.01	0.04	1	0.03	30	0.04	<1	<5	<5	13	*	12	11	0.13	19	<4	*		
115.1	3746	Craig River	24	*	<5	0.28	<0.2	193	>10	<2	<0.01	0.02	<1	0.06	87	<0.01	<1	<5	<5	<4	*	8	<10	0.02	69	7	*		
115.1	3747	Craig River	17	*	<5	2.88	<0.2	61	>10	<2	0.021	<0.01	<1	0.10	217	<0.01	<1	<5	<5	14	*	17	17	0.01	13	<4	*		
116.1	2840	Craig Claims	829		<5	1.78	<0.2	310	4.42	3	<0.01	0.85	1	1.94	306	0.19	<1	<5	5	79		106	<10	0.19	131	<20	*		
116.1	2841	Craig Claims	147		<5	1.60	<0.2	58	4.13	3	<0.01	0.09	<1	0.58	231	0.19	<1	<5	6	9		84	<10	0.33	73	<20	*		
116.1	3741	Craig Claims	454	*	<5	1.11	33.9	62	>10	2	<0.01	0.09	1	0.31	219	0.04	<1	<5	<5	<4	*	26	<10	0.06	73	<4	*		
116.2	3737	Craig Claims	3042	*	<5	0.19	<0.2	145	1.38	<2	<0.01	0.11	3	0.12	91	0.11	3	<5	<5	<4	*	43	<10	0.05	16	8	*		
116.2	3738	Craig Claims	1219	*	<5	1.56	0.6	143	5.42	3	<0.01	0.30	<1	0.79	262	0.16	<1	<5	<5	<4	*	81	<10	0.22	69	<4	*		
116.2	3739	Craig Claims	<10	*	<5	5.04	<0.2	128	9.04	2	<0.01	<0.01	<1	0.03	1292	<0.01	<1	<5	<5	<4	*	10	<10	0.05	149	<4	*		
116.2	3740	Craig Claims	163	*	<5	1.12	296.1	41	>10	3	1.200	0.02	4	0.14	735	0.02	<1	<5	<5	108	*	23	19	0.13	47	<4	*		
117.1	473	North Bradfield River Skarn	1632	*	<5	0.72	0.7	67	5.55	<2	<0.01	0.15	4	0.40	117	0.07	<1	<5	<5	<4	*	20	<10	0.13	47	7	*		
117.1	8726	North Bradfield River Skarn	2016	*	<5	0.49	0.5	70	4.37	<2	<0.01	0.10	3	0.46	139	0.05	<1	<5	<5	<4	*	15	<10	0.09	52	<4	*		
117.2	2860	North Bradfield River Skarn	323	*	<5	1.46	0.4	29	>10	4	<0.01	0.09	3	0.22	645	0.10	<1	<5	<5	26	*	65	15	0.08	142	<4	*		
117.2	2861	North Bradfield River Skarn	<10	*	<5	1.16	0.9	10	>10	3	<0.01	<0.01	2	0.14	526	<0.01	<1	<5	<5	37	*	6	21	<0.01	37	<4	*		
117.3	455	North Bradfield River Skarn	12	*	<5	0.63	0.6	16	>10	<2	<0.01	0.03	2	0.14	808	0.02	<1	<5	<5	29	*	20	16	0.04	87	5	*		
117.3	456	North Bradfield River Skarn	107	*	<5	1.86	1.9	64	>10	<2	0.018	0.09	2	0.40	634	0.08	<1	<5	<5	17	*	52	12	0.05	63	<4	*		
117.4	471	North Bradfield River Skarn	<10	*	<5	0.22	<0.2	9	>10	<2	<0.01	<0.01	3	0.07	632	<0.01	<1	<5	<5	37	*	5	19	<0.01	65	<4	*		
117.4	8725	North Bradfield River Skarn	<10	*	<5	0.04	<0.2	6	>10	4	<0.01	<0.01	1	0.06	488	<0.01	<1	<5	<5	31	*	2	11	<0.01	262	<4	*		
117.5	1011	North Bradfield River Skarn	1813	*	<5	1.39	1.1	113	3.05	<2	0.014	0.15	14	0.20	62	0.16	7	<5	<5	<4	*	72	<10	0.14	73	8	*		
117.5	9751	North Bradfield River Skarn	2669	*	<5	2.02	1.7	70	7.41	<2	<0.01	0.19	35	0.23	60	0.14	7	<5	<5	<4	*	50	<10	0.21	73	6	*		
117.6	1009	North Bradfield River Skarn	2044	*	<5	0.94	<0.2	10	2.80	<2	<0.01	0.14	9	0.39	377	0.04	6	<5	<5	<20		156	<10	0.09	62	<20			
117.6	1010	North Bradfield River Skarn	1959	*	<5	0.94	<0.2	9	2.45	<2	<0.01	0.15	8	0.41	356	0.04	5	<5	<5	<20		168	<10	0.09	54	<20			
117.6	9749	North Bradfield River Skarn	1925	*	<5	1.00	<0.2	10	5.22	2	<0.01	0.12	13	0.37	480	0.04	7	<5	<5	<20		129	<10	0.09	102	<20			
117.6	9750	North Bradfield River Skarn	2130	*	<5	0.85	<0.2	9	2.71	<2	<0.01	0.12	12	0.35	369	0.04	4	<5	<5	<20		127	<10	0.09	56	<20			
117.7	8727	North Bradfield River Skarn	11	*	<5	6.26	0.6	86	>10	3	<0.01	<0.01	3	0.05	1554	<0.01	<1	<5	<5	11	*	3	<10	0.03	34	<4	*		
117.7	8728	North Bradfield River Skarn	450	*	<5	3.29	<0.2	58	2.82	6	<0.01	0.07	13	0.74	186	0.16	<1	<5	<5	5	*	228	<10	0.12	29	6	*		
117.7	8729	North Bradfield River Skarn	69	*	<5	6.05	1.2	104	>10	2	<0.01	<0.01	1	0.09	1804	<0.01	<1	<5	<5	7	*	3	<10	0.05	42	9	*		
117.8	475	North Bradfield River Skarn	14	*	<5	5.96	0.9	109	>10	4	0.014	0.01	2	0.04	1371	0.01	<1	<5	<5	5	*	5	<10	0.02	24	<4	*		
117.9	474	North Bradfield River Skarn	<10	*	<5	0.17	<0.2	17	>10	<2	<0.01	<0.01	2	0.05	634	<0.01	<1	<5	<5	36	*	3	14	<0.01	26	<4	*		
117.10	487	North Bradfield River Skarn	714	*	<5	2.56	<0.2	50	>10	3	<0.01	0.05	4	0.12	702	0.04	<1	<5	<5	14	*	46	12	0.04	95	10	*		
117.10	488	North Bradfield River Skarn	<10	*	<5	2.24	<0.2	42	>10	5	<0.01	0.04	3	0.12	713	0.02	<1	<5	<5	29	*	18	14	0.03	185	<4	*		
117.11	481	North Bradfield River Skarn	1204	*	<5	1.03	0.4	153	1.79	<2	<0.01	0.09	5	0.14	58	0.09	<1	<5	<5	<4	*	49	<10	0.06	25	<4	*		
117.12	472	North Bradfield River Skarn	<10	*	<5	3.67	0.4	59	>10	3	<0.01	<0.01	<1	0.07	1112	0.04	<1	<5	<5	11	*	102	12	0.07	80	<4	*		
117.12	604	North Bradfield River Skarn	89	*	<5	3.44	0.3	52	>10	3	<0.01	0.17	2	0.60	1341	0.18	7	<5	<5	6	*	156	<10	0.08	95	<4	*		
117.12	8845	North Bradfield River Skarn	<10	*	<5	3.54	0.3	26	>10	<2	<0.01	0.03	<1	0.13	1286	0.04	6	<5	<5	10	*	79	<10	0.07	122	<4	*		
117.13	602	North Bradfield River Skarn	<10	*	<5	5.17	1.7	66	6.54	<2	0.011	0.03	<1	0.28	1023	0.02	8	<5	5	7	*	121	<10	0.11	115	<4	*		
117.13	603	North Bradfield River Skarn	228	*	<5	6.51	<0.2	70	6.20	<2	<0.01	0.05	4	0.13	1263	0.26	9	<5	<5	5	*	267	<10	0.14	103	6	*		
117.13	8844	North Bradfield River Skarn	546	*	<5	5.25	1.0	42	5.41	3	0.011	0.05	2	0.12	965	0.12	3	<5	<5	<4	*	211	<10	0.09	71	<4	*		
117.14	484	North Bradfield River Skarn	260	*	<5	5.37	0.6	54	6.24	5	<0.01	0.03	3	0.09	680	0.14	<1	<5	<5	<4	*	193	13	0.08	60	<4	*		
117.15	482	North Bradfield River Skarn	43	*	<5	3.67	<0.2	51	9.34	2	<0.01	<0.01	2	0.11	611	0.02	<1	<5	<5	<4	*	69	<10	0.07	46	<4	*		
117.15	483	North Bradfield River Skarn	104	*	<5	4.61	0.7	53	>10	4	<0.01	0.01	2	0.16	1308	0.04	<1	<5	<5	15	*	35	11	0.07	168	4	*		
117.16	8735	North Bradfield River Skarn	303	*	<5	1.22	<0.2	11	>10	<2	0.011	0.02	2	0.08	518	0.01	<1	<5	<5	31	*	6	20	0.02	30	<4	*		
117.16	8736	North Bradfield River Skarn	16	*	<5	2.21	<0.2	20	>10	<2	<0.01	0.04	<1	0.05	823	0.01	<1	<5	<5	24	*	8	15	0.02	32	24	*		
117.17	8737	North Bradfield River Skarn	283	*	<5	1.26	0.3	15	>10	2	<0.01	0.06	2	0.13	494	0.06	<1	<5	<5	24	*	56	11	0.03	39	<4	*		
117.18	8738	North Bradfield River Skarn	99	*	<5	1.81	<0.2	25	>10	<2	<0.01	0.02	2	0.05	709	0.03	<1	<5	<5	21	*	28	12	0.02	29	8	*		
117.19	2645	North Bradfield River Skarn	10		<2	0.51	1.5	21	>15.00	20	0.050	0.01	<10	0.02	670	<.01		<2	<1			9		0.01	36	<10			
117.20	2646	North Bradfield River Skarn	10		<2	4.83	1.5	226	5.37	<10	0.020	<.01	<10	0.04	865	<.01		<2	1			7		0.02	40	<10			
118.1	463	Mt Lewis Cass	59	*	<5	4.18	0.3	100	8.09	<2	0.012	0.07	<1	0.16	625	0.07	<1	<5	<5	<4	*	51	<10	0.05	20	82	*		

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	* opt	Ag ppm	* opt	Cu ppm	* %	Pb ppm	* %	Zn ppm	* %	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
118.1	464	Mt Lewis Cass	R	G	0.3	FL	Sil metamorphic rock w/ vuggy qz	28		0.9		74		3		12		15	6	2	0.41	104
118.2	470	Mt Lewis Cass	R	G	0.4	RC	Band of fest, sil marble & sc w/ py	<5		1.5		60		11		16		31	23	4	0.02	<5
118.2	8717	Mt Lewis Cass	R	S		FL	Boulder of metaseds w/ cp, po, mag in 1.5" vn	289		17.6		1.33	*	9		203		29	15	24	3.19	<5
118.2	8718	Mt Lewis Cass	R	C	0.3	OC	Qz vn w/ dissem mo in intrusive	<5		0.3		46		14		20		1240	11	2	0.22	<5
118.2	8723	Mt Lewis Cass	R	Rep	0.5	OC	Fest granulite w/ dissem po, trace cp	<5		0.5		198		4		62		4	44	23	0.49	<5
118.2	8724	Mt Lewis Cass	R	Rep	5	OC	Purple, heavily fest granulite w/ dissem po	18		0.6		122		5		84		7	27	15	3.09	31
119.1	2845	Upper Marten Lake	R	Rep		OC	Qz vn	<5		0.3		26		4		119		6	24	3	0.54	<5
119.1	2846	Upper Marten Lake	R	C	3	OC	Fault gouge	<5		0.6		80		7		188		14	32	7	1.65	<5
119.1	2847	Upper Marten Lake	R	G		OC	Fest zone	475		86.9		44		1218		418		8	25	6	0.96	<5
119.1	3748	Upper Marten Lake	R	S		OC	Fest qz in shear w/ minor py, po	<5		0.2		62		5		91		6	17	3	0.81	<5
120.1	3929	Bradfield Canal Shear	R	C	1.2	TP	Qz vn in sc/gneiss w/ po, cp	17		1.8		197		33		34		4	48	24	0.24	<5
120.1	3930	Bradfield Canal Shear	R	C	0.6	TP	Qz vn w/ minor sulf	<5		0.3		38		9		235		7	23	7	0.36	<5
120.1	3931	Bradfield Canal Shear	R	Rep	0.8	TP	Qz vn in qz-mica gneiss	<5		0.5		20		17		54		4	14	3	0.31	<5
120.1	3932	Bradfield Canal Shear	R	S		MD	Qz w/ po, py, cp	31		3.1		178		29		25		6	54	26	0.17	<5
121.1	66	Bradfield River	SS					<5		<0.1		19		9		74		1	10	15	1.58	<5
121.1	67	Bradfield River	SS					<5		0.1		25		8		74		2	10	12	1.57	<5
121.1	234	Bradfield River	SS					<5		0.1		24		8		69		<1	9	10	1.42	<5
121.1	235	Bradfield River	SS					<5		0.1		25		9		70		1	9	11	1.46	<5
121.2	68	Bradfield River	SS					<5		<0.1		15		6		38		<1	4	7	0.74	<5
121.2	69	Bradfield River	SS					<5		<0.1		17		7		33		<1	4	6	0.69	<5
121.2	236	Bradfield River	SS					<5		<0.1		16		5		35		<1	5	7	0.78	<5
121.2	237	Bradfield River	SS					<5		<0.1		11		7		52		<1	3	7	0.39	<5
121.3	70	Bradfield River	SS					<5		<0.1		13		9		55		<1	3	9	0.35	<5
121.3	71	Bradfield River	SS					<5		<0.1		19		6		37		<1	5	7	0.82	<5
121.3	238	Bradfield River	SS					10		<0.1		10		7		90		<1	2	14	0.18	<5
121.3	239	Bradfield River	SS					<5		<0.1		17		6		32		<1	4	7	0.65	<5

Table B-1. Analytical results of samples from mines prospects and occurences

Map no.	Sample no.	Location	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf	Pt ppb	Pd ppb
118.1	464	Mt Lewis Cass	1677	*	<5	1.62	<0.2	108	1.16	<2	<0.01	0.15	9	0.32	173	0.06	<1	<5	<5	<4	*	22	<10	0.10	57	<4	*		
118.2	470	Mt Lewis Cass	<10	*	<5	0.18	<0.2	240	7.27	<2	0.016	<0.01	1	0.12	57	<0.01	<1	<5	<5	<4	*	1	<10	<0.01	2	5	*		
118.2	8717	Mt Lewis Cass	582	*	58	1.79	9.8	59	5.91	6	<0.01	0.97	2	0.92	702	0.29	<1	<5	6	<4	*	119	10	0.27	93	36	*		
118.2	8718	Mt Lewis Cass	1416	*	<5	0.12	0.2	251	1.06	<2	<0.01	0.08	4	0.04	135	0.05	<1	<5	<5	<4	*	32	<10	0.02	3	<4	*		
118.2	8723	Mt Lewis Cass	<10	*	<5	0.22	0.4	266	9.11	<2	<0.01	0.06	2	0.22	101	0.02	1	<5	<5	<4	*	5	<10	0.03	13	<4	*		
118.2	8724	Mt Lewis Cass	1529	*	<5	2.32	0.5	80	5.35	7	<0.01	0.60	5	1.12	242	0.20	<1	<5	15	<4	*	85	<10	0.16	108	<4	*		
119.1	2845	Upper Marten Lake	882	*	<5	2.43	1.5	231	1.19	<2	<0.01	0.13	3	0.22	299	0.02	<1	<5	<5	<4	*	46	<10	<0.01	32	<4	*		
119.1	2846	Upper Marten Lake	2533	*	<5	0.13	2.3	172	3.94	3	<0.01	0.34	9	1.01	486	0.03	<1	<5	5	<4	*	15	<10	0.02	133	<4	*		
119.1	2847	Upper Marten Lake	493	*	26	0.39	5.3	230	4.76	<2	0.095	0.15	4	0.13	295	0.02	<1	<5	<5	<4	*	19	47	<0.01	30	<4	*		
119.1	3748	Upper Marten Lake	3177	*	<5	0.36	1.1	197	1.86	2	<0.01	0.27	3	0.50	233	0.04	<1	<5	<5	<4	*	14	<10	0.03	75	<4	*		
120.1	3929	Bradfield Canal Shear	282	*	<5	0.03	0.9	188	4.43	2	0.015	0.08	2	0.10	115	0.02	<1	<5	<5	<20		4	<10	<0.01	6	<20			
120.1	3930	Bradfield Canal Shear	601	*	<5	0.14	10.8	191	1.40	<2	0.016	0.17	4	0.15	512	0.04	<1	<5	<5	<20		12	<10	<0.01	7	<20			
120.1	3931	Bradfield Canal Shear	848	*	<5	0.05	0.9	243	0.81	<2	<0.01	0.15	3	0.04	156	0.05	<1	<5	<5	<20		4	<10	<0.01	4	<20			
120.1	3932	Bradfield Canal Shear	246	*	<5	0.12	0.5	178	5.04	2	0.017	0.08	2	0.07	79	0.02	<1	<5	<5	<20		9	<10	<0.01	3	<20			
121.1	66	Bradfield River	1160	*	<5	0.61	<0.2	17	3.55	5	0.041	0.32	8	0.83	777	0.15	4	<5	<5	<4	*	58	<10	0.17	76	<4	*		
121.1	67	Bradfield River	1585	*	<5	0.79	<0.2	13	3.18	5	0.032	0.43	11	0.96	388	0.22	5	<5	<5	<4	*	87	<10	0.18	69	<4	*		
121.1	234	Bradfield River	1584	*	<5	0.80	<0.2	11	2.59	4	0.018	0.40	12	0.86	363	0.20	3	<5	<5	<4	*	70	<10	0.16	60	<4	*		
121.1	235	Bradfield River	1728	*	<5	0.78	<0.2	11	2.58	4	0.013	0.41	12	0.88	369	0.21	4	<5	<5	<4	*	71	<10	0.17	58	<4	*		
121.2	68	Bradfield River	1626	*	<5	0.50	<0.2	6	2.93	3	0.015	0.18	9	0.44	253	0.05	3	<5	<5	<4	*	53	<10	0.09	63	<4	*	<5	15
121.2	69	Bradfield River	1739	*	<5	0.47	<0.2	6	2.15	2	0.010	0.16	8	0.39	221	0.06	2	<5	<5	<4	*	58	<10	0.08	47	<4	*		
121.2	236	Bradfield River	1724	*	<5	0.53	<0.2	6	1.98	2	<0.01	0.18	8	0.46	244	0.05	2	<5	<5	<4	*	65	<10	0.09	43	<4	*		
121.2	237	Bradfield River	1295	*	<5	0.39	<0.2	12	10.77	5	0.011	0.09	10	0.21	345	0.03	8	<5	<5	<4	*	26	<10	0.06	219	6	*		
121.3	70	Bradfield River	883	*	<5	0.49	0.2	14	20.34	7	0.022	0.06	17	0.17	483	0.02	11	<5	<5	4	*	21	<10	0.07	307	8	*		
121.3	71	Bradfield River	1720	*	<5	0.66	<0.2	7	2.40	3	0.013	0.19	10	0.47	269	0.04	2	<5	<5	<4	*	73	<10	0.10	53	<4	*		
121.3	238	Bradfield River	279	*	<5	0.29	0.5	23	54.89	13	0.011	0.02	9	0.05	835	0.01	21	<5	<5	23	*	9	<10	0.06	635	21	*		
121.3	239	Bradfield River	1742	*	<5	0.57	<0.2	7	2.78	3	0.012	0.15	9	0.39	237	0.04	2	<5	<5	<4	*	69	<10	0.08	62	<4	*		

Table B-2. Analytical results of reconnaissance samples

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 1	147	Little Saginaw Bay	R	G	0.1	OC	Barite in tan ls	30	<0.1	68	10	19	3	3	2	0.05	<5
R 2	150	Saginaw Bay	R	S		RC	Carbonaceous fossils in gray sandy ls	<5	<0.1	23	8	71	4	55	15	1.58	<5
R 3	149	Saginaw Bay	R	G	2	OC	Limey gray ar	<5	<0.1	43	13	109	12	38	12	2.09	6
R 4	3828	Saginaw Bay area, FS Rd 6090	R	S		RC	Ls br w/ pods of py	<5	0.3	38	12	151	139	36	7	0.03	1858
R 5	3827	Saginaw Bay area, FS Rd 6409	R	S		RC	Ls br w/ py in stockwork	<5	<0.1	10	12	8	6	6	<1	0.06	26
R 6	3836	Kuiu Roads (6410)	R	G		RC	Chert br w/ fg py	<5	<0.1	6	<2	63	4	24	2	0.29	12
R 7	3835	Kuiu Roads (6420)	R	Rep	10	OC	Ls w/ red fest	<5	<0.1	5	5	5	7	2	<1	0.03	<5
R 8	3834	Kuiu Roads (6420)	SS					9	<0.1	36	13	124	2	24	14	1.57	10
R 9	3833	Kuiu Roads (6402)	R	G		RC	Qz knot w/ sulf in mudstone/gw	<5	<0.1	17	<2	17	5	13	4	1.05	<5
R 10	9703	Kuiu Is, 3305 ft peak	R	Rep	6	OC	Fest fel dike w/ dissem po	11	0.6	16	44	209	3	4	<1	0.5	13
R 11	2375	Kuiu Is, 3305 ft peak	R	Rep		RC	Fel dikes w/ dissem po	<5	<0.1	31	8	79	5	6	2	0.41	6
R 12	9573	Kuiu Is, 3305 ft peak	R	Rep	1.6	OC	Mafic dike w/ very fg po	<5	<0.1	39	8	74	3	29	31	3.11	13
R 13	9572	Kuiu Is, 3305 ft peak	R	Rep	4.7	OC	Fel intrusive w/ scattered nodules of fg po	<5	<0.1	14	12	99	4	5	2	0.4	6
R 14	2376	Kuiu Is, 3305 ft peak	R	G		OC	Fel dike w/ py, po	<5	<0.1	38	4	8	6	8	2	0.48	<5
R 15	3832	Kuiu Roads (6402)	R	G		RC	Sil gw br w/ py	<5	<0.1	31	19	64	8	19	14	5.18	6
R 16	3826	Kuiu Roads (6415)	R	G		RC	Fest cc veins	<5	<0.1	18	<2	10	7	3	<1	0.27	<5
R 17	8753	Kuiu Roads (6415)	R	S		TP	Fest gw w/ pods & veinlets of fg py	<5	<0.1	29	15	126	<1	8	24	2.65	<5
R 18	3830	Port Camden, W side	SS					10	<0.1	13	20	198	1	6	12	1.41	8
R 19	3831	Port Camden, W side	SS					<5	<0.1	14	17	237	1	6	13	1.43	8
R 20	3824	Port Camden area, FS Rd 6402	R	Rep	2.5	TP	Rhyolite dike w/ dissem & seams of py	6	<0.1	16	6	142	7	4	<1	0.62	<5
R 21	3825	Port Camden area, FS Rd 6402	R	G		RC	Rhyolite w/ dissem sulf	<5	<0.1	20	8	105	6	7	<1	0.26	<5
R 22	3865	Crowley Bight	R	G		OC	Qz-cc vein w/ po, py	<5	0.8	965	13	346	5	52	122	2.2	14
R 23	3866	Crowley Bight	R	G		OC	Msv py in ls-rich part of gw unit	60	3.5	3278	20	77	3	14	60	0.55	545
R 24	2365	Pinta Point area	R	S		OC	Sulf-rich lens in gp sc	29	0.6	661	60	1595	86	921	69	2.09	25
R 25	2362	Pinta Point area	R	G		OC	Gp sc w/ dissem py	<5	<0.1	166	19	297	8	82	30	3.25	<5
R 26	2361	Pinta Point area	R	G		OC	Gp sc w/ po, py	<5	0.3	35	22	86	2	24	11	1.47	23
R 27	2360	Pinta Point area	R	Rep		OC	Sil sc w/ fg dissem sulf	<5	0.2	6	20	63	6	9	<1	0.46	8
R 28	3713	Kake Roads, Pinta Pt area	R	S		TP	Qz w/ fg py, po	9	0.3	90	27	123	6	25	17	1.31	<5
R 29	8673	Kake Roads, Pinta Pt area	R	Rep		TP	Sil volc w/ cc, very fg dissem po, py	<5	0.1	57	18	220	6	47	14	0.87	<5
R 30	8675	Kake Roads, Pinta Pt area	R	S		RC	Skarn w/ py & trace cp	<5	1.3	918	10	66	<1	6	73	0.66	7
R 31	8674	Kake Roads, Pinta Pt area	R	S		RC	Skarn in hbl diorite	8	0.5	229	22	58	<1	4	34	0.93	57
R 32	3733	Kake Tribal Rd 4300	R	G		TP	Alt basalt w/ fg, dissem py, cp	23	0.4	1645	20	106	5	84	44	2.36	<5
R 33	8670	Kake Tribal Rd 3000	R	S		TP	Py nodules in fault br hosted in bedded ar & chert	10	1.7	48	34	65	15	64	3	0.61	123
R 34	3703	Kake Tribal Rd 3000	R	S		TP	Bedded sil ar & chert w/ lenses of py	12	1.7	84	79	142	37	142	7	0.54	191
R 35	3704	Kake Tribal Rd 3000	R	S		TP	Py nodules in sil ar & chert	7	2.5	45	63	862	46	196	8	0.32	387
R 36	8669	Kake Tribal Rd 3000	R	S		TP	Black, sil, calc ar & chert w/ 1/8" bands of py	7	1.5	57	61	164	30	119	9	0.47	234
R 37	3732	Kake Tribal Rd 2130	R	S		TP	Ar w/ knot of py	23	<0.1	85	12	103	<1	10	7	1.87	65
R 38	3701	Kake Tribal Rd 2000	R	G		TP	Sil ar w/ lenses of fg py	77	1.9	76	43	232	11	42	69	1.15	166
R 39	3702	Kake Tribal Rd 2200	R	S		OC	Thinly bedded ar w/ py lenses	43	1.4	36	13	67	29	37	2	0.38	89
R 40	3706	Kake Tribal Rd 3000	R	G		TP	Qz w/ minor cp, py	7	1	1610	16	63	2	29	6	0.57	<5
R 41	3709	Kake Roads, Turn Mtn area	R	G		FL	Qz w/ py & minor native copper	20	1.6	1942	5	63	1	21	457	0.23	17
R 42	3708	Kake Roads, Turn Mtn area	R	S		TP	Skarn mineralization in diorite w/ py	11	0.2	518	26	83	2	3	33	1.91	31
R 43	8672	Kake Tribal Rd 5000	R	S		TP	Qz float w/ py	7	0.5	386	11	107	2	18	117	0.08	43
R 44	3707	Kake Roads, Turn Mtn area	R	Rep		TP	Alt hbl diorite w/ py	6	<0.1	288	7	42	3	9	49	1.27	16
R 45	3720	Kake Roads, Turn Mtn area	R	G		TP	Gs w/ seams & dissem py, po	<5	<0.1	79	8	106	3	42	48	2.96	8
R 46	3712	Kake Roads, Turn Mtn area	R	G		TP	Ar w/ minor py	12	0.6	143	27	38	5	16	12	1.25	98

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 1	147	Little Saginaw Bay	R	13.88%	*	<5	27.4	<0.2	4	1.18	<2	1.63	0.01	<1	0.37	1036	0.02	3	<5	<5	<20		385	<10	<0.01	7	<20	
R 2	150	Saginaw Bay	R	1834	*	<5	15	0.2	97	3.44	4	0.028	0.2	11	0.86	549	0.02	2	<5	7	<20		237	<10	<0.01	69	<20	
R 3	149	Saginaw Bay	R	4313	*	<5	7.69	0.3	44	3.47	6	0.046	0.51	13	1.06	409	0.03	1	<5	7	<20		166	<10	<0.01	68	<20	
R 4	3828	Saginaw Bay area, FS Rd 6090	R	5149	*	<5	0.92	4.5	124	>10	7	0.1	0.02	<1	0.09	62	<0.01	<1	<5	<5	139	*	22	<10	<0.01	7	<20	
R 5	3827	Saginaw Bay area, FS Rd 6409	R	134	*	<5	>10	<0.2	52	3.39	<2	0.219	0.02	5	0.14	650	0.01	<1	6	<5	6	*	138	<10	<0.01	3	<20	
R 6	3836	Kuiu Roads (6410)	R	113	*	<5	0.8	<0.2	404	2.14	<2	0.081	0.19	4	0.14	91	0.01	3	<5	<5	4	*	31	<10	<0.01	35	<20	
R 7	3835	Kuiu Roads (6420)	R	<10	*	<5	>10	<0.2	10	0.36	<2	0.067	0.01	2	0.13	424	<0.01	<1	<5	<5	7	*	289	<10	<0.01	3	<20	
R 8	3834	Kuiu Roads (6420)	SS	775	*	<5	0.7	0.9	25	4.24	5	0.12	0.1	12	0.82	830	0.05	5	<5	5	<20		30	<10	0.02	63	<20	
R 9	3833	Kuiu Roads (6402)	R	374	*	<5	0.91	<0.2	651	1.9	<2	<0.01	0.19	3	0.33	293	0.06	2	<5	<5	5	*	82	<10	0.09	29	<20	
R 10	9703	Kuiu Is, 3305 ft peak	R	611		<5	0.02	1.1	121	1.33	<2	0.032	0.12	14	0.02	37	0.09	<1	<5	<5	20		8	<10	<0.01	<1	<20	
R 11	2375	Kuiu Is, 3305 ft peak	R	27		<5	0.16	0.2	140	1.93	<2	<0.01	0.12	25	0.06	209	0.11	2	<5	<5	<20		7	<10	0.06	2	<20	
R 12	9573	Kuiu Is, 3305 ft peak	R	70		<5	2.17	<0.2	89	5.44	<2	0.036	0.85	9	1.51	521	0.51	6	<5	8	<20		64	<10	0.33	89	<20	
R 13	9572	Kuiu Is, 3305 ft peak	R	156		<5	0.16	0.2	151	1.88	<2	0.273	0.12	21	0.06	223	0.11	2	<5	<5	<20		8	<10	0.06	2	<20	
R 14	2376	Kuiu Is, 3305 ft peak	R	25		<5	0.06	<0.2	148	1.6	3	<0.01	0.11	24	0.07	79	0.11	<1	<5	<5	<20		4	<10	0.01	1	<20	
R 15	3832	Kuiu Roads (6402)	R	27	*	<5	7.62	<0.2	232	3	8	0.023	0.02	6	0.29	208	0.01	5	<5	7	8	*	27	<10	0.17	84	<20	
R 16	3826	Kuiu Roads (6415)	R	<10	*	<5	>10	<0.2	8	3.04	<2	0.012	0.03	10	1.84	1134	0.01	<1	<5	<5	7	*	604	<10	<0.01	11	<20	
R 17	8753	Kuiu Roads (6415)	R	33		<5	3.93	0.4	19	8.53	12	0.023	0.03	15	2.17	1076	0.07	13	<5	16	<1	*	219	<10	0.04	145	<20	
R 18	3830	Port Camden, W side	SS	419	*	<5	0.26	1.1	9	4.03	5	0.376	0.08	12	0.29	2508	0.02	4	<5	<5	<20		19	<10	0.03	44	<20	
R 19	3831	Port Camden, W side	SS	426	*	<5	0.34	1.9	10	4.41	6	0.386	0.08	13	0.35	2494	0.03	5	<5	<5	<20		24	<10	0.04	51	<20	
R 20	3824	Port Camden area, FS Rd 6402	R	709	*	<5	0.19	0.4	176	2.43	3	0.012	0.11	21	0.06	313	0.1	<1	<5	<5	7	*	7	<10	<0.01	2	<20	
R 21	3825	Port Camden area, FS Rd 6402	R	736	*	<5	0.81	0.3	168	2.71	<2	<0.01	0.1	13	0.02	360	0.08	<1	<5	<5	6	*	13	<10	<0.01	2	<20	
R 22	3865	Crowley Bight	R	89	*	<5	2.52	2.5	54	>10	10	<0.01	0.47	2	1.65	506	0.1	<1	<5	<5	5	*	74	<10	0.08	58	<20	
R 23	3866	Crowley Bight	R	27	*	14	2.23	1.4	81	>10	6	<0.01	0.21	2	0.41	192	0.03	<1	<5	<5	3	*	94	13	0.03	18	<20	
R 24	2365	Pinta Point area	R	<1		<5	0.52	5.2	81	27.5	<2	0.015	0.06	8	2.35	391	0.02	9	<5	<5	<20		29	<10	0.2	210	<20	
R 25	2362	Pinta Point area	R	28		<5	0.16	0.6	82	8.5	5	0.024	0.09	1	3.69	1000	0.04	15	<5	18	<20		10	<10	<0.01	316	<20	
R 26	2361	Pinta Point area	R	69		<5	3.74	<0.2	43	3.51	3	0.028	0.18	6	1.1	722	0.03	4	<5	<5	<20		115	<10	<0.01	27	<20	
R 27	2360	Pinta Point area	R	20		<5	0.29	<0.2	71	2.9	<2	0.027	0.31	33	0.04	162	0.01	<1	<5	<5	<20		17	<10	<0.01	<1	<20	
R 28	3713	Kake Roads, Pinta Pt area	R	1398	*	<5	0.18	0.4	168	3.91	<2		0.07	<1	1.08	934	<0.01	5	<5	<5	<20		7	<10	0.04	53	<20	
R 29	8673	Kake Roads, Pinta Pt area	R	2250	*	<5	0.92	1.2	184	3.56	<2	0.02	0.13	<1	0.78	507	<0.01	5	<5	<5	<20		24	<10	0.03	53	<20	
R 30	8675	Kake Roads, Pinta Pt area	R	40	*	<5	1.35	0.4	46	16.4	5	0.061	0.03	<1	0.65	640	0.04	<1	<5	<5	<20		8	<10	0.01	16	<20	
R 31	8674	Kake Roads, Pinta Pt area	R	811	*	<5	3.65	0.4	64	17.1	3	0.026	<0.01	<1	0.16	1062	<0.01	1	<5	<5	<20		19	<10	0.01	30	<20	
R 32	3733	Kake Tribal Rd 4300	R	907	*	<5	2.41	0.6	103	13.8	3		0.17	<1	2.18	874	0.04	17	<5	16	<20		26	<10	0.11	182	<20	
R 33	8670	Kake Tribal Rd 3000	R	743	*	<5	0.31	0.5	166	8.62	2	0.435	0.23	<1	0.26	364	<0.01	8	5	<5	<20		7	<10	<0.01	87	<20	
R 34	3703	Kake Tribal Rd 3000	R	1010	*	<5	0.43	1.1	121	11.3	<2		0.17	<1	0.31	819	<0.01	7	15	<5	<20		10	<10	<0.01	77	<20	
R 35	3704	Kake Tribal Rd 3000	R	2472	*	<5	0.4	6.8	86	27.5	<2		0.1	<1	0.06	117	<0.01	7	70	<5	<20		17	<10	<0.01	90	<20	
R 36	8669	Kake Tribal Rd 3000	R	1823	*	<5	0.19	2.1	125	15	<2	0.875	0.15	<1	0.16	222	<0.01	6	35	<5	<20		10	<10	<0.01	68	<20	
R 37	3732	Kake Tribal Rd 2130	R	485	*	<5	0.02	0.3	18	12	4		0.34	5	0.53	892	0.02	1	<5	8	<20		5	<10	<0.01	35	<20	
R 38	3701	Kake Tribal Rd 2000	R	2733	*	<5	0.93	1.3	99	6.04	3		0.12	<1	0.68	906	0.06	2	<5	<5	<20		44	<10	<0.01	34	<20	
R 39	3702	Kake Tribal Rd 2200	R	291	*	<5	<0.01	0.6	185	10.4	<2		0.12	2	0.02	93	<0.01	7	10	<5	<20		4	<10	<0.01	77	<20	
R 40	3706	Kake Tribal Rd 3000	R	457	*	<5	2.86	0.4	146	2.27	<2		0.13	<1	1.38	1596	0.02	<1	<5	<5	<20		26	<10	<0.01	13	<20	
R 41	3709	Kake Roads, Turn Mtn area	R	814	*	<5	0.17	1.7	148	15.2	<2		0.01	<1	0.06	131	0.01	2	<5	<5	<20		10	<10	0.01	36	<20	
R 42	3708	Kake Roads, Turn Mtn area	R	435	*	<5	3.61	0.5	90	7.19	<2		<0.01	<1	0.44	1415	0.02	20	<5	9	<20		179	<10	0.14	189	<20	
R 43	8672	Kake Tribal Rd 5000	R	1060	*	<5	0.02	0.8	258	2.47	<2	0.033	<0.01	<1	0.02	58	<0.01	<1	<5	<5	<20		7	<10	<0.01	5	<20	
R 44	3707	Kake Roads, Turn Mtn area	R	25	*	<5	1.61	0.2	95	6.08	<2		0.08	<1	0.53	429	0.07	5	<5	5	<20		57	<10	0.15	51	<20	
R 45	3720	Kake Roads, Turn Mtn area	R	300	*	<5	1.76	0.5	17	6.44	<2		0.28	3	2.22	334	0.03	21	<5	16	<20		23	<10	0.47	203	<20	
R 46	3712	Kake Roads, Turn Mtn area	R	647	*	<5	7.59	0.3	31	7.26	3		0.13	<1	0.77	1589	0.02	<1	<5	<5	<20		74	<10	<0.01	23	<20	

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 47	8679	Kake Roads, Turn Mtn area	R	G		RC	Sil, bedded ar w/ py seams along fractures	9	0.3	93	18	40	<1	11	9	0.84	333
R 48	8680	Kake Roads, Turn Mtn area	R	G		OC	Sil ar w/ cg dissem py cubes	88	1.8	23	46	13	2	15	5	0.24	541
R 49	3722	Kake Roads, Turn Mtn area	R	Rep	8	OC	Sil ar w/ fg py laminae & cg py lenses	39	1.6	63	60	20	57	49	24	0.37	137
R 50	3721	Kake Roads, Turn Mtn area	R	G		FL	Sil ar w/ dissem cp, py	24	1.9	1599	15	8	3	35	20	0.25	98
R 51	3719	Kake Roads, Turn Mtn area	R	G		TP	Black ar w/ seams of py	13	0.5	281	27	89	7	13	8	1.79	11
R 52	8678	Kake Tribal Rd 1000	R	S		TP	Contorted graphitic ar w/ irregular knots of py	13	0.6	77	15	161	6	38	4	0.5	33
R 53	3718	Kake Tribal Rd 7000	R	S		TP	Patches & seams of py in ar & ls	18	0.6	88	21	26	100	10	7	0.9	21
R 54	3731	Gunnuk Creek tributary	SS					<5	<0.1	37	12	462	<1	82	21	2.07	6
R 55	3875	Jenny Creek	R	G		FL	Sil ar br w/ dissem py	<5	<0.1	39	11	64	5	18	3	0.35	41
R 56	8666	Kake, FS Rd 6304	R	Rep	0.9	TP	Sil, bedded ar w/ py on fault surfaces	163	0.6	34	119	51	42	7	2	0.48	25
R 57	3696	Kake, FS Rd 6304	R	G		TP	Carbonaceous ar w/ py lenses	34	1.1	56	115	405	67	15	4	1.03	58
R 58	3697	Kake, spur of FS Rd 6304	R	G		TP	Barite w/ minor cp in ar	8	0.8	198	<2	1337	<1	10	3	0.44	<5
R 59	3698	Kake, spur of FS Rd 6304	R	S		TP	Ar to slate w/ lenses of py	38	2.8	63	38	41	27	49	8	0.76	141
R 60	8667	Kake, spur of FS Rd 6304	R	C	4.4	TP	Sil, bedded ar & chert w/ py in cubes & blebs	<5	0.9	33	14	38	13	21	4	0.87	22
R 61	3699	Kake, spur of FS Rd 6304	R	G		RC	Jasperoid w/ minor cp	12	<0.1	35	<2	14	2	12	4	0.42	<5
R 62	8668	Kake, FS Rd 6304	R	Rep		TP	Alt zone w/ cc & limonite near fault br in ar	<5	<0.1	38	10	67	2	33	10	0.56	6
R 63	6416	Cathedral Falls Creek	R	S		FL	Sil volc w/ patches & seams of py, po, minor cp	<5	<0.1	33	5	92	4	5	5	1.80	<5
R 64	3735	Kake, FS Rd 6366	R	G		FL	Dol w/ seams of py	<5	<0.1	20	8	145	25	8	2	0.16	85
R 65	3734	Kake, FS Rd 6030	R	G		TP	Qz-cc vn w/ sulf	<5	<0.1	14	7	14	4	3	3	0.14	<5
R 66	3877	Kake, FS Rd 6030	R	G		FL	Hornblendite w/ po	<5	<0.1	115	4	24	2	66	50	0.75	<5
R 67	3884	Kake, FS Rd 6326	R	S		TP	Basalt w/ minor py	<5	<0.1	24	9	346	6	6	40	3.63	12
R 68	3899	Kake, FS Rd 6314	R	G		FL	Chert w/ py	<5	<0.1	5	<2	30	<1	9	1	0.01	<5
R 69	6414	Kake, FS Rd 6314	R	Rep		TP	Aqua-blue chert in volc rock	<5	<0.1	22	<2	40	1	6	8	1.1	<5
R 70	3922	Portage Bay, W of mouth	SS					<5	<0.1	29	7	131	3	28	15	1.17	16
R 71	3923	Portage Bay, W of mouth	SS					43	0.2	78	6	122	3	30	22	1.91	6
R 72	3924	Portage Bay, W of mouth	R	S		TP	Cp & po in gs	<5	<0.1	493	<2	31	3	24	15	0.50	<5
R 73	3925	Portage Bay, W of mouth	R	G		FL	Sil gneiss w/ banded po, cp	216	22.4	16171	161	1558	11	38	192	0.10	199
R 74	8803	Portage Bay, W of mouth	R	S		OC	Chl sc	29	0.3	150	7	32	2	27	18	1.03	<5
R 75	8802	Portage Bay, W of mouth	SS					<5	0.3	92.0	6	110	4	28	17	2	6
R 76	3927	Portage Bay, W of mouth	R	G		FL	Gs sc w/ py, minor cp	<5	0.3	226	6	86	3	10	29	1.48	<5
R 77	3926	Portage Bay, W of mouth	SS					6	0.3	63	10	130	3	24	17	2.06	8
R 78	3876	Kake, FS Rd 6030	R	G		RC	Qz w/ py & po in slate & sc	<5	0.2	39	16	61	9	22	4	0.1	<5
R 79	3683	Portage Bay, FS Rd 45603	R	G		TP	Qz w/ minor py	8	0.4	61	29	210	5	37	11	0.31	<5
R 80	3676	Portage Bay area	R	G		TP	Sil fg intrusive w/ sulf	15	1.6	252	11	108	3	132	35	0.7	6
R 81	6375	Portage Bay area	R	S		RC	Intrusive w/ seams of mo	10	0.6	165	104	44	###	73	29	1.18	<5
R 82	6374	Portage Bay area	R	G		RC	Gray sil hornfels w/ fg sulf	7	0.7	90	10	163	8	104	17	0.46	6
R 83	6373	Portage Bay area	R	G		RC	Sil intrusive w/ py, po, cp	11	0.3	263	40	81	8	184	29	0.88	36
R 84	6372	Portage Bay area	R	Rep		OC	Sil intrusive w/ 2-3% sulf	17	0.6	294	22	136	37	219	30	0.86	22
R 85	6365	Portage Bay area	SS					<5	<0.2	121	3	56	<1	23	28	1.62	<5
R 86	6366	Portage Bay area	R	G		TP	Black ar w/ dissem py	<5	<0.1	61	5	93	2	25	20	2.26	<5
R 87	6370	Portage Bay area	SS					24	<0.2	21	36	159	1	11	16	1.18	35
R 88	6367	Portage Bay area	SS					29	<0.2	21	18	66	2	18	17	1.30	24
R 89	6391	Towers Arm area	R	S		OC	Qz & sulf layer in slate	<5	0.5	73	9	101	15	19	9	1.53	17
R 90	6390	Towers Arm area	R	Rep	0.6	OC	Very fg felsic volc w/ py, po	<5	<0.1	16	5	122	2	14	26	4.01	<5
R 91	6388	Towers Arm area	R	Rep		OC	Felsic volc w/ minor dissem po, py	<5	<0.1	12	10	63	3	15	8	0.43	<5
R 92	6393	Towers Arm area	SS					<5	<0.2	37	9	89	2	22	19	1.77	22

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 47	8679	Kake Roads, Turn Mtn area	R	583	*	<5	1.73	0.3	83	3.29	<2	0.011	0.37	<1	0.53	859	0.03	1	<5	<5	<20		32	<10	<0.01	19	<20	
R 48	8680	Kake Roads, Turn Mtn area	R	794	*	<5	<0.01	0.3	232	3.53	<2	0.028	0.15	7	0.01	76	<0.01	<1	<5	<5	<20		6	<10	<0.01	6	<20	
R 49	3722	Kake Roads, Turn Mtn area	R	1218	*	<5	<0.01	0.2	127	9.81	<2		0.1	5	0.16	353	<0.01	<1	7	<5	<20		4	<10	<0.01	15	<20	
R 50	3721	Kake Roads, Turn Mtn area	R	641	*	<5	0.08	<0.2	134	1.66	<2		0.14	17	0.02	45	<0.01	<1	7	<5	<20		2	<10	<0.01	8	<20	
R 51	3719	Kake Roads, Turn Mtn area	R	330	*	<5	0.09	0.3	30	7.89	5		0.36	5	0.81	544	0.03	3	<5	<5	<20		5	<10	<0.01	41	<20	
R 52	8678	Kake Tribal Rd 1000	R	662	*	<5	2.87	1.8	178	5.41	<2	0.1	0.2	5	0.99	1445	<0.01	5	<5	<5	<20		93	<10	<0.01	49	<20	
R 53	3718	Kake Tribal Rd 7000	R	982	*	<5	2.85	0.2	88	11.5	3		0.29	2	0.32	773	0.03	<1	<5	<5	<20		37	<10	<0.01	25	<20	
R 54	3731	Gunnuk Creek tributary	SS	1020	*	<5	0.62	4	38	3.63	4		0.13	10	0.79	5053	0.02	<1	<5	<5	<20		32	<10	0.04	52	<20	
R 55	3875	Jenny Creek	R	2269	*	<5	0.02	0.3	122	>10	3	14.38	0.11	1	0.03	39	<0.01	<1	<5	<5	5	*	12	<10	<0.01	10	<20	
R 56	8666	Kake, FS Rd 6304	R	530	*	<5	0.05	0.8	74	2.99	2	0.576	0.22	9	0.18	57	<0.01	2	<5	<5	<20		9	<10	<0.01	24	<20	
R 57	3696	Kake, FS Rd 6304	R	4013	*	<5	0.1	5	139	7.4	4		0.26	9	0.6	134	<0.01	3	<5	<5	<20		17	<10	<0.01	43	<20	
R 58	3697	Kake, spur of FS Rd 6304	R	49.67%	*	<5	2.39	24.6	19	0.85	<2		0.02	<1	0.45	609	<0.01	2	<5	<5	<20		292	<10	<0.01	21	<20	
R 59	3698	Kake, spur of FS Rd 6304	R	3049	*	<5	0.12	0.4	154	7.24	2		0.15	4	0.18	229	<0.01	6	10	<5	<20		7	<10	<0.01	68	<20	
R 60	8667	Kake, spur of FS Rd 6304	R	623	*	<5	2.4	0.4	147	1.99	3	0.1	0.35	10	0.27	724	0.02	6	<5	<5	<20		54	<10	<0.01	59	<20	
R 61	3699	Kake, spur of FS Rd 6304	R	7661	*	<5	2.37	<0.2	231	2.69	<2		0.03	<1	0.94	4852	<0.01	<1	<5	<5	<20		50	<10	<0.01	11	<20	
R 62	8668	Kake, FS Rd 6304	R	1803	*	<5	14.6	0.3	47	6.6	<2	0.066	0.13	<1	5.13	1147	0.01	5	<5	9	<20		437	<10	<0.01	67	<20	
R 63	6416	Cathedral Falls Creek	R	2326	*	<5	0.08	<0.2	41	4.59	16	0.09	0.12	37	0.91	195	0.06	<1	<5	<5	4	*	4	<10	<0.01	11	10	*
R 64	3735	Kake, FS Rd 6366	R	203	*	<5	3.57	1.5	39	20.1	<2		0.04	<1	3.35	581	<0.01	<1	<5	<5	<20		32	<10	<0.01	4	<20	
R 65	3734	Kake, FS Rd 6030	R	413	*	<5	19.7	0.6	66	2.24	<2		0.02	<1	2.23	3701	<0.01	<1	<5	<5	<20		250	<10	<0.01	15	<20	
R 66	3877	Kake, FS Rd 6030	R	886	*	<5	1.46	<0.2	279	6.02	<2	0.014	0.18	1	1.29	202	0.1	24	<5	13	2	*	39	<10	0.15	296	<20	
R 67	3884	Kake, FS Rd 6326	R	647	*	<5	1.37	1.0	10	>10	4	0.13	0.01	13	3.55	1086	0.03	9	<5	9	6	*	53	<10	0.42	144	<20	
R 68	3899	Kake, FS Rd 6314	R	95	*	<5	0.82	<0.2	263	3.57	<2	0.074	<0.01	1	0.02	120	<0.01	<1	<5	<5	<1	*	10	<10	<0.01	9	<20	
R 69	6414	Kake, FS Rd 6314	R	1073	*	<5	1.29	<0.2	96	2.53	<2	<0.01	0.42	2	0.81	304	<0.01	5	<5	9	6	*	17	<10	0.07	80	9	*
R 70	3922	Portage Bay, W of mouth	SS	1165	*	<5	0.47	0.6	143	3.18	<2	0.08	0.12	4	0.71	2204	0.03	4	<5	<5	3	*	22	<10	0.11	48	<20	
R 71	3923	Portage Bay, W of mouth	SS	951	*	<5	0.74	0.3	107	4.67	<2	0.05	0.11	4	1.24	1144	0.02	7	<5	<5	3	*	24	<10	0.27	83	<20	
R 72	3924	Portage Bay, W of mouth	R	76	*	<5	7.31	0.3	65	1.81	<2	0.03	<0.01	2	0.74	424	0.04	2	<5	<5	<20		45	<10	0.22	37	<20	
R 73	3925	Portage Bay, W of mouth	R	69	*	7	0.03	18.9	116	>10	5	0.40	0.03	<1	0.06	41	<0.01	<1	<5	<5	<20		3	<10	<0.01	3	<20	
R 74	8803	Portage Bay, W of mouth	R	328	*	<5	3.20	0.2	85	2.95	<2	0.04	0.04	2	0.85	394	0.07	3	<5	<5	<20		19	<10	0.24	51	<20	
R 75	8802	Portage Bay, W of mouth	SS	1118	*	<5	0.62	0	110	4.25	<2	0.05	0.1	5	1.09	1001	0.02	5	<5	<5	<20		24	<10	0	68	<20	
R 76	3927	Portage Bay, W of mouth	R	20	*	<5	0.60	0.3	69	3.71	<2	<0.01	<0.01	4	0.95	485	0.06	<1	<5	<5	<20		18	<10	0.16	24	<20	
R 77	3926	Portage Bay, W of mouth	SS	1316	*	<5	0.58	0.4	93	4.61	<2	0.07	0.17	6	1.03	1257	0.03	4	<5	<5	3	*	37	<10	0.18	46	<20	
R 78	3876	Kake, FS Rd 6030	R	812	*	<5	3.82	0.7	141	0.94	<2	0.037	0.03	2	0.09	1016	<0.01	<1	<5	<5	9	*	60	<10	<0.01	8	<20	
R 79	3683	Portage Bay, FS Rd 45603	R	2926	*	<5	3.13	0.7	195	1.93	<2	0.32	0.14	2	0.27	1008	0.02	<1	<5	<5	<4	*	203	<10	<0.01	10	<4	*
R 80	3676	Portage Bay area	R	2580	*	<5	0.92	0.4	57	5.1	<2	<0.01	0.25	9	0.15	167	0.02	1	<5	<5	<4	*	83	<10	0.16	31	<4	*
R 81	6375	Portage Bay area	R	117	*	<5	6.67	0.5	79	5.34	<2	<0.01	0.09	4	1.09	1954	0.12	6	<5	13	<4	*	394	<10	0.14	94	9	*
R 82	6374	Portage Bay area	R	<10	*	<5	1.29	1.1	208	2.50	<2	<0.01	0.17	25	0.17	495	0.02	4	<5	<5	<4	*	38	<10	0.06	44	7	*
R 83	6373	Portage Bay area	R	647	*	<5	1.25	0.9	132	3.05	<2	<0.01	0.08	5	0.39	411	0.03	3	<5	<5	<4	*	130	<10	0.13	40	7	*
R 84	6372	Portage Bay area	R	2024	*	<5	1.87	1.4	261	3.96	<2	0.02	0.15	23	0.55	539	0.02	16	<5	<5	5	*	62	<10	0.08	185	10	*
R 85	6365	Portage Bay area	SS	377	*	<5	1.15	<0.2	33	3.70	<2	0.03	0.36	3	1.38	421	0.10	10	<5	<5	<20		93	<10	0.15	108	<20	
R 86	6366	Portage Bay area	R	763	*	<5	0.92	<0.2	134	3.84	<2	0.02	1.08	3	1.42	298	0.08	4	<5	<5	<20		37	<10	0.12	72	<20	
R 87	6370	Portage Bay area	SS	373	*	<5	0.57	1.4	23	4.31	<2	0.06	0.09	3	0.81	539	0.03	13	<5	<5	<20		53	<10	0.22	125	<20	
R 88	6367	Portage Bay area	SS	534	*	<5	0.47	0.3	35	5.05	<2	0.03	0.16	4	0.87	972	0.03	11	<5	<5	<20		41	<10	0.16	113	<20	
R 89	6391	Towers Arm area	R	770	*	<5	1.32	1.4	88	6.89	<2	0.093	0.23	3	1.24	549	0.03	2	<5	<5	<4	*	31	<10	<0.01	37	11	*
R 90	6390	Towers Arm area	R	383	*	<5	4.9	0.4	51	8.04	<2	0.038	0.15	14	2.97	1372	0.07	6	<5	15	5	*	132	<10	<0.01	114	11	*
R 91	6388	Towers Arm area	R	295	*	<5	1.93	0.3	119	2.2	<2	0.028	0.11	20	0.68	425	0.08	2	<5	<5	8	*	78	<10	<0.01	21	11	*
R 92	6393	Towers Arm area	SS	853	*	<5	0.55	0.5	30	5.25	<2	0.061	0.07	6	0.84	2088	0.02	6	<5	<5	<20		23	<10	0.11	75	<20	

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 93	2358	Salt Chuck area	R	Rep	0.5	RC	Qz vn	<5	<0.1	6	<2	<1	<1	10	<1	0.04	<5
R 94	231	Salt Chuck area	R	S		RC	Qz vn-sc contact w/ py	<5	<0.1	140	9	20	<1	11	8	0.22	<5
R 95	230	Salt Chuck area	R	C	6.5	OC	Qz vn	<5	<0.1	4	35	25	1	9	<1	0.01	<5
R 96	6395	Portage Mountain Group area	SS					13	<0.2	115	3	74	3	33	47	1.34	<5
R 97	3907	Towers Arm, W side	R	S		OC	Cp & po in qz-cc veinlets in gs	10	<0.1	259	4	75	3	58	35	3.30	<5
R 98	59	Towers Arm. E side	R	S		OC	Fest black ls & marble w/ py	<5	0.1	33	48	177	2	47	14	2.33	68
R 99	229	North Arm	R	Rep	2.5	OC	Qz vn	<5	<0.1	4	22	118	3	14	1	0.81	<5
R 100	57	North Arm	R	Rep	0.4	OC	Fest qz-ser sc w/ py	<5	1.3	21	42	110	2	59	13	6.05	33
R 101	56	North Arm	R	G	0.4	OC	Qz-ser sc w/ py	<5	0.3	27	69	112	3	44	12	6.98	10
R 102	6354	Taylor Creek area	R	Rep	100	OC	Calc gs w/ dissem & banded py, cp	12	<0.1	187	5	139	3	42	31	1.03	12
R 103	58	Towers Arm, E side	R	Rep	0.5	OC	Irregular qz stringers & lenses in ls	<5	<0.1	4	84	57	3	15	<1	0.03	<5
R 104	228	North Arm	R	G	0.2	OC	Qz vn w/ sulf	<5	0.5	76	215	235	<1	29	10	1.58	<5
R 105	55	North Arm	R	Rep	0.5	OC	Fest gs	<5	1.2	398	420	342	2	64	33	2.83	<5
R 106	6413	MacDonald Arm	R	G		OC	Black slate w/ lenses of msv py	48	0.6	42	25	3	10	21	2	0.16	30
R 107	6315	Duncan Creek area	R	G		RC	Hornfels w/ py	<5	0.4	74	13	118	3	50	23	2.71	<5
R 108	6327	Drainage E of Mitchell Slough	R	RC		OC	Alt slate w/ 1-2% py	<5	0.3	77	11	135	5	33	22	2.29	<5
R 109	6329	Drainage E of Mitchell Slough	R	G		FL	Qz in ar w/minor py & unknown acicular mineral	<5	<0.1	20	13	27	3	14	4	0.7	<5
R 110	6382	Drainage E of Mitchell Slough	R	G		OC	Intemediate volc w/ dissem po	17	<0.1	71	3	79	2	6	14	2.06	<5
R 111	939	Lindenburg Pen. FS Roads (6354)	R	S		OC	Qz & alt phy w/ fault gouge	34	0.2	164	30	194	4	127	64	5.33	108
R 112	8897	Lindenburg Pen. FS Roads (6354)	R	G	0.4	OC	Shear w/ fault gouge & fest qz vn	<5	<0.1	19	12	79	2	25	17	2.18	14
R 113	8896	Lindenburg Pen. FS Roads (6354)	R	CC		OC	Shear w/ fault gouge & large qz crystals	<5	<0.1	13	<2	26	3	15	7	0.73	<5
R 114	8895	Lindenburg Pen. FS Roads (6354)	R	CC	5	OC	Shear w/ chl alteration & qz vugs	<5	<0.1	44	12	140	<1	43	29	4.66	16
R 115	459	Lindenberg Pen, FS Rd 6352	R	G	0.3	TP	Qz vn w/ trace gn	<5	0.4	39	97	31	<1	7	2	0.49	<5
R 116	740	Spruce Creek area	R	G		RC	Fest sil ar w/ dissem py/po, also in bands/lenses	9	<0.1	307	17	120	3	32	60	1.13	15
R 117	458	Lindenberg Pen, FS Rd 6352	R	G	0.3	TP	Sc w/ qz stringers & sulf	<5	0.2	497	4	34	2	66	13	2.12	32
R 118	8711	Lindenberg Pen, FS Rd 6352	R	S		RC	Sheared sc w/ cubic py	<5	<0.1	98	5	33	2	24	10	1.35	<5
R 119	457	Lindenberg Pen, FS Rd 6352	R	Rep	1	TP	Gray, fest, sil sc w/ py	29	0.5	102	24	191	3	34	29	2.89	6
R 120	6348	Spruce Creek area	R	S		OC	Qz segregations w/ cp in chl sc	36	0.6	178	35	862	1	19	27	2.4	<5
R 121	9684	Lindenberg Pen, FS Rd 6352	R	G		OC	Fest, gray sc w/ py on cleavage surfaces	<5	<0.1	102	10	48	2	25	27	1.09	<5
R 122	9685	Lindenberg Pen, FS Rd 6352	R	G		TP	Blocky ar w/ py on cleavage surfaces	<5	0.2	49	12	135	3	21	18	2.38	<5
R 123	6285	Spruce Creek area	R	G		OC	Alt gs w/ minor py, cp	<5	<0.1	255	7	128	1	68	53	1.6	<5
R 124	352	Spruce Creek area	R	G		FL	Fest gs w/ py	12	<0.1	104	13	107	<1	53	31	3.05	<5
R 125	353	Spruce Creek area	SS					16	0.3	104	23	283	11	69	21	1.52	31
R 126	6345	Colorado Creek	R	G		FL	Qz in black slate w/ minor py	<5	<0.1	29	10	102	3	14	4	0.4	<5
R 127	3820	Lindenberg Pen, FS Rd 6352	R	Rep		FL	Qz w/ fg py	<5	<0.1	15	<2	<1	2	12	1	0.07	9
R 128	3819	Lindenberg Pen, FS Rd 6352	R	S		FL	Qz w/ seams of py	6	<0.1	19	3	8	3	17	3	0.09	90
R 129	3816	Lindenberg Pen, FS Rd 6352	R	G		FL	Fest qz w/ minor py	<5	<0.1	41	<2	23	2	18	2	0.05	<5
R 130	532	Duncan Canal, W side	SS					<5	0.2	41	22	106	<1	25	15	1.63	11
R 131	531	Duncan Canal, W side	SS					<5	0.4	40	19	97	2	20	17	1.14	11
R 132	530	Duncan Canal, W side	R	Rep	0.8	OC	Fest qz-cc zone	<5	<0.1	16	8	15	6	8	3	0.24	<5
R 133	529	Duncan Canal, W side	SS					37	0.3	24	21	73	<1	14	16	1.25	11
R 134	528	Duncan Canal, W side	SS					<5	<0.1	14	22	7	3	12	<1	0.06	<5
R 135	8800	Duncan Canal, W side	R	S		OC	Shale/sc	16	<0.1	41.0	13	36	3	73	22	2	9
R 136	3919	Duncan Canal, W side	R	G		FL	Qz-ser sc w/ py, sl	<5	0.3	133	19	7208	12	13	7	0.28	10
R 137	527	Duncan Canal, W side	SS						0.3	37	36	167	<1	23	28	1.23	11
R 138	3918	Duncan Canal, W side	R	G		FL	Calc sc w/ ~5% py	<5	0.6	90	37	43	3	25	28	0.61	15

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 93	2358	Salt Chuck area	R	2		<5	0.01	<0.2	353	0.39	<2	<0.01	<0.01	<1	0.02	37	<0.01	<1	<5	<5	<20		1	<10	<0.01	2	<20	
R 94	231	Salt Chuck area	R	70	*	<5	3.48	<0.2	138	1.39	<2	0.015	0.02	<1	0.25	441	0.01	<1	<5	<5	<20		77	<10	<0.01	17	<20	
R 95	230	Salt Chuck area	R	24	*	<5	0.02	<0.2	157	0.2	<2	0.159	<0.01	<1	0.02	25	<0.01	<1	<5	<5	<20		<1	<10	<0.01	1	<20	
R 96	6395	Portage Mountain Group area	SS	208	*	<5	0.87	0.4	52	7.87	<2	0.05	0.13	2	0.9	1090	0.04	16	<5	6	<20		34	<10	0.16	231	<20	
R 97	3907	Towers Arm, W side	R	301	*	<5	1.56	0.4	181	7.47	<2	0.02	0.02	2	2.28	857	0.03	9	<5	9	<20		137	<10	0.35	141	<20	
R 98	59	Towers Arm. E side	R	468	*	<5	>10	0.4	42	>10	<2	0.052	0.04	13	2.05	3025	0.01	1	<5	8	<20		116	<10	<0.01	109	<20	
R 99	229	North Arm	R	19527	*	<5	7.47	0.2	83	1.05	<2	0.108	<0.01	2	4.12	226	<0.01	5	<5	<5	<20		149	<10	<0.01	6	<20	
R 100	57	North Arm	R	>20000	*	<5	2.61	0.3	39	9.47	4	0.091	0.09	<1	1.19	688	0.01	3	<5	<5	<20		2	<10	<0.01	12	<20	
R 101	56	North Arm	R	>20000	*	<5	1.3	0.5	80	8.6	7	0.103	0.05	<1	0.47	246	0.02	5	<5	<5	<20		2	<10	0.02	34	<20	
R 102	6354	Taylor Creek area	R	3037	*	<5	7.77	0.7	48	8.32	<2	0.466	0.36	5	0.58	1324	0.04	6	14	11	<20		205	<10	<0.01	93	<20	
R 103	58	Towers Arm, E side	R	583	*	<5	0.65	<0.2	303	0.34	<2	0.104	<0.01	<1	0.05	41	0.01	<1	<5	<5	<20		17	<10	<0.01	<1	<20	
R 104	228	North Arm	R	444	*	<5	1.31	<0.2	136	3.48	<2	0.896	0.02	2	1.34	542	0.07	3	<5	<5			19	<10	0.32	82	<20	
R 105	55	North Arm	R	252	*	<5	1.12	0.9	130	7.37	<2	0.413	0.03	4	1.96	857	0.05	3	<5	5			23	<10	0.6	179	<20	
R 106	6413	MacDonald Arm	R	297	*	<5	0.03	<0.2	228	2.38	<2	0.15	0.11	2	0.02	31	0.02	<1	<5	<5	<4	*	3	<10	<0.01	12	9	*
R 107	6315	Duncan Creek area	R	796	*	<5	0.44	0.2	175	4.44	<2	0.022	0.94	8	1.4	1364	0.08	8	<5	7	<20		38	<10	0.11	124	<20	
R 108	6327	Drainage E of Mitchell Slough	R	843	*	<5	0.64	0.4	32	5.78	<2	0.035	0.2	5	1.42	710	0.02	1	<5	<5	<20		25	<10	0.18	30	<20	
R 109	6329	Drainage E of Mitchell Slough	R	336	*	<5	4.86	0.3	194	1.58	<2	0.058	0.16	3	0.32	584	0.02	<1	<5	<5	<20		272	<10	0.06	12	<20	
R 110	6382	Drainage E of Mitchell Slough	R	701	*	<5	0.83	0.3	46	3.01	<2	0.017	1.06	4	1.19	725	0.09	3	<5	<5	<4	*	94	<10	0.13	58	9	*
R 111	939	Lindenburg Pen. FS Roads (6354)	R	334	*	<5	0.46	1.1	149	>10	<2	0.088	0.06	6	3.36	3523	<0.01	6	<5	9	<4	*	18	<10	0.08	118	9	*
R 112	8897	Lindenburg Pen. FS Roads (6354)	R	191	*	<5	0.3	0.3	197	5	<2	0.017	0.07	2	1.58	1242	0.04	4	<5	<5	5	*	20	<10	0.05	79	10	*
R 113	8896	Lindenburg Pen. FS Roads (6354)	R	85	*	<5	0.19	0.2	268	1.35	<2	<0.01	0.03	1	0.47	345	0.04	2	<5	<5	<4	*	14	<10	0.08	33	9	*
R 114	8895	Lindenburg Pen. FS Roads (6354)	R	164	*	<5	0.82	0.3	166	7.53	<2	0.03	0.07	5	3.34	2009	0.05	7	<5	11	<4	*	73	<10	0.15	162	10	*
R 115	459	Lindenberg Pen, FS Rd 6352	R	574	*	<5	6.46	<0.2	144	1.22	<2	<0.01	0.07	<1	0.45	1617	<0.01	<1	<5	<5	<20		566	<10	<0.01	12	<20	
R 116	740	Spruce Creek area	R	2707	*	<5	3.22	0.9	47	>10	<2	0.04	0.17	9	0.79	459	0.04	<1	<5	<5	<4	*	141	<10	0.14	41	11	*
R 117	458	Lindenberg Pen, FS Rd 6352	R	655	*	<5	1.44	<0.2	81	6.92	4	0.014	0.28	5	1.65	692	0.06	<1	<5	<5	<20		78	<10	0.2	74	<20	
R 118	8711	Lindenberg Pen, FS Rd 6352	R	289	*	<5	1.13	<0.2	94	2.64	2	<0.01	0.16	6	1	343	0.05	<1	<5	<5	<20		102	<10	0.22	51	<20	
R 119	457	Lindenberg Pen, FS Rd 6352	R	554	*	<5	3	0.2	90	8.46	4	<0.01	0.22	2	3.15	1957	0.03	<1	<5	5	<20		52	14	0.2	90	<20	
R 120	6348	Spruce Creek area	R	906	*	<5	1.05	10.1	132	5.73	<2	0.194	0.38	6	1.46	1185	0.04	3	<5	<5	<20		98	<10	0.14	50	<20	
R 121	9684	Lindenberg Pen, FS Rd 6352	R	914	*	<5	0.86	<0.2	71	2.79	<2	0.012	0.33	2	0.65	295	0.03	<1	<5	<5	<20		47	<10	0.23	44	<20	
R 122	9685	Lindenberg Pen, FS Rd 6352	R	761	*	<5	0.6	<0.2	59	5.25	<2	0.088	0.17	4	1.17	1026	0.04	1	<5	<5	<20		42	<10	0.21	43	<20	
R 123	6285	Spruce Creek area	R	207	*	<5	3.15	0.4	86	>10	<2	2.073	0.02	6	2.03	1920	<0.01	17	<5	31	<20		78	<10	<0.01	247	<20	
R 124	352	Spruce Creek area	R	405	*	<5	2.85	<0.2	99	5.41	<2	0.018	0.04	2	2.08	1079	0.06	2	<5	10	<20		21	<10	0.44	133	<20	
R 125	353	Spruce Creek area	SS	836	*	<5	0.52	1.6	79	5.44	4	0.542	0.05	7	1.12	1210	0.01	7	<5	<5	<20		15	<10	0.11	94	<20	
R 126	6345	Colorado Creek	R	187	*	<5	5.81	1.3	227	1.39	<2	0.039	0.09	2	0.46	698	0.01	<1	<5	<5	<20		300	<10	0.03	9	<20	
R 127	3820	Lindenberg Pen, FS Rd 6352	R	421	*	<5	<0.01	<0.2	304	0.65	<2	0.023	0.02	2	<0.01	35	<0.01	<1	<5	<5	<20		2	<10	<0.01	4	<20	
R 128	3819	Lindenberg Pen, FS Rd 6352	R	662	*	<5	0.06	<0.2	183	7.79	<2	0.27	0.02	3	0.01	54	<0.01	<1	<5	<5	<20		3	<10	<0.01	6	<20	
R 129	3816	Lindenberg Pen, FS Rd 6352	R	55	*	<5	0.41	0.2	219	0.7	<2	0.095	<0.01	2	0.19	165	<0.01	<1	<5	<5	<20		3	<10	<0.01	4	<20	
R 130	532	Duncan Canal, W side	SS	1670	*	<5	0.34	<0.2	26	4.01	<2	0.127	0.08	16	1.12	793	0.04	3	<5	<5	<20		21	<10	0.07	48	<20	
R 131	531	Duncan Canal, W side	SS	1119	*	<5	0.36	0.3	20	3.42	<2	0.169	0.13	8	0.62	1234	0.02	3	<5	<5	<20		23	<10	0.08	54	<20	
R 132	530	Duncan Canal, W side	R	275	*	<5	>10	<0.2	40	1.21	<2	0.193	0.01	6	1.55	2302	0.01	<1	<5	12	6	*	977	<10	<0.01	11	<20	
R 133	529	Duncan Canal, W side	SS	1315	*	<5	0.32	0.3	16	2.88	<2	0.19	0.13	8	0.55	1545	0.02	3	<5	<5	<20		20	<10	0.06	49	<20	
R 134	528	Duncan Canal, W side	SS	107	*	<5	2.43	<0.2	344	0.6	<2	0.245	0.01	2	0.25	1377	0.02	<1	<5	<5	3	*	83	<10	<0.01	3	<20	
R 135	8800	Duncan Canal, W side	R	936	*	<5	2.08	0	119	6.27	7	0.02	0.1	5	3.96	810	0.04	6	<5	8.00	<20		46	<10	<0.01	99	<20	
R 136	3919	Duncan Canal, W side	R	690	*	<5	0.25	26	227	2.02	<2	0.391	0.18	2	0.03	98	0.02	<1	<5	<5	<20		10	<10	<0.01	4	<20	
R 137	527	Duncan Canal, W side	SS	1308	*	<5	0.48	0.8	29	3.64	<2	0.246	0.1	7	0.74	1853	0.04	4	<5	<5	<20		26	<10	0.11	58	<20	
R 138	3918	Duncan Canal, W side	R	3177	*	<5	9.63	0.3	47	6.2	5	0.178	0.12	8	1.31	2780	0.03	4	<5	9	<20		349	<10	<0.01	74	<20	

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 139	3917	Duncan Canal, W side	R	G		FL	Felsic intrusive w/ minor sulf	41	0.6	37	91	27	2	2	<1	<0.01	10
R 140	526	Duncan Canal, W side	SS					<5	0.3	43	19	114	<1	30	19	1.23	10
R 141	517	Duncan Canal, W side	SS					<5	0.2	33	15	108	<1	31	19	1.22	9
R 142	516	Duncan Canal, W side	SS					<5	0.3	15	25	62	<1	8	8	1.18	33
R 143	515	Duncan Canal, W side	SS					<5	<0.1	7	13	31	<1	5	4	0.91	<5
R 144	514	Duncan Canal, W side	SS					<5	0.6	35	42	140	<1	20	19	1.32	16
R 145	8752	NW Duncan Canal	SS					<5	0.2	14	16	56	<1	10	8	1.1	6
R 146	8751	NW Duncan Canal	SS					<5	<0.1	8	11	32	<1	6	4	0.87	<5
R 147	8651	Kupreanof Pyrite area	R	G		FL	Qz	<5	<0.1	13	14	16	6	11	<1	0.06	7
R 148	49	Castle River area	R	Rep	0.5	OC	Qz band in fest gs	8	0.2	44	41	129	1	9	8	0.76	15
R 149	935	Bains Cove area	R	G		RC	White bull qz w/ fest on fractures	29	<0.1	10	<2	15	1	8	2	0.36	<5
R 150	8889	Bains Cove area	R	G	0.4	RC	Qz-cc bands in phy	<5	<0.1	18	5	30	2	9	4	0.49	<5
R 151	8887	Bains Cove area	R	RC	3	OC	Dirty gray ls	<5	<0.1	6	7	9	<1	1	<1	0.03	<5
R 152	542	Little Duncan Bay	SS					<5	0.2	24	16	104	<1	15	10	1.04	8
R 153	8814	Little Duncan Bay, SW	R	S		OC	Qz w/ cp	29	50	**8.1**	6	228	4	108	57	0.02	7
R 154	3953	Little Duncan Bay, SW	R	S		OC	Qz-mica sc w/ py	18	0.4	99	16	18	<1	29	21	0.91	12
R 155	3952	Little Duncan Bay, SW	R	S		RC	Chert w/ seams of py	<5	0.9	102	11	38	2	26	6	0.61	<5
R 156	9648	Little Duncan Bay	R	Rep	0.8	OC	Vuggy qz-cc vn w/ po blebs in hbl porphyry	<5	0.6	255	10	196	2	25	18	1.5	10
R 157	24	Duncan Canal area	R	Rep	3	OC	Fest marble	<5	<0.1	107	7	66	1	31	15	0.71	38
R 158	25	Duncan Canal area	R	Rep	0.4	OC	Fest qz & marble	<5	<0.1	104	5	59	1	48	15	0.79	74
R 159	26	Duncan Canal area	R	G	0.3	RC	Qz-cc vn w/ sulf	<5	<0.1	3	11	15	1	20	2	0.25	<5
R 160	210	Duncan Canal area	R	Rep	5	OC	Fest ls & marble	<5	<0.1	73	7	42	1	17	7	0.37	19
R 161	186	Totem Bay	SS					<5	0.1	12	21	85	3	11	9	1.37	14
R 162	187	Totem Bay	SS					<5	0.3	24	37	218	4	22	26	2.62	11
R 163	184	Little Totem Bay	SS					12	<0.1	15	25	160	5	16	16	2.49	9
R 164	183	Little Totem Bay	SS					<5	0.2	17	24	189	13	16	14	2.38	42
R 165	182	Little Totem Bay	SS					6	<0.1	16	35	280	6	17	20	2.38	18
R 166	9632	Agony	SS					8	<0.1	5	10	14	<1	3	2	0.46	<5
R 167	9633	Agony	SS					<5	<0.1	11	15	82	5	11	11	1.68	15
R 168	525	Fair I	R	RC		OC	Qz, cc, gw	<5	<0.1	194	6	103	2	38	28	2.58	<5
R 169	523	Fair I	SS					5	0.2	23	8	47	<1	11	13	1.25	<5
R 170	524	Fair I	SS					<5	<0.1	44	11	88	<1	23	58	2.54	11
R 171	282	Helen S Mine area	R	G	1	OC	Fest sil gs sc	<5	<0.1	170	4	98	2	51	28	0.88	6
R 172	830	Scott Gold	R	S		FL	Green br volc	<5	<0.1	56	6	34	<1	20	9	1.07	15
R 173	728	Scott Gold	SS					6	<0.1	34	8	59	<1	24	24	1.83	7
R 174	725	Scott Gold	SS					<5	<0.1	64	7	83	<1	33	45	2.57	7
R 175	726	Scott Gold	SS					6	<0.1	34	9	46	2	14	72	1.79	<5
R 176	828	Scott Gold	R	G	0.1	FL	Qz vn	<5	<0.1	115	3	39	3	22	13	1.83	<5
R 177	829	Scott Gold	SS					<5	<0.2	15	9	37	<1	10	27	1.25	<5
R 178	727	Scott Gold	SS					6	<0.1	38	5	39	<1	14	12	1.55	<5
R 179	684	Lost Lake, S Side	R	G	0.3	OC	Fest sil gs w/ 3% py	110	<0.1	684	5	108	3	24	63	1.42	<5
R 180	8904	Harvey Lake	R	G		OC	Sil gs w/ 7% py	<5	<0.1	155	3	97	2	51	41	2.91	11
R 181	8745	Mary Jo	R	Rep	0.4	OC	Lens of silica w/ 10% aspy(?)	34	<0.1	34	14	39	26	25	13	0.09	80
R 182	8746	Mary Jo	R	C	0.4	OC	Fest sc w/ nodules silica w/ msv aspy, py	6	<0.1	78	11	122	28	44	28	0.25	49
R 183	2638	Charlie's Creek	R	G		OC	Sil msv py	<5	<0.2	75	<1	26	18	21	11	0.09	58
R 184	816	South Buttersworth	SS					59	<0.2	34	38	48	1	10	8	1.21	9

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 139	3917	Duncan Canal, W side	R	41.30%	*	<5	0.02	<0.2	45	0.12	<2	0.435	<0.01	<1	<0.01	9	<0.01	1	<5	<5	<20		423	<10	<0.01	12	<20	
R 140	526	Duncan Canal, W side	SS	992	*	<5	0.72	0.5	30	3.73	<2	0.752	0.1	6	0.93	1082	0.04	3	<5	<5	<20		34	<10	0.11	55	<20	
R 141	517	Duncan Canal, W side	SS	993	*	<5	0.6	0.4	34	4.21	<2	0.325	0.09	7	0.98	919	0.06	4	<5	<5	<20		34	<10	0.12	67	<20	
R 142	516	Duncan Canal, W side	SS	991	*	<5	0.41	0.2	16	7.95	<2	0.268	0.12	6	0.45	803	0.02	10	<5	<5	<20		28	<10	0.1	142	<20	
R 143	515	Duncan Canal, W side	SS	1108	*	<5	0.28	<0.2	12	1.03	2	0.171	0.08	6	0.31	206	0.02	2	<5	<5	<20		20	<10	0.06	26	<20	
R 144	514	Duncan Canal, W side	SS	1941	*	<5	0.56	0.6	20	5.1	<2	0.259	0.17	9	0.73	2331	0.04	4	<5	<5	<20		34	<10	0.08	60	<20	
R 145	8752	NW Duncan Canal	SS	959	*	<5	0.36	<0.2	19	2.43	<2	0.782	0.08	6	0.52	255	0.03	4	<5	<5	<20		21	<10	0.09	52	<20	
R 146	8751	NW Duncan Canal	SS	70		<5	0.31	<0.2	16	1.28	3	0.326	0.06	5	0.34	175	0.02	3	<5	<5	<20		20	<10	0.08	31	<20	
R 147	8651	Kupreanof Pyrite area	R	127	*	<5	0.04	<0.2	250	0.35	<2	0.018	<0.01	<1	0.01	32	0.01	<1	<5	<5	<20		4	<10	<0.01	1	<20	
R 148	49	Castle River area	R	635	*	<5	3.95	0.6	186	2.27	<2	0.15	0.04	4	0.83	522	0.04	2	<5	6	<20		201	<10	<0.01	55	<20	
R 149	935	Bains Cove area	R	197	*	<5	0.08	<0.2	245	0.87	<2	0.013	0.04	6	0.15	311	0.02	<1	<5	<5	<4	*	7	<10	<0.01	9	9	*
R 150	8889	Bains Cove area	R	72	*	<5	>10	<0.2	142	1.11	<2	0.03	0.03	11	0.35	1334	0.04	1	<5	6	<4	*	989	<10	<0.01	15	8	*
R 151	8887	Bains Cove area	R	35	*	<5	>10	<0.2	3	0.22	<2	0.019	0.02	<1	0.23	391	<0.01	<1	<5	<5	<4	*	484	<10	<0.01	3	8	*
R 152	542	Little Duncan Bay	SS	1101	*	<5	0.62	0.4	22	2.7	<2	0.155	0.13	7	0.68	375	0.07	4	<5	<5	<20		36	<10	0.1	56	<20	
R 153	8814	Little Duncan Bay, SW	R	39	*	<5	0.03	43.6	162	9.2	3	1.44	<0.01	<1	0.02	30	<0.01	<1	<5	<5	<20		4	<10	<0.01	2	<20	
R 154	3953	Little Duncan Bay, SW	R	3760	*	<5	1.06	<0.2	59	3.31	5	<0.01	0.14	5	0.7	490	0.05	<1	<5	<5	<20		54	<10	0.01	23	<20	
R 155	3952	Little Duncan Bay, SW	R	3918	*	<5	0.15	0.2	140	3.58	3	0.028	0.15	4	0.39	136	0.02	<1	<5	<5	<20		10	<10	<0.01	13	<20	
R 156	9648	Little Duncan Bay	R	213	*	<5	4.79	1.6	112	3.82	<2	0.098	0.02	5	1.48	584	0.09	<1	<5	8	<20		178	<10	0.11	114	<20	
R 157	24	Duncan Canal area	R	236	*	<5	>10	<0.2	76	4.93	<2	0.298	0.07	2	3.52	832	0.02	4	<5	18	<20		332	<10	<0.01	125	<20	
R 158	25	Duncan Canal area	R	446	*	<5	>10	<0.2	84	5.42	<2	0.09	0.05	4	4.39	1083	0.01	3	<5	14	<20		597	<10	<0.01	90	<20	
R 159	26	Duncan Canal area	R	771	*	<5	5.99	<0.2	165	1.36	<2	0.022	0.02	<1	3.1	573	0.01	3	<5	<5	<20		445	<10	<0.01	15	<20	
R 160	210	Duncan Canal area	R	183	*	<5	>10	<0.2	54	3.76	<2	0.434	0.05	2	4.63	713	0.02	4	10	10	<20		360	<10	<0.01	79	<20	
R 161	186	Totem Bay	SS	53		<5	0.4	0.2	18	2.9	<2	0.067	0.12	18	0.53	452	0.22	<1	<5	<5	<20		30	<10	0.06	48	<20	
R 162	187	Totem Bay	SS	43		<5	0.5	0.3	19	6.98	2	0.04	0.1	24	1.22	2836	0.25	<1	<5	<5	<20		54	<10	0.13	76	<20	
R 163	184	Little Totem Bay	SS	60		<5	0.35	0.3	18	3.82	4	0.081	0.07	20	0.78	2076	0.14	1	<5	<5	<20		61	<10	0.1	52	<20	
R 164	183	Little Totem Bay	SS	45		<5	0.3	0.2	17	9.45	4	0.07	0.09	18	0.83	334	0.21	2	<5	<5	<20		60	<10	0.1	73	<20	
R 165	182	Little Totem Bay	SS	78		<5	0.32	0.5	16	5.28	3	0.051	0.1	18	0.93	3054	0.14	2	<5	<5	<20		59	<10	0.12	58	<20	
R 166	9632	Agony	SS	28		<5	0.25	<0.2	8	0.52	<2	0.034	0.05	8	0.16	77	0.05	<1	<5	<5	<20		19	<10	0.07	14	<20	
R 167	9633	Agony	SS	43		<5	0.43	<0.2	17	3.99	<2	0.088	0.09	15	0.68	549	0.13	2	<5	<5	<20		55	<10	0.13	63	<20	
R 168	525	Fair I	R	1648	*	<5	3.35	<0.2	101	5.73	4	0.523	0.02	4	2.17	1401	0.13	14	<5	18	2	*	50	<10	0.56	207	<20	
R 169	523	Fair I	SS	838	*	<5	0.57	<0.2	19	2.28	<2	0.139	0.06	8	0.46	1625	0.02	4	<5	<5	<20		26	<10	0.1	56	<20	
R 170	524	Fair I	SS	1828	*	<5	0.65	0.3	66	7.11	2	0.224	0.11	6	1.25	7629	0.02	10	<5	7	<20		25	<10	0.12	154	<20	
R 171	282	Helen S Mine area	R	449	*	<5	6.9	0.3	108	9.23	5	0.184	0.04	4	3.98	1394	0.02	<1	<5	24	<20		90	<10	<0.01	210	<20	
R 172	830	Scott Gold	R	1540	*	<5	0.8	<0.2	71	3.11	3	0.027	0.18	3	0.72	294	0.07	5	<5	<5	<4	*	25	<10	0.22	87	9	*
R 173	728	Scott Gold	SS	555	*	<5	0.48	0.3	47	3.66	<2		0.09	5	0.83	1355	0.03	8	<5	<5	<20		23	<10	0.13	96	<20	
R 174	725	Scott Gold	SS	486	*	<5	0.55	0.2	78	5.33	<2		0.1	5	1.17	3124	0.02	10	<5	5	<20		25	<10	0.18	126	<20	
R 175	726	Scott Gold	SS	25	*	<5	0.42	0.3	54	5.13	<2		0.06	4	0.74	5008	0.02	10	<5	<5	<20		21	<10	0.24	123	<20	
R 176	828	Scott Gold	R	321	*	<5	1.34	<0.2	64	3.07	3	0.025	0.05	<1	0.88	334	<0.01	4	<5	<5	<4	*	15	<10	0.47	75	9	*
R 177	829	Scott Gold	SS	31	*	<5	0.45	<0.2	33	3.54	<2		0.05	4	0.57	2966	0.02	10	<5	<5	<20		19	<10	0.14	111	<20	
R 178	727	Scott Gold	SS	535	*	<5	0.41	<0.2	66	2.08	<2		0.05	3	0.88	345	0.02	6	<5	<5	<20		19	<10	0.2	64	<20	
R 179	684	Lost Lake, S Side	R	271	*	<5	2.56	0.9	8	>10	<2	1.257	0.01	12	2.04	3618	<0.01	35	<5	35	<4	*	28	<10	<0.01	397	12	*
R 180	8904	Harvey Lake	R	424	*	<5	1.18	0.4	108	>10	<2	0.032	0.02	2	2.47	877	0.05	8	<5	13	<4	*	23	<10	0.38	174	10	*
R 181	8745	Mary Jo	R	232	*	<5	>10	0.2	23	>10	<2	1.306	0.03	<1	0.17	797	<0.01	<1	6	<5	26	*	105	<10	0.01	18	<20	
R 182	8746	Mary Jo	R	3161	*	<5	3.73	0.4	57	>10	<2	1.576	0.07	<1	0.18	505	<0.01	<1	17	<5	28	*	53	<10	<0.01	32	<20	
R 183	2638	Charlie's Creek	R	10		<2	4.75	<.5	35	15.00	<10	1.81	0.01	<10	0.06	340	<0.01		12	2			69		<.01	10	<10	
R 184	816	South Buttersworth	SS	472	*	<5	0.29	0.2	11	3.61	4		0.04	3	0.54	221	0.03	14	<5	5	<20		16	<10	0.06	162	<20	

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 185	817	South Buttersworth	R	G		FL	Qz	14	<0.1	14	<2	8	5	7	2	0.15	<5
R 186	815	South Buttersworth	R	G		OC	Fest volc	43	<0.1	96	4	70	4	54	28	1.15	45
R 187	2839	Mitkof Is, FS Rd 6246	R	G		OC	Qz vn w/ py	<5	<0.1	30	16	61	49	5	8	0.76	<5
R 188	429	Mitkof Is, FS Rd 6246	R	C	1.5	TP	Qz vn w/ narrow band of py	<5	<0.1	15	11	6	22	4	3	0.08	<5
R 189	405	Mitkof Is, FS Rd 6245	R	G	0.4	RC	Qz vn w/ po	<5	<0.1	48	4	8	2	7	4	0.26	<5
R 190	6356	Sumner Mountains	R	G		FL	Ar w/ dissem po	8	0.3	70	8	175	6	42	26	2.37	<5
R 191	2822	Mitkof Is, FS Rd 6282	R	C	20	OC	Metamorphics w/ po	<5	0.3	54	6	118	3	33	24	1.4	<5
R 192	406	Mitkof Is, FS Rd 6282	R	G	0.5	RC	Qz vn w/ po hosted in hornfels	<5	<0.1	32	7	126	2	15	16	2.24	<5
R 193	403	Mitkof Is, FS Rd 6245	R	S		RC	Fest qz w/ po blebs	<5	<0.1	17	11	9	1	4	4	0.31	<5
R 194	404	Mitkof Is, FS Rd 6245	R	G		RC	Qz vn w/ blebs & cubes of py	<5	<0.1	12	5	14	2	7	15	0.22	9
R 195	2821	Mitkof Is, FS Rd 6245	R	G		OC	Shear zone w/ py	<5	0.3	62	10	84	3	61	13	2.3	<5
R 196	8910	St. John Harbor	R	RC	3	OC	Sil rhyolite w/ fg py	<5	<0.1	4	11	7	3	4	<1	0.37	19
R 197	9649	Zarembo Is, FS Rd 6590	R	G		TP	Alt intrusive w/ qz vns & py	96	5.3	7	29	20	27	8	5	0.28	116
R 198	283	Zarembo Is, FS Rd 6590	R	S	0.3	TP	Fest rhyolite	16	<0.1	5	23	21	2	2	<1	0.33	<5
R 199	8926	NW Zarembo Island	R	G		RC	Fest ar w/ ~ 5% py	<5	<0.1	16	5	106	1	29	33	2.56	16
R 200	292	Zarembo Is, FS Rd 6592	R	C	0.4	OC	Fest qz & green sc w/ py	7	0.2	63	4	16	<1	7	6	0.73	9
R 201	9652	Zarembo Is, FS Rd 6592	R	Rep	1	OC	Shear w/ py in alt volc	23	0.4	19	15	95	3	12	20	2.44	102
R 202	8925	NW Zarembo Island	R	G	0.5	OC	Gs w/ qz bands	<5	0.3	90	<2	51	2	13	18	1.81	9
R 203	521	Craig Point	SS					<5	<0.1	14	13	93	5	17	12	2	<5
R 204	9716	Craig Point	SS					11	<0.1	15	12	117	<1	16	21	1.96	9
R 205	522	Craig Point	SS					6	<0.1	10	7	58	<1	13	11	1.74	<5
R 206	9717	Craig Point	SS					15	0.2	16	18	129	<1	18	24	2.18	10
R 207	324	Zarembo Is, FS Rd 52022	R	S	0.4	OC	Alt sericitic granite w/ py	12	<0.1	12	9	40	<1	4	4	0.67	<5
R 208	9670	Zarembo Is, FS Rd 52022	R	Rep		OC	Heavily weathered fest intrusive	13	<0.1	16	13	82	<1	7	4	0.8	<5
R 209	323	Zarembo Is, FS Rd 52022	R	S		RC	Hbl bt granite w/ sulf replacing mafics	28	<0.1	11	14	49	2	3	1	0.49	<5
R 210	9659	Zarembo Is, FS Rd 6590	R	G		FL	Sil rhyolite w/ py seams	14	0.5	104	41	254	7	3	<1	0.89	25
R 211	302	Zarembo Is, FS Rd 6590	R	G		FL	Banded gs w/ seams & scattered blebs of py	27	<0.1	39	33	222	6	2	1	0.9	40
R 212	290	Zarembo Is, FS Rd 6590	R	G		TP	Fest gs w/ sulf	9	0.1	116	5	54	1	19	47	3.14	14
R 213	289	Zarembo Is, FS Rd 6590	R	S	0.2	TP	Fest, qz monzonite w/ py	9	<0.1	15	20	34	4	2	<1	0.36	13
R 214	287	Zarembo Is, FS Rd 6593	R	G	0.8	TP	Vuggy fest qz vn	8	<0.1	13	4	14	1	9	3	0.37	<5
R 215	9650	Zarembo Is, FS Rd 6593	R	G		TP	Qz vn in slate	8	0.2	99	10	42	2	11	4	0.85	<5
R 216	285	Zarembo Is, FS Rd 52021	R	G	0.3	RC	Vuggy qz vn w/ py blebs	9	<0.1	58	<2	5	<1	6	3	0.27	<5
R 217	284	Zarembo Is, FS Rd 6590	R	G	0.3	OC	Phy w/ py blebs	18	<0.1	62	4	110	2	22	18	2.46	<5
R 218	286	Zarembo Is, FS Rd 6590	R	C	0.7	OC	Fest sil shear w/ py in slate	15	<0.1	19	9	46	2	31	8	1.19	<5
R 219	288	Zarembo Is, FS Rd 6597	R	G	0.6	TP	Fest qz vn w/ py	65	0.3	13	25	57	2	8	2	0.53	179
R 220	297	Zarembo Is, FS Rd 6585	R	S		RC	Fest andesite w/ blebs & banded fg py	267	0.6	21	9	83	<1	12	23	2.17	172
R 221	9655	Zarembo Is, FS Rd 6585	R	Rep		RC	Alt andesite w/ py & chalcedony in vugs	116	1.9	31	8	140	<1	6	25	2.45	331
R 222	9653	Zarembo Is, FS Rd 6587	R	G		RC	Fest, sil, gossany float	44	0.6	8	31	76	5	9	10	1.51	131
R 223	294	Zarembo Is, FS Rd 6594	R	C	0.5	OC	Fest rhyolite w/ fg py	7	0.2	8	21	111	6	1	<1	0.54	20
R 224	591	SW Zarembo	R	G	2	OC	Vent br (andesite)	<5	0.8	12	144	160	3	7	17	2.97	<5
R 225	592	SW Zarembo	R	C	0.5	OC	Cc lens & andeste br w/ dissem & bands of po	<5	0.3	8	46	161	7	4	21	1.11	6
R 226	590	SW Zarembo	R	G	0.2	OC	Cc vein w/ wall rock	<5	0.4	9	75	94	7	1	3	0.73	<5
R 227	8835	SW Zarembo	R	Rep		OC	Andesite br	<5	0.7	31	58	113	5	21	20	2.51	<5
R 228	201	Elephant Nose	R	C	1.5	OC	Qz vn	<5	0.2	7	11	16	2	7	<1	0.02	<5
R 229	1	Elephant Nose, E of	R	Rep	2	RC	Fest qz vn	<5	<0.1	5	23	6	2	15	<1	0.04	<5
R 230	2	Elephant Nose, E of	R	C	1.5	OC	Qz vn	<5	<0.1	22	<2	2	1	7	<1	0.02	<5

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 185	817	South Buttersworth	R	109	*	<5	0.11	<0.2	156	0.97	<2	0.035	<0.01	<1	0.1	50	0.02	1	6	<5	<4	*	3	<10	<0.01	29	9	*
R 186	815	South Buttersworth	R	307	*	<5	>10	<0.2	19	5.85	<2	0.291	0.07	2	4.19	1386	0.03	10	<5	21	<4	*	116	<10	<0.01	150	9	*
R 187	2839	Mitkof Is, FS Rd 6246	R	760	*	<5	3.1	<0.2	41	3.32	<2	0.027	0.39	<1	0.52	1065	0.06	6	<5	<5	<20		117	<10	0.07	60	<20	
R 188	429	Mitkof Is, FS Rd 6246	R	<10	*	<5	0.3	<0.2	126	0.83	<2	0.019	0.01	<1	0.03	161	0.03	<1	<5	<5	<20		10	<10	<0.01	4	<20	
R 189	405	Mitkof Is, FS Rd 6245	R	209	*	<5	0.62	<0.2	230	0.84	<2	<0.01	0.09	<1	0.08	133	0.05	2	<5	<5	<20		16	<10	0.01	15	<20	
R 190	6356	Sumner Mountains	R	872	*	<5	0.25	1.2	99	5.67	2	0.014	1.39	8	2.17	1104	0.09	10	<5	9	<20		18	<10	0.08	169	<20	
R 191	2822	Mitkof Is, FS Rd 6282	R	1485	*	<5	0.52	0.4	70	4.36	<2	0.011	0.61	<1	1.13	613	0.07	8	<5	<5	<20		19	<10	0.07	82	<20	
R 192	406	Mitkof Is, FS Rd 6282	R	1212	*	<5	0.4	0.2	89	4.52	2	0.01	0.8	4	1.82	932	0.08	11	<5	<5	<20		24	<10	0.11	110	<20	
R 193	403	Mitkof Is, FS Rd 6245	R	322	*	<5	0.94	<0.2	154	1.07	<2	0.041	0.16	<1	0.03	110	0.07	<1	<5	<5	<20		17	<10	<0.01	7	<20	
R 194	404	Mitkof Is, FS Rd 6245	R	59	*	<5	1.2	<0.2	225	2.97	<2	0.013	0.02	<1	0.12	208	0.02	2	<5	<5	<20		33	<10	0.04	18	<20	
R 195	2821	Mitkof Is, FS Rd 6245	R	521	*	<5	1.36	0.9	110	3.88	<2	0.029	0.14	4	0.98	819	0.01	6	<5	7	<20		99	<10	0.1	69	<20	
R 196	8910	St. John Harbor	R	318	*	<5	0.02	<0.2	152	0.97	<2	<0.01	0.24	16	0.03	31	0.12	<1	<5	<5	10	*	4	<10	<0.01	3	10	*
R 197	9649	Zarembo Is, FS Rd 6590	R	154	*	<5	<0.01	0.6	97	6.9	<2	0.136	0.11	2	0.02	11	<0.01	<1	24	<5	<20		2	<10	<0.01	12	<20	
R 198	283	Zarembo Is, FS Rd 6590	R	143	*	<5	0.02	<0.2	52	0.61	<2	<0.01	0.28	20	<0.01	15	0.03	<1	<5	<5	<20		3	<10	<0.01	<1	<20	
R 199	8926	NW Zarembo Island	R	303	*	<5	5.04	0.3	51	8.11	<2	0.025	0.18	11	2.58	1450	0.03	5	<5	11	4	*	472	<10	<0.01	111	12	*
R 200	292	Zarembo Is, FS Rd 6592	R	1051	*	<5	0.12	<0.2	101	1.38	<2	0.012	0.34	13	0.18	237	0.03	<1	<5	<5	<20		8	<10	<0.01	8	<20	
R 201	9652	Zarembo Is, FS Rd 6592	R	414	*	<5	0.28	0.6	49	7.54	4	0.028	0.28	17	1.69	577	0.03	<1	<5	8	<20		14	<10	<0.01	99	<20	
R 202	8925	NW Zarembo Island	R	364	*	<5	1.76	0.5	100	3.54	<2	<0.01	0.05	6	1.49	641	0.13	7	<5	11	<4	*	89	<10	0.08	115	11	*
R 203	521	Craig Point	SS	747	*	<5	1.25	0.3	505	3.77	<2	0.078	0.24	20	0.79	954	0.2	5	<5	7	5	*	104	<10	0.19	78	<20	
R 204	9716	Craig Point	SS	810	*	<5	0.68	<0.2	26	5.12	<2	0.18	0.12	8	0.9	1922	0.04	6	<5	<5	<20		46	<10	0.18	95	<20	
R 205	522	Craig Point	SS	628	*	<5	0.39	<0.2	27	3.74	3	0.086	0.08	9	0.6	659	0.03	6	<5	<5	<20		28	<10	0.16	69	<20	
R 206	9717	Craig Point	SS	793	*	<5	0.68	0.2	28	6	<2	0.254	0.15	8	0.96	2536	0.04	6	<5	<5	<20		46	<10	0.19	100	<20	
R 207	324	Zarembo Is, FS Rd 52022	R	254		<5	0.09	0.3	82	1.45	<2	0.018	0.16	21	0.05	496	0.05	<1	<5	<5	<20		16	<10	<0.01	14	<20	
R 208	9670	Zarembo Is, FS Rd 52022	R	253		<5	0.12	0.3	78	2.2	<2	0.032	0.23	15	0.09	312	0.04	<1	<5	<5	<20		16	<10	<0.01	20	<20	
R 209	323	Zarembo Is, FS Rd 52022	R	249		<5	0.14	<0.2	67	0.79	<2	0.023	0.13	<1	0.15	132	0.08	<1	<5	<5	<20		34	<10	0.02	9	<20	
R 210	9659	Zarembo Is, FS Rd 6590	R	47	*	<5	0.03	0.4	77	4.46	7	<0.01	0.11	67	0.15	590	0.06	2	<5	<5	<20		4	<10	<0.01	2	<20	
R 211	302	Zarembo Is, FS Rd 6590	R	20	*	<5	0.01	0.7	61	4.05	7	<0.01	0.14	37	0.09	929	0.05	3	<5	<5	<20		2	<10	<0.01	2	<20	
R 212	290	Zarembo Is, FS Rd 6590	R	254	*	<5	0.98	<0.2	12	6.65	3	<0.01	0.05	<1	2.82	739	0.05	<1	<5	8	<20		72	<10	0.2	157	<20	
R 213	289	Zarembo Is, FS Rd 6590	R	159	*	<5	0.06	0.2	62	0.84	3	<0.01	0.14	24	0.02	114	0.07	<1	<5	<5	<20		3	<10	<0.01	1	<20	
R 214	287	Zarembo Is, FS Rd 6593	R	220	*	<5	0.07	<0.2	136	0.81	<2	<0.01	0.12	2	0.13	445	<0.01	<1	<5	<5	<20		6	<10	<0.01	7	<20	
R 215	9650	Zarembo Is, FS Rd 6593	R	399	*	<5	5.63	0.2	90	1.61	<2	<0.01	0.13	3	0.54	679	0.02	<1	<5	<5	<20		461	<10	<0.01	17	<20	
R 216	285	Zarembo Is, FS Rd 52021	R	4775	*	<5	0.1	<0.2	158	0.44	<2	0.078	0.25	<1	0.05	57	0.01	<1	<5	<5	<20		41	<10	0.01	5	<20	
R 217	284	Zarembo Is, FS Rd 6590	R	862	*	<5	0.57	<0.2	33	5.2	<2	<0.01	0.7	3	1.48	784	0.03	<1	<5	<5	<20		42	<10	0.16	55	<20	
R 218	286	Zarembo Is, FS Rd 6590	R	509	*	<5	4.77	<0.2	98	1.74	<2	0.018	0.13	4	0.5	1172	0.01	<1	<5	<5	<20		321	<10	<0.01	17	<20	
R 219	288	Zarembo Is, FS Rd 6597	R	545	*	<5	1.56	0.9	150	2.01	<2	0.015	0.25	<1	0.14	341	<0.01	<1	<5	<5	<20		53	<10	<0.01	13	<20	
R 220	297	Zarembo Is, FS Rd 6585	R	225	*	<5	1.41	1	29	8.38	8	0.141	0.13	11	1.32	708	0.05	<1	18	9	<20		27	<10	0.02	146	<20	
R 221	9655	Zarembo Is, FS Rd 6585	R	179	*	<5	0.24	1.4	19	13.1	5	0.024	0.17	17	0.94	355	0.02	<1	<5	12	<20		11	<10	<0.01	112	<20	
R 222	9653	Zarembo Is, FS Rd 6587	R	564	*	<5	0.1	0.6	66	3.76	6	0.012	0.23	18	0.64	1346	0.02	<1	<5	<5	<20		5	<10	0.01	36	<20	
R 223	294	Zarembo Is, FS Rd 6594	R	1674	*	<5	0.05	0.8	30	1.93	2	0.215	0.34	28	<0.01	23	0.03	<1	<5	<5	<20		5	<10	<0.01	<1	<20	
R 224	591	SW Zarembo	R	272	*	<5	3.28	0.5	23	5.68	4	0.056	0.19	9	1.21	959	0.13	4	<5	8	<4	*	97	<10	<0.01	65	5	*
R 225	592	SW Zarembo	R	198	*	<5	>10	0.7	11	>10	<2	0.048	0.06	6	1.65	4671	0.04	7	<5	18	<4	*	274	<10	<0.01	112	<4	*
R 226	590	SW Zarembo	R	3497	*	<5	>10	0.8	2	2.15	<2	<0.01	0.06	4	0.32	5937	0.03	<1	<5	<5	<4	*	804	<10	<0.01	14	<4	*
R 227	8835	SW Zarembo	R	253	*	<5	6.61	0.3	59	6.56	4	<0.01	0.12	8	1	2006	0.07	5	<5	14	<4	*	170	<10	<0.01	87	<4	*
R 228	201	Elephant Nose	R	45	*	<5	0.03	<0.2	248	0.31	<2	0.014	<0.01	<1	<0.01	41	<0.01	<1	<5	<5	<20		3	<10	<0.01	3	<20	
R 229	1	Elephant Nose, E of	R	<10	*	<5	0.14	<0.2	254	0.46	<2	<0.01	<0.01	<1	0.01	70	<0.01	<1	<5	<5	<20		11	<10	<0.01	1	<20	
R 230	2	Elephant Nose, E of	R	<10	*	<5	0.02	<0.2	281	0.34	<2	<0.01	<0.01	<1	<0.01	33	<0.01	<1	<5	<5	<20		4	<10	<0.01	<1	<20	

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 231	202	Elephant Nose	R	RC	10	OC	Irregular qz lenses	<5	<0.1	7	6	9	2	14	<1	0.02	<5
R 232	4	Elephant Nose, E of	R	G	0.5	OC	Qz , cc, ser lens in vn w/ limonite, py, mal	<5	<0.1	46	4	18	3	15	5	0.4	<5
R 233	3	Elephant Nose, E of	R	SC	6@.5	OC	Qz vn	<5	<0.1	14	<2	6	3	17	1	0.15	<5
R 234	203	Elephant Nose, E of	R	Rep	2.5	OC	Qz vn	<5	0.5	18	75	39	3	12	3	0.27	<5
R 235	5	Elephant Nose, E of	R	Rep	1	OC	Irregular qz vn	<5	<0.1	19	8	7	4	21	2	0.1	<5
R 236	7	Elephant Nose, E of	SS					<5	0.2	122	8	127	1	20	22	2.42	6
R 237	6	Elephant Nose, E of	R	C	0.7	OC	Qz vn w/ mal	<5	<0.1	8	<2	2	2	10	<1	0.02	<5
R 238	2618	Wedge Point	R	Rep	1.3	OC	Qz vn w/ sparse py	<5	<0.2	20	68	214	8	4	<1	0.41	10
R 239	2619	Wedge Point	R	S		RC	Hornfelsed slate w/ py	<5	0.2	62	16	170	3	48	23	1.8	2
R 240	478	Etolin Is, FS Rd 6544	R	C	0.4	OC	Sil, fest, felsic intrusive w/ py along shears	22	0.3	21	11	29	16	7	<1	0.41	83
R 241	477	Etolin Is, FS Rd 6544	R	G	0.3	TP	Fest, sil metaseds w/ fg py	<5	<0.1	14	6	48	6	5	<1	1.93	21
R 242	834	Quiet Harbor	R	S	0.25	TP	Qz vn	10	0.2	5	9	17	2	4	<1	0.23	16
R 243	731	Quiet Harbor	R	G	0.4	RC	Fest qz in hornfels	7	<0.1	23	9	48	4	12	4	2.51	26
R 244	8712	Etolin Is, FS Rd 51009	R	S		RC	Dioritic dike w/ fg po intruding marble	7	0.6	244	34	174	6	24	58	2.03	79
R 245	460	Etolin Is, FS Rd 51009	R	G	0.6	TP	Sil intrusive w/ po, cp	12	0.6	177	20	77	12	16	38	1.77	107
R 246	8827	Etolin Island, FS Rd 6545	R	S		OC	Rhyolite	8	0.4	12	78	578	6	5	<1	0.57	32
R 247	729	Kindergarten Bay	R	G	0.3	RC	Rhyolite w/ py in small fractures	6	<0.1	28	48	52	5	3	<1	0.18	20
R 248	832	Kindergarten Bay	R	G		RC	Fest sil volc	8	<0.1	2	12	26	4	2	<1	0.49	17
R 249	831	Kindergarten Bay	S					<5	<0.2	9	56	79	7	4	6	6.76	16
R 250	8713	Etolin Is, FS Rd 6540	R	Rep		RC	Andesite w/ dissem po	<5	<0.1	131	11	75	3	10	21	3.47	754
R 251	8714	Etolin Is, FS Rd 6540	R	S		TP	Rhyolite w/ py in small fractures	<5	0.2	12	27	145	6	4	<1	0.3	<5
R 252	8730	Etolin Is, FS Rd 51540	R	RC		TP	Fest rhyolite w/ dissem po	<5	<0.1	32	23	97	7	2	<1	0.3	6
R 253	8722	Etolin Is, FS Rd 51540	R	Rep	0.5	RC	Fest qz vn w/ po in ar	6	2.2	152	77	393	5	10	8	0.55	<5
R 254	461	Etolin Is, FS Rd 51581	R	C	0.5	TP	Qz vn	<5	<0.1	19	6	33	3	11	3	1.69	18
R 255	8715	Etolin Is, FS Rd 6539	R	Rep		TP	Pink to gray, mg, fel intrusive w/ gray sulf	<5	0.2	14	27	178	5	4	<1	0.33	<5
R 256	462	Etolin Is, FS Rd6547	R	G		RC	Fest, sil dike w/ dissem py	<5	<0.1	8	26	115	7	9	<1	0.24	5
R 257	3822	Wrangell Airport Quarry	R	Rep		TP	Gray, mg, bt granite	<5	<0.1	10	<2	103	2	9	3	1.70	<5
R 258	3821	Wrangell Airport Quarry	R	G		TP	Peg dike	<5	<0.1	11	3	5	8	12	<1	0.41	<5
R 259	3823	Wrangell Airport Quarry	R	Rep		TP	Alt granite w/ epidote	<5	<0.1	14	5	112	3	7	5	2.03	<5
R 260	260	Pat Creek	R	RC		FL	Qz diorite boulder	<5	<0.1	5	36	70	<1	4	3	0.95	<5
R 261	94	Pat Creek	SS					<5	0.2	26	25	108	3	48	47	2.5	<5
R 262	83	Wrangell Is, FS Rd 50050	R	G		RC	Fest metaseds w/ dissem po	<5	0.3	62	10	50	2	60	13	6.41	<5
R 263	246	Wrangell Is, FS Rd 50050	R	Rep	0.5	RC	Alt volc w/ fg dissem po	<5	<0.1	71	11	43	2	32	11	3.59	<5
R 264	74	Wrangell Is, FS Rd 6265	R	G	0.4	RC	Qz vn w/ muscovite	<5	<0.1	27	5	39	1	49	5	1.22	<5
R 265	75	Wrangell Is, FS Rd 6265	R	G	0.5	RC	Ar w/ bands of qz & po	7	0.3	72	7	119	3	116	14	2.74	<5
R 266	242	Wrangell Is, FS Rd 6265	R	G		TP	Qz vn w/ po in mica sc	<5	0.2	52	9	56	<1	50	7	1.97	<5
R 267	245	Wrangell Is, FS Rd 6265	R	Rep	0.4	RC	Qz vn in mica sc	<5	0.2	99	6	74	<1	60	17	1.58	<5
R 268	82	Wrangell Is, FS Rd 6265	R	G	0.8	RC	Fest gossany sil bt sc	<5	<0.1	47	5	56	1	36	8	1.76	<5
R 269	81	Wrangell Is, FS Rd 6265	R	G	0.6	RC	Garnet sc w/ qz lens & sulf	6	<0.1	39	3	73	1	56	12	2.74	<5
R 270	789	Jerry	R	G		FL	Qz	<5	<0.1	2	<2	<1	4	3	<1	0.1	<5
R 271	873	Jerry	SS					<5	0.2	14	4	34	<1	25	8	0.83	11
R 272	790	Jerry	R		0.2	OC	Qz stringer	<5	<0.1	2	3	3	3	12	7	0.06	<5
R 273	874	Jerry	SS					<5	0.2	22	5	74	5	37	26	1.31	14
R 274	875	Jerry	R	S		FL	Qz float	<5	<0.1	3	<2	3	7	7	2	0.05	<5
R 275	791	Jerry	R	G	1	OC	Qz vn in fest sc	<5	0.2	20	32	91	26	57	10	1.36	<5
R 276	778	N of Libby Creek	R	Rep	2	OC	Sil muscovite sc w/ lenses of qz + sulf	<5	0.7	19	4	143	6	9	10	1.3	<5

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 231	202	Elephant Nose	R	50	*	<5	<0.01	<0.2	281	0.3	<2	<0.01	<0.01	<1	<0.01	29	<0.01	<1	<5	<5	<20		3	<10	<0.01	2	<20	
R 232	4	Elephant Nose, E of	R	146	*	<5	1.06	0.2	214	1.32	<2	0.014	0.07	7	0.17	315	0.04	<1	<5	<5	<20		75	<10	<0.01	7	<20	
R 233	3	Elephant Nose, E of	R	93	*	<5	0.25	<0.2	261	0.58	<2	<0.01	0.05	<1	0.04	100	0.02	<1	<5	<5	<20		21	<10	<0.01	2	<20	
R 234	203	Elephant Nose, E of	R	21	*	<5	1.11	0.2	191	1.1	<2	0.022	0.01	2	0.28	178	0.04	<1	<5	<5	<20		94	<10	<0.01	18	<20	
R 235	5	Elephant Nose, E of	R	<10	*	<5	0.22	<0.2	312	0.67	<2	<0.01	<0.01	<1	0.07	93	0.01	<1	<5	<5	<20		24	<10	<0.01	3	<20	
R 236	7	Elephant Nose, E of	SS	465	*	<5	0.79	0.3	18	4.6	<2	0.114	0.35	9	1.25	1542	0.11	6	<5	<5	<20		67	<10	0.14	74	<20	
R 237	6	Elephant Nose, E of	R	<10	*	<5	0.13	<0.2	363	0.46	<2	<0.01	<0.01	<1	<0.01	64	<0.01	<1	<5	<5	<20		16	<10	<0.01	<1	<20	
R 238	2618	Wedge Point	R	1440		<2	0.09	0.5	178	0.74	<10	0.01	0.21	<10	0.05	175	0.12		<2	<1			21		0.01	4	<10	
R 239	2619	Wedge Point	R	160		<2	1.02	0.5	80	4.72	<10	0.01	0.22	<10	1.17	1135	0.08		<2	1			34		0.13	44	<10	
R 240	478	Etolin Is, FS Rd 6544	R	181	*	<5	0.01	<0.2	156	0.89	2	0.054	0.08	18	0.02	31	0.05	<1	6	<5	<20		1	<10	<0.01	1	<20	
R 241	477	Etolin Is, FS Rd 6544	R	57	*	<5	2.46	<0.2	90	2.95	10	0.173	0.26	62	0.07	673	1.14	<1	21	<5	<20		28	<10	0.02	15	<20	
R 242	834	Quiet Harbor	R	216	*	<5	<0.01	<0.2	122	0.54	<2	<0.01	0.06	9	0.02	38	<0.01	<1	<5	<5	8	*	<1	<10	<0.01	3	8	*
R 243	731	Quiet Harbor	R	2677	*	<5	0.23	0.3	46	2.33	8	0.016	1.43	11	1.66	79	0.1	8	<5	9	5	*	24	<10	0.3	86	9	*
R 244	8712	Etolin Is, FS Rd 51009	R	618	*	<5	0.56	0.4	22	9.12	6	<0.01	0.6	14	0.34	760	0.06	<1	<5	17	<20		16	<10	0.13	117	<20	
R 245	460	Etolin Is, FS Rd 51009	R	791	*	<5	1.89	0.3	36	7.48	4	<0.01	0.3	17	0.24	744	0.1	<1	<5	5	<20		42	<10	0.17	59	<20	
R 246	8827	Etolin Island, FS Rd 6545	R	572	*	<5	0.13	4.7	187	1.28	4	<0.01	0.24	40	0.08	197	0.02	<1	<5	<5	<4	*	3	<10	<0.01	3	4	*
R 247	729	Kindergarten Bay	R	73	*	<5	0.04	0.7	63	1.08	<2	0.011	0.09	3	0.02	195	0.06	4	<5	<5	5	*	1	<10	0.03	2	11	*
R 248	832	Kindergarten Bay	R	1360	*	<5	0.03	<0.2	30	1.15	3	<0.01	0.11	6	0.05	128	0.07	<1	<5	<5	<4	*	3	<10	<0.01	3	10	*
R 249	831	Kindergarten Bay	S	301	*	<5	0.06	0.9	22	8.07	11		0.03	20	0.1	159	0.02	12	<5	<5	<20		9	<10	0.16	70	<20	
R 250	8713	Etolin Is, FS Rd 6540	R	220	*	<5	2.66	0.4	27	4.77	5	<0.01	0.04	2	1.7	523	0.27	<1	<5	<5	<20		185	<10	0.25	141	<20	
R 251	8714	Etolin Is, FS Rd 6540	R	102	*	<5	0.02	0.5	87	1.49	<2	<0.01	0.15	8	0.03	48	0.11	<1	<5	<5	<20		2	<10	<0.01	2	<20	
R 252	8730	Etolin Is, FS Rd 51540	R	13	*	<5	0.04	0.3	84	1.03	<2	<0.01	0.12	34	<0.01	63	0.05	<1	<5	<5	<20		2	<10	<0.01	2	<20	
R 253	8722	Etolin Is, FS Rd 51540	R	77	*	<5	0.58	1.9	177	2.7	<2	<0.01	0.02	<1	0.06	303	0.01	<1	<5	<5	<20		51	<10	0.02	9	<20	
R 254	461	Etolin Is, FS Rd 51581	R	102	*	<5	>10	0.6	61	1.06	4	<0.01	0.19	<1	0.51	1041	0.09	<1	<5	<5	<20		200	<10	0.07	30	<20	
R 255	8715	Etolin Is, FS Rd 6539	R	25	*	<5	<0.01	0.4	92	1.22	3	<0.01	0.11	31	<0.01	90	0.07	<1	<5	<5	<20		2	<10	<0.01	2	<20	
R 256	462	Etolin Is, FS Rd6547	R	90	*	<5	0.08	0.4	170	1.26	<2	<0.01	0.12	81	0.01	272	0.08	<1	<5	<5	<20		7	<10	<0.01	<1	<20	
R 257	3822	Wrangell Airport Quarry	R	1152		<5	0.90	<0.2	84	2.70	4	0.013	1.12	3	0.85	446	0.08	<1	<5	<5	322		49	<10	0.17	25	<20	
R 258	3821	Wrangell Airport Quarry	R	488		<5	0.10	<0.2	237	0.51	<2	<0.01	0.19	12	0.06	61	0.12	<1	<5	<5	44		16	<10	0.02	4	<20	
R 259	3823	Wrangell Airport Quarry	R	1012		<5	2.05	<0.2	107	2.70	6	<0.01	0.39	2	0.84	384	0.07	<1	<5	<5	120		56	<10	0.15	22	<20	
R 260	260	Pat Creek	R	2559	*	<5	0.25	<0.2	73	2.27	<2	<0.01	0.61	6	0.6	515	0.08	3	<5	<5	<20		17	<10	0.18	41	<20	
R 261	94	Pat Creek	SS	229		<5	0.33	<0.2	101	4.65	5	0.027	0.58	9	1.45	2958	0.09	3	<5	7	<20		29	<10	0.14	86	<20	
R 262	83	Wrangell Is, FS Rd 50050	R	165	*	<5	3.93	0.2	111	4.64	9	<0.01	0.49	3	0.84	530	0.4	10	<5	6	<20		312	<10	0.05	59	<20	
R 263	246	Wrangell Is, FS Rd 50050	R	225	*	<5	8.85	0.3	36	3.49	<2	<0.01	0.33	2	0.7	1197	0.2	7	<5	<5	<20		264	<10	0.04	43	<20	
R 264	74	Wrangell Is, FS Rd 6265	R	187	*	<5	0.83	0.3	222	1.28	<2	<0.01	0.27	2	0.6	147	0.09	2	<5	<5	<20		55	<10	0.06	36	<20	
R 265	75	Wrangell Is, FS Rd 6265	R	1079	*	<5	0.19	0.3	259	4.44	<2	<0.01	1.55	5	2.09	243	0.07	5	<5	12	<20		8	<10	0.19	114	<20	
R 266	242	Wrangell Is, FS Rd 6265	R	439	*	<5	1.62	0.2	114	2.14	3	0.01	0.63	3	0.96	132	0.09	3	<5	7	<20		60	<10	0.08	63	<20	
R 267	245	Wrangell Is, FS Rd 6265	R	923	*	<5	0.4	<0.2	76	3.79	<2	<0.01	0.58	5	0.97	277	0.1	3	<5	6	<20		16	<10	0.13	75	<20	
R 268	82	Wrangell Is, FS Rd 6265	R	537	*	<5	0.99	<0.2	179	3.48	<2	<0.01	0.38	2	0.64	268	0.1	<1	<5	<5	<20		97	<10	0.14	52	<20	
R 269	81	Wrangell Is, FS Rd 6265	R	647	*	<5	1.64	<0.2	177	2.78	<2	<0.01	0.59	2	0.96	240	0.12	5	<5	6	<20		69	<10	0.12	63	<20	
R 270	789	Jerry	R	258	*	<5	0.03	<0.2	150	0.22	<2	0.015	0.05	1	0.02	20	0.02	<1	<5	<5	<4	*	8	<10	<0.01	4	8	*
R 271	873	Jerry	SS	898	*	<5	0.23	<0.2	95	1.49	3	0.066	0.04	3	0.8	361	0.01	4	<5	<5	<20		13	<10	0.15	39	<20	
R 272	790	Jerry	R	78	*	<5	0.59	<0.2	131	0.32	<2	<0.01	0.01	<1	0.09	352	<0.01	<1	<5	<5	<4	*	79	<10	<0.01	5	8	*
R 273	874	Jerry	SS	1070	*	<5	0.27	0.4	105	5.23	3	0.094	0.05	3	1.17	1594	0.01	8	<5	<5	<20		21	<10	0.16	89	<20	
R 274	875	Jerry	R	149	*	<5	0.03	<0.2	252	0.32	<2	0.021	0.02	<1	0.02	39	0.01	<1	<5	<5	<4	*	2	<10	<0.01	6	9	*
R 275	791	Jerry	R	195	*	<5	2.77	0.3	112	2.45	3	0.027	0.38	4	2.22	480	0.07	11	<5	6	<4	*	164	<10	0.1	110	9	*
R 276	778	N of Libby Creek	R	1997	*	<5	1.52	0.6	71	4.57	<2	0.046	0.31	12	0.96	563	0.02	<1	<5	<5	<4	*	93	<10	0.05	8	19	*

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 277	861	N of Libby Creek	R	Rep	1.5	OC	Fest qz	<5	0.2	3	<2	11	5	4	1	0.16	<5
R 278	881	Hobart Bay Roads	R	G	0.5	RC	Granite w/ py dissem & on fractures	22	0.2	9	<2	55	2	69	9	0.42	84
R 279	2785	Hobart Bay Roads	R	G		RC	Granite w/ py dissem & on fractures	268	<0.1	<1	7	9	2	4	1	0.11	194
R 280	775	CB 1 & 2	R	C	0.8	OC	Qz vn w/ po, py	<5	<0.1	3	<2	2	<1	10	4	0.04	<5
R 281	3688	K&D area	R	G		FL	Fg sulf in leucocratic intrusive	7	1.3	41	177	125	7	5	4	2.05	12
R 282	3689	K&D area	R	G		FL	Sc w/ qz, cc, po	182	3.4	45	47	143	4	112	25	0.6	846
R 283	777	Hobart Bay Roads	SS					<5	0.2	29	3	88	2	18	12	1.15	<5
R 284	2786	Hobart Bay Roads	R	C	1	OC	Qz vn	<5	0.2	29	<2	193	7	35	6	1.42	<5
R 285	860	CB 1 & 2	SS					<5	0.2	40	<2	77	2	20	12	1.12	<5
R 286	776	Hobart Bay Roads	R	S		OC	Qz lenses w/ po	<5	<0.1	17	3	24	7	9	6	0.46	<5
R 287	876	Boone	SS					<5	0.2	45	3	147	3	41	18	1.59	6
R 288	2789	Hobart Bay Roads	R	G	0.5	RC	Fest granite w/ dissem py	<5	0.2	2	37	14	4	5	1	0.15	<5
R 289	884	Hobart Bay Roads	R	C	0.4	OC	Felsic dikes in diorite	<5	0.2	19	<2	25	4	12	33	0.44	<5
R 290	2788	Hobart Bay Roads	R	G	0.2	RC	Po in fest sc	<5	2	358	9	56	3	626	158	1.08	<5
R 291	883	Hobart Bay Roads	R	C		OC	Gossany sc w/ fest & minor sulf	<5	0.8	111	26	32	3	111	22	0.71	<5
R 292	2787	Hobart Bay Roads	R	G	0.2	OC	Fest phy w/ po	8	1.1	185	13	721	65	170	48	0.25	<5
R 293	882	Hobart Bay Roads	R	G	0.4	OC	Vuggy fest qz	<5	<0.1	16	<2	52	9	9	3	0.37	<5
R 294	2790	Hobart Bay Roads	R	G	0.1	RC	Qz bands w/ sparse blebs of sl, py	<5	7	5	908	319	2	5	<1	0.08	<5
R 295	2792	Hobart Bay Roads	R	C	1.2	OC	Qz vn w/ blebs of po, py	<5	<0.1	45	5	49	2	16	7	0.19	<5
R 296	2793	Hobart Bay Roads	R	G		RC	Qz vn w/ blebs of po, py	32	0.2	25	5	2100	8	6	7	0.1	133
R 297	885	Hobart Bay Roads	R	C	6	OC	Qz vn	<5	0.2	6	<2	9	8	8	1	0.04	<5
R 298	2791	Hobart Bay Roads	R	C	6.1	OC	Milky-white qz vn	<5	<0.1	2	13	3	6	6	<1	<0.01	<5
R 299	886	Hobart Bay Roads	R	Rep		OC	Qz vn	<5	0.3	8	31	27	2	8	1	0.05	<5
R 300	887	Hobart Bay Roads	R	Rep	1	OC	Qz vn in phy	<5	<0.1	6	4	127	4	6	2	0.47	7
R 301	888	Hobart Bay Roads	R	Rep		OC	Qz vn in sc	<5	<0.1	3	<2	<1	7	6	1	0.02	<5
R 302	2794	Hobart Bay Roads	R	G	0.4	RC	Qz vn hosted in granite	33	0.4	40	5	424	<1	28	13	0.04	70
R 303	2795	Hobart Bay Roads	R	G		RC	Qz vn w/ py, po	6	0.2	22	5	52	8	15	6	0.52	8
R 304	792	Hobart Bay Roads	R	RC		OC	Fest slate w/ qz stringers	<5	<0.1	167	<2	32	2	44	18	1.64	<5
R 305	878	Hobart Bay Roads	R	G	0.2	OC	Fest qz stringer in phy	<5	<0.1	3	<2	9	6	11	3	0.41	<5
R 306	880	Hobart Bay Roads	R	G		RC	Qz lenses in phy	<5	<0.1	6	<2	31	10	10	3	0.37	<5
R 307	2784	Hobart Bay Roads	R	G		RC	Fest qz w/ py	11	0.3	61	3	351	11	38	9	0.53	<5
R 308	794	Hobart Bay Roads	R	C	1.2	OC	Qz vn in fest sc & phy	<5	<0.1	9	<2	6	<1	13	4	0.43	<5
R 309	879	Hobart Bay Roads	R	G	0.5	OC	Fest qz stringer in phy	17	<0.1	20	<2	81	3	37	12	2.5	<5
R 310	793	Hobart Bay Roads	R	G	0.4	RC	Qz vn	<5	<0.1	35	<2	5	2	10	4	0.39	<5
R 311	877	Hobart Bay Roads	R	S	0.1	RC	Fest qz stringer in phy	<5	<0.1	43	<2	32	3	32	13	1.93	8
R 312	889	Hobart Bay Roads	R	Rep	3	OC	Qz vn	<5	<0.1	29	<2	30	4	20	5	0.41	<5
R 313	871	Hobart Bay Roads	R	S	0.5	OC	Qz	<5	<0.1	3	8	26	10	9	1	0.19	<5
R 314	787	Hobart Bay Roads	R	Rep		RC	Black, gp slate	<5	0.7	80	<2	274	8	30	8	1.21	<5
R 315	788	Hobart Bay Roads	R	G	0.4	RC	Sil granite	<5	<0.1	5	4	13	3	3	1	0.47	<5
R 316	872	Hobart Bay Roads	R	S	0.1	OC	Qz vn in granite	<5	0.4	3	86	65	17	6	<1	0.09	<5
R 317	2796	Hobart Bay Roads	R	C	0.5	OC	Fest qz	<5	0.2	22	6	542	8	28	4	0.36	<5
R 318	2797	Hobart Bay Roads	R	RC	3	OC	Fest sc	<5	0.2	44	5	119	7	13	7	1.04	<5
R 319	890	Hobart Bay Roads	R	S		OC	Qz vein w/ sl	<5	0.2	30	<2	8779	7	9	4	0.03	<5
R 320	768	Hobart Bay Roads	R	Rep		RC	Fest qz vn w/ po	<5	0.3	22	<2	<1	<1	9	3	0.01	<5
R 321	786	Hobart Bay Roads	R	G	0.5	RC	Black, gp, fest slate/phy	<5	0.6	71	<2	55	12	28	5	0.14	<5
R 322	870	Hobart Bay Roads	R	Rep		OC	Qz stringers w/ po	<5	<0.1	41	3	81	6	33	10	0.49	<5

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 277	861	N of Libby Creek	R	520	*	<5	0.34	<0.2	130	0.79	<2	0.017	0.1	3	0.03	167	0.02	<1	<5	<5	<4	*	21	<10	<0.01	1	10	*
R 278	881	Hobart Bay Roads	R	1780	*	<5	1.84	0.3	155	0.92	<2	0.035	0.24	<1	0.44	329	0.04	<1	30	<5	<4	*	106	<10	<0.01	6	10	*
R 279	2785	Hobart Bay Roads	R	270	*	<5	0.05	0.2	79	0.63	<2	0.025	0.04	<1	0.01	8	0.07	<1	<5	<5	<4	*	7	<10	<0.01	2	9	*
R 280	775	CB 1 & 2	R	79	*	<5	0.10	0.5	153	0.33	<2	0.02	0.02	<1	0.01	59	<0.01	<1	<5	<5	<4	*	8	<10	<0.01	<1		*
R 281	3688	K&D area	R	895	*	<5	0.69	0.8	90	1.21	2	0.068	0.16	2	0.1	101	1.22	<1	<5	<5	<4	*	57	<10	0.02	31	<4	*
R 282	3689	K&D area	R	1017	*	<5	>10	2.9	103	3.1	<2	0.22	0.19	3	0.69	1494	<0.01	<1	63	7	<4	*	762	<10	<0.01	26	6	*
R 283	777	Hobart Bay Roads	SS	1160	*	<5	0.3	0.5	29	3.04	<2	<0.01	0.02	6	0.92	422	<0.01	2	<5	<5	<20		16	<10	0.04	31	<20	
R 284	2786	Hobart Bay Roads	R	91	*	<5	<0.01	0.3	344	3.9	2	0.043	<0.01	1	1.74	250	<0.01	14	<5	<5	<4	*	<1	<10	<0.01	159	8	*
R 285	860	CB 1 & 2	SS	1120	*	<5	0.29	0.5	25	3.02	<2	0.07	0.02	6	0.92	384	<0.01	2	<5	<5	<20		15	<10	0.04	30		
R 286	776	Hobart Bay Roads	R	349	*	<5	2.57	0.6	129	1.81	<2	0.028	0.09	4	0.23	492	0.03	<1	<5	<5	<4	*	82	<10	0.01	7	9	*
R 287	876	Boone	SS	1363	*	<5	0.32	0.9	69	4.08	<2	0.053	0.04	7	1.42	619	0.02	4	<5	<5	<20		22	<10	0.06	52	<20	
R 288	2789	Hobart Bay Roads	R	955	*	<5	0.93	<0.2	133	0.48	<2	0.012	0.08	1	0.01	132	0.06	<1	<5	<5	<4	*	404	<10	<0.01	4	9	*
R 289	884	Hobart Bay Roads	R	210	*	<5	1.36	0.2	71	6.91	<2	0.035	0.18	5	0.26	204	0.08	27	<5	<5	7	*	83	<10	0.55	48	10	*
R 290	2788	Hobart Bay Roads	R	719	*	<5	0.75	0.7	284	>10	<2	0.07	0.35	3	1.61	238	0.03	2	<5	<5	<4	*	9	<10	0.48	73	5	*
R 291	883	Hobart Bay Roads	R	1013	*	<5	0.55	0.3	212	5.07	<2	0.025	0.07	2	0.98	203	0.03	5	<5	<5	<4	*	8	<10	0.41	50	8	*
R 292	2787	Hobart Bay Roads	R	1502	*	<5	2.54	7.6	47	>10	<2	0.061	0.13	7	0.09	579	0.02	4	<5	<5	<4	*	69	<10	0.39	28	10	*
R 293	882	Hobart Bay Roads	R	90	*	<5	0.03	<0.2	275	1.3	<2	0.014	0.02	<1	0.33	192	0.01	2	<5	<5	<4	*	<1	<10	0.02	31	9	*
R 294	2790	Hobart Bay Roads	R	354	*	13	0.4	5.1	201	0.36	<2	0.032	0.06	<1	<0.01	72	<0.01	<1	<5	<5	<4	*	46	<10	<0.01	2	7	*
R 295	2792	Hobart Bay Roads	R	93	*	<5	2.45	0.9	135	2.19	<2	0.028	0.07	1	0.16	462	0.07	2	<5	<5	<4	*	118	<10	0.09	17	7	*
R 296	2793	Hobart Bay Roads	R	386	*	<5	>10	23.2	90	4.95	<2	0.15	0.07	2	5.96	4170	0.01	<1	<5	<5	<4	*	782	<10	<0.01	6	12	*
R 297	885	Hobart Bay Roads	R	48	*	<5	0.03	<0.2	304	0.47	<2	0.014	0.01	<1	0.03	25	<0.01	<1	<5	<5	<4	*	2	<10	0.02	9	8	*
R 298	2791	Hobart Bay Roads	R	11	*	<5	<0.01	0.5	230	0.31	<2	0.011	<0.01	<1	<0.01	12	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	5	8	*
R 299	886	Hobart Bay Roads	R	205	*	<5	<0.01	<0.2	253	1.02	<2	0.015	0.03	<1	<0.01	21	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	2	9	*
R 300	887	Hobart Bay Roads	R	267	*	<5	2.7	0.3	133	3.23	3	0.029	0.43	43	1.02	1219	0.01	1	<5	<5	<4	*	137	<10	0.03	<1	12	*
R 301	888	Hobart Bay Roads	R	32	*	<5	0.04	<0.2	249	0.33	<2	0.012	<0.01	<1	0.01	22	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	5	8	*
R 302	2794	Hobart Bay Roads	R	76	*	<5	0.42	12.8	131	2.4	<2	0.027	0.02	<1	0.01	108	0.01	<1	<5	<5	<4	*	62	<10	<0.01	<1	8	*
R 303	2795	Hobart Bay Roads	R	1108	*	<5	0.1	<0.2	190	1.81	<2	0.023	0.1	5	0.28	76	0.03	<1	<5	<5	<4	*	9	<10	<0.01	16	9	*
R 304	792	Hobart Bay Roads	R	57	*	<5	2.45	<0.2	98	2.85	<2	0.041	0.01	<1	1.6	498	0.09	2	<5	<5	<4	*	8	<10	0.22	38	9	*
R 305	878	Hobart Bay Roads	R	332	*	<5	0.07	<0.2	220	0.7	<2	0.018	0.04	3	0.36	40	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	16	8	*
R 306	880	Hobart Bay Roads	R	963	*	<5	2.89	0.4	220	0.91	<2	0.022	0.13	1	0.33	447	<0.01	2	<5	<5	4	*	88	<10	0.03	24	8	*
R 307	2784	Hobart Bay Roads	R	2171	*	<5	0.93	4.7	189	2.64	<2	0.041	0.13	13	0.57	173	0.03	6	<5	<5	<4	*	21	<10	0.07	55	8	*
R 308	794	Hobart Bay Roads	R	24	*	<5	0.16	<0.2	162	0.63	<2	<0.01	<0.01	<1	0.33	77	<0.01	<1	<5	<5	<4	*	2	<10	0.02	9	8	*
R 309	879	Hobart Bay Roads	R	113	*	<5	1.28	0.6	266	3.24	<2	0.028	0.02	1	2.55	399	<0.01	4	<5	7	<4	*	8	<10	<0.01	60	9	*
R 310	793	Hobart Bay Roads	R	60	*	<5	0.19	<0.2	124	0.78	<2	0.017	<0.01	<1	0.32	154	0.05	<1	<5	<5	<4	*	2	<10	0.04	14	7	*
R 311	877	Hobart Bay Roads	R	21	*	<5	1.69	<0.2	240	2.89	<2	0.038	0.01	1	1.81	359	0.05	3	<5	<5	4	*	26	<10	0.1	44	8	*
R 312	889	Hobart Bay Roads	R	42	*	<5	0.08	<0.2	266	1.31	<2	0.019	0.08	3	0.24	71	0.02	2	<5	<5	<4	*	3	<10	0.01	31	9	*
R 313	871	Hobart Bay Roads	R	57	*	<5	>10	0.7	152	0.68	<2	0.016	<0.01	<1	0.34	1924	<0.01	<1	<5	<5	<4	*	580	<10	<0.01	8	9	*
R 314	787	Hobart Bay Roads	R	3299	*	<5	0.33	2.7	59	3.34	<2	0.032	0.25	6	1.06	227	0.02	3	<5	<5	<4	*	17	<10	0.16	42	10	*
R 315	788	Hobart Bay Roads	R	755	*	<5	2.8	0.2	38	0.72	<2	0.105	0.09	1	0.08	395	<0.01	<1	<5	<5	<4	*	256	<10	<0.01	5	8	*
R 316	872	Hobart Bay Roads	R	322	*	<5	1.11	1.2	230	0.33	<2	0.019	0.06	3	0.01	174	<0.01	<1	<5	<5	<4	*	134	<10	<0.01	4	8	*
R 317	2796	Hobart Bay Roads	R	1638	*	<5	0.93	6.9	118	1.06	<2	0.019	0.09	3	0.19	191	0.02	4	<5	<5	<4	*	40	<10	0.03	40	8	*
R 318	2797	Hobart Bay Roads	R	3167	*	<5	0.75	0.4	72	2.89	<2	0.023	0.2	7	0.61	249	0.03	1	<5	<5	<4	*	72	<10	0.05	20	9	*
R 319	890	Hobart Bay Roads	R	88	*	<5	<0.01	108.1	229	1.15	<2	0.264	0.02	<1	<0.01	23	<0.01	<1	6	<5	<4	*	2	<10	<0.01	5	<4	*
R 320	768	Hobart Bay Roads	R	33	*	<5	<0.01	<0.2	128	0.93	<2	0.013	<0.01	<1	<0.01	12	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	<1	7	*
R 321	786	Hobart Bay Roads	R	909	*	<5	0.33	2.1	71	0.96	<2	0.039	0.08	3	0.03	12	0.03	5	<5	<5	<4	*	7	<10	0.21	37	8	*
R 322	870	Hobart Bay Roads	R	452	*	<5	4.57	0.5	176	2.2	<2	0.025	0.04	1	0.47	769	0.01	1	<5	<5	<4	*	241	<10	0.06	22	8	*

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 323	785	Hobart Bay Roads	R	Rep		RC	Qz in fest phy/sc	<5	<0.1	21	3	88	6	17	6	0.71	<5
R 324	783	Hobart Bay Roads	R	C	1.4	OC	Qz vn	7	<0.1	11	13	27	7	41	5	0.58	<5
R 325	784	Hobart Bay Roads	R	C	1	OC	Qz vn	<5	<0.1	3	<2	23	7	34	4	0.15	<5
R 326	863	Hobart Bay Roads	R	S		OC	Qz vn in hbl diorite	<5	<0.1	45	5	30	5	9	7	0.8	<5
R 327	780	Hobart Bay Roads	R	Rep	5	OC	Granodiorite near contact with fest sc/phy	<5	0.2	225	<2	113	10	42	17	1.72	<5
R 328	781	Hobart Bay Roads	R	G	0.4	RC	Fest ar w/ py & gray sulf	15	2.5	153	22	267	7	42	15	0.19	<5
R 329	864	Hobart Bay Roads	R	C	0.8	OC	Fest qz at sc-diorite contact	<5	<0.1	38	<2	77	2	27	15	1.91	<5
R 330	866	Hobart Bay Roads	R	Rep		OC	Qz vn	<5	<0.1	3	<2	<1	<1	6	1	0.06	<5
R 331	868	Hobart Bay Roads	R	S	0.8	OC	Fest qz	<5	<0.1	39	<2	7	2	21	8	0.1	<5
R 332	867	Hobart Bay Roads	R	C	3	OC	Fest qz vn	<5	<0.1	16	<2	5	6	12	5	0.04	<5
R 333	869	Hobart Bay Roads	R	Rep		OC	Fest qz	<5	<0.1	15	<2	9	9	9	2	0.07	<5
R 334	865	Hobart Bay Roads	R	G		RC	Fest qz chl sc	<5	1.4	126	<2	293	8	42	42	3.11	<5
R 335	782	Hobart Bay Roads	R	G	1	RC	Qz w/ py	<5	<0.1	3	<2	9	5	4	<1	0.11	<5
R 336	779	Hobart Bay Roads	R	Rep	6	OC	Ar & sc	<5	0.3	147	4	52	9	123	18	1.09	<5
R 337	862	Hobart Bay Roads	R	S		OC	Qz stringer w/ po in sc	<5	<0.1	44	4	25	5	37	9	0.62	<5
R 338	2807	Glory Lake	SS					71	0.5	48	11	83	3	33	10	1.47	13
R 339	390	Glory Lake	SS					<5	<0.1	21	5	44	<1	7	7	1.08	<5
R 340	2808	Glory Lake	SS					<5	0.2	21	9	44	<1	6	6	0.95	<5
R 341	2855	Buck Bar area	PC					234	<0.2	30	5	92	<1	6	18	0.07	<5
R 342	2854	Buck Bar area	PC					64	<0.2	31	5	91	<1	6	16	0.05	<5
R 343	1008	N of Horseshoe Basin	R	CC	3	OC	Qz vn	<5	<0.1	5	<2	12	2	3	<1	0.26	<5
R 344	1007	N of Horseshoe Basin	R	CC	4	OC	Qz vn	<5	<0.1	8	<2	5	3	3	<1	0.28	<5
R 345	1006	N of Horseshoe Basin	R	CC	2.4	OC	Qz vn	<5	0.4	13	3	20	4	4	1	0.51	<5
R 346	1005	N of Horseshoe Basin	R	CC	0.6	OC	Qz vn	<5	<0.1	6	10	82	1	4	3	1.29	<5
R 347	1004	N of Horseshoe Basin	R	G		OC	Qz vn	<5	0.2	17	4	18	3	12	4	0.5	8
R 348	1003	N of Horseshoe Basin	R	G	0.4	OC	Fest sil gneiss	11	0.4	89	13	54	5	46	18	3.44	<5
R 349	655	Horseshoe Basin	SS					10	0.2	40	43	264	6	27	17	3.12	<5
R 350	653	Horseshoe Basin	R	G		FL	Qz	12	0.3	17	35	93	6	12	3	0.55	11
R 351	654	Horseshoe Basin	R	G	0.3	FL	Sil gneiss w/ 10% py	<5	<0.1	46	13	114	2	6	17	2.01	<5
R 352	652	Horseshoe Basin	SS					<5	0.2	32	24	137	4	15	14	2.57	8
R 353	8872	Horseshoe Basin	SS					<5	0.3	30	28	108	2	14	16	2.3	10
R 354	9601	Porterfield Creek, @ head	R	Rep	0.5	FL	Garnet gneiss w/ dissem sulf	<5	0.2	97	13	31	2	64	22	4.82	<5
R 355	142	Porterfield Creek, @ head	R	G	0.1	FL	Qz boulder w/ po, cp	<5	4.5	2372	19	334	2	23	37	0.05	<5
R 356	8822	North Silver area	R	C	2	OC	Rhyolite	<5	2.4	31	435	398	6	19	8	2.88	<5
R 357	8823	North Silver area	R	S		OC	Rhyolite w/ sl	<5	9	99	637	6864	9	17	11	2.88	<5
R 358	2637	Camp 6. west of	R	G	1	OC	Fel dike w/ fest sulf clots	<5	25	470	50	149	6	3	7	1.41	14
R 359	594	Virgina Lake, inlet	SS					<5	0.2	44	59	222	6	18	13	2.34	13
R 360	95	Huff prospect area	R	G		OC	Fest qz vn w/ sparse po	<5	0.2	28	28	38	<1	5	4	0.47	<5
R 361	3749	Upper Marten Lake area	R	Rep	0.7	OC	Fest qz vn in sc	517	1.2	26	3	5	9	14	<1	0.09	<5
R 362	3744	White River	R	G		RC	Asbestiform minerals	<5	<0.1	16	<2	23	2	1402	64	0.25	<5
R 363	3743	White River, NE of	R	S		RC	Quartzite w/ py, minor cp	<5	0.4	458	<2	10	33	35	19	0.41	<5
R 364	2843	White River, NE of	R	Rep		RC	Fest metaseds w/ fg sulf	12	1.5	1151	7	86	7	59	37	5.21	<5
R 365	3742	White River, NE of	R	G		OC	Gneiss pendant in intrusive	13	1.1	137	<2	166	48	35	4	0.68	<5
R 366	2842	Craig River area	R	Rep		RC	Fest metased	<5	0.5	88	<2	34	5	10	12	2.31	14
R 367	582	N Fork Bradfield River	SS					14	<0.1	10	40	88	4	9	7	1	<5
R 368	3745	N Fork Bradfield River	R	G		OC	Gneiss w/ minor sulf in shear zone	<5	0.7	384	5	94	67	102	27	2.02	<5

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 323	785	Hobart Bay Roads	R	388	*	<5	4.95	0.8	93	2	<2	0.023	0.09	2	0.66	672	0.03	3	<5	<5	<4	*	261	<10	0.14	35	8	*
R 324	783	Hobart Bay Roads	R	335	*	<5	>10	1.2	82	1.37	<2	0.021	0.19	2	0.85	2054	<0.01	2	<5	<5	<4	*	1791	<10	0.03	26	8	*
R 325	784	Hobart Bay Roads	R	236	*	<5	3.63	0.4	118	1.11	<2	0.049	0.02	2	1.07	553	0.05	2	<5	<5	<4	*	235	<10	<0.01	27	9	*
R 326	863	Hobart Bay Roads	R	161	*	<5	6.03	0.5	35	1.92	2	0.019	0.05	2	0.59	478	0.1	4	<5	<5	<4	*	499	<10	0.13	38	8	*
R 327	780	Hobart Bay Roads	R	267	*	<5	0.43	0.4	107	4.36	4	0.042	0.09	6	1.35	255	0.07	16	<5	6	<4	*	14	<10	0.25	164	10	*
R 328	781	Hobart Bay Roads	R	213	*	<5	0.32	13.6	93	9.49	<2	1.263	0.03	7	0.06	61	0.05	1	<5	<5	<4	*	32	<10	<0.01	44	9	*
R 329	864	Hobart Bay Roads	R	77	*	<5	0.32	0.4	124	3.51	5	0.028	0.01	5	1.53	378	0.07	8	<5	<5	<4	*	12	<10	0.18	91	7	*
R 330	866	Hobart Bay Roads	R	16	*	<5	0.01	<0.2	186	0.36	<2	0.016	<0.01	<1	0.04	30	<0.01	<1	<5	<5	<4	*	<1	<10	<0.01	6	7	*
R 331	868	Hobart Bay Roads	R	33	*	<5	0.2	<0.2	235	1.28	<2	0.023	0.02	<1	0.03	21	<0.01	<1	<5	<5	<4	*	24	<10	<0.01	5	8	*
R 332	867	Hobart Bay Roads	R	23	*	<5	0.09	<0.2	232	0.61	<2	0.018	<0.01	<1	0.01	20	<0.01	<1	<5	<5	<4	*	7	<10	<0.01	6	8	*
R 333	869	Hobart Bay Roads	R	36	*	<5	0.03	<0.2	280	0.61	<2	0.016	<0.01	<1	0.05	57	<0.01	<1	<5	<5	6	*	2	<10	<0.01	10	8	*
R 334	865	Hobart Bay Roads	R	2023	*	<5	0.53	0.7	60	>10	4	0.034	0.53	3	2.51	472	0.03	17	<5	6	<4	*	13	<10	0.45	185	10	*
R 335	782	Hobart Bay Roads	R	33	*	<5	0.69	0.2	140	0.45	<2	0.013	<0.01	<1	0.09	54	<0.01	<1	<5	<5	<4	*	45	<10	0.04	9	8	*
R 336	779	Hobart Bay Roads	R	601	*	<5	3.68	0.8	187	4.34	2	0.017	0.23	6	1.37	698	0.05	6	<5	<5	5	*	252	<10	0.18	74	9	*
R 337	862	Hobart Bay Roads	R	828	*	<5	4.68	0.6	140	1.88	<2	0.013	0.13	1	0.78	728	0.02	2	<5	<5	<4	*	359	<10	0.06	29	9	*
R 338	2807	Glory Lake	SS	1254	*	<5	1.10	0.6	16	2.98	4	0.02	0.23	8	0.50	150	0.08	3	<5	<5	<4	*	45	<10	0.07	40	26	*
R 339	390	Glory Lake	SS	1374	*	<5	0.66	<0.2	18	1.77	3	0.014	0.42	10	0.56	221	0.05	5	<5	<5	<4	*	31	<10	0.13	52	<4	*
R 340	2808	Glory Lake	SS	1439	*	<5	0.8	<0.2	15	2.01	3	0.012	0.32	15	0.44	189	0.05	5	<5	<5	<4		33	<10	0.1	57	<4	*
R 341	2855	Buck Bar area	PC	52	*	<5	0.44	<0.2	52	>10	3	0.013	<0.01	30	0.03	875	<0.01	<1	<5	<5	<20		9	<10	0.12	788	<20	
R 342	2854	Buck Bar area	PC	25	*	<5	0.35	<0.2	43	>10	<2	0.056	<0.01	22	0.02	843	<0.01	<1	<5	<5	<20		6	<10	0.09	771	<20	
R 343	1008	N of Horseshoe Basin	R	4550	*	<5	0.04	<0.2	144	0.33	<2	0.01	0.11	1	0.07	38	0.06	<1	<5	<5	<4	*	8	<10	0.02	4	7	*
R 344	1007	N of Horseshoe Basin	R	1219	*	<5	0.03	<0.2	118	0.34	<2	<0.01	0.06	<1	0.04	20	0.08	<1	<5	<5	<4	*	12	<10	<0.01	5	6	*
R 345	1006	N of Horseshoe Basin	R	874	*	<5	0.31	<0.2	121	1.47	<2	0.016	0.07	3	0.14	39	0.13	<1	<5	<5	5	*	22	<10	0.03	12	8	*
R 346	1005	N of Horseshoe Basin	R	4869	*	<5	0.55	<0.2	49	1.71	2	<0.01	0.27	2	0.56	287	0.1	4	<5	<5	<4	*	26	<10	0.16	47	7	*
R 347	1004	N of Horseshoe Basin	R	255	*	<5	5.08	<0.2	118	0.99	<2	<0.01	0.15	8	0.29	492	0.01	<1	<5	<5	<4	*	105	<10	<0.01	14	17	*
R 348	1003	N of Horseshoe Basin	R	639	*	<5	3.62	<0.2	59	3.91	7	<0.01	0.17	11	0.68	273	0.39	2	<5	<5	<4	*	240	<10	0.15	38	9	*
R 349	655	Horseshoe Basin	SS	1228	*	<5	1.11	1.1	335	5.02	5	0.01	0.69	8	1.67	838	0.28	7	<5	12	<4	*	49	<10	0.25	106	<4	*
R 350	653	Horseshoe Basin	R	333	*	<5	0.51	0.6	189	1.11	<2	<0.01	0.13	1	0.22	205	0.06	<1	<5	<5	<4	*	10	<10	0.03	13	<4	*
R 351	654	Horseshoe Basin	R	9697	*	<5	1.11	<0.2	74	5.38	3	<0.01	1.23	2	1.72	546	0.1	7	<5	14	8	*	17	<10	0.25	99	<4	*
R 352	652	Horseshoe Basin	SS	1416	*	<5	0.8	0.5	187	4.47	4	0.011	0.8	8	1.41	746	0.15	6	<5	9	<4	*	31	<10	0.2	85	<4	*
R 353	8872	Horseshoe Basin	SS	1308	*	<5	0.55	0.4	27	4.42	4	0.016	0.61	5	1.39	712	0.05	6	<5	8	<4	*	23	<10	0.2	89	<4	*
R 354	9601	Porterfield Creek, @ head	R	504	*	<5	4.22	<0.2	67	1.7	3	<0.01	0.03	<1	0.45	225	0.39	3	<5	<5	<4	*	122	<10	0.12	36	<20	
R 355	142	Porterfield Creek, @ head	R	258	*	<5	0.03	3	251	6.31	<2	<0.01	0.02	<1	0.04	40	<0.01	<1	<5	<5	<4	*	2	<10	<0.01	<1	<20	
R 356	8822	North Silver area	R	734	*	<5	3.73	1.9	60	4.87	10	<0.01	0.16	10	2.2	3402	0.02	4	<5	<5	30	*	69	<10	0.09	54	12	*
R 357	8823	North Silver area	R	38	*	14	3.04	57.3	130	7.6	11	0.013	0.01	7	2.33	3508	<0.01	3	<5	<5	42	*	37	<10	0.1	69	<4	*
R 358	2637	Camp 6. west of	R	20		364	0.03	<.5	100	3.87	10	0.02	0.16	<10	0.31	290	0.07		<2	<1			3		<.01	13	<10	
R 359	594	Virgina Lake, inlet	SS	1063	*	<5	0.9	0.7	131	3.68	3	0.025	0.32	8	1.22	521	0.11	7	<5	6	13	*	30	<10	0.16	81	11	*
R 360	95	Huff prospect area	R	100	*	<5	0.08	0.2	131	1.22	<2	<0.01	0.08	<1	0.24	103	0.05	<1	<5	<5	<4	*	5	<10	0.03	26	<20	
R 361	3749	Upper Marten Lake area	R	<10	*	69	0.02	<0.2	262	0.76	<2	0.29	0.01	<1	0.08	43	<0.01	<1	<5	<5	<4	*	<1	20	<0.01	6	<4	*
R 362	3744	White River	R	<10	*	<5	0.04	<0.2	265	3.51	<2	<0.01	0.08	<1	10	478	<0.01	4	<5	<5	<4	*	<1	<10	<0.01	5	<4	*
R 363	3743	White River, NE of	R	151	*	<5	0.2	0.2	299	1.36	<2	<0.01	0.03	2	0.01	34	0.1	<1	<5	<5	8	*	35	<10	<0.01	3	8	*
R 364	2843	White River, NE of	R	333	*	<5	3.86	1.1	116	4.57	12	<0.01	0.27	11	0.53	179	0.19	<1	<5	<5	<20		209	12	0.11	29	<20	
R 365	3742	White River, NE of	R	847	*	<5	0.21	1.7	213	2.59	2	0.011	0.36	10	0.43	152	0.08	<1	<5	<5	<4	*	19	<10	0.09	86	<4	*
R 366	2842	Craig River area	R	779	*	<5	1.18	<0.2	85	5.22	4	<0.01	0.09	4	0.9	307	0.17	<1	<5	8	<20		101	<10	0.14	163	<20	
R 367	582	N Fork Bradfield River	SS	1917	*	<5	0.69	<0.2	148	8.73	3	0.015	0.1	24	0.34	626	0.1	15	<5	<5	<4	*	75	<10	0.15	157	<4	*
R 368	3745	N Fork Bradfield River	R	1413	*	<5	1.2	0.6	241	4.12	5	<0.01	0.4	3	1.12	160	0.09	<1	<5	5	12	*	52	<10	0.13	157	12	*

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Method	Size (ft)	Site	Description	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Al %	As ppm
R 369	8868	Mt Lewis Cass	R	S		OC	Granite w/ mo stringer	<5	1.4	9	66	50	###	4	3	0.56	14
R 370	8805	Gorge (P. Pieper)	R	S		OC	Marble	<5	<0.1	9	16	22	1	4	2	0.45	<5
R 371	8806	Gorge (P. Pieper)	R	S		OC	Marble	<5	<0.1	5	7	52	4	7	3	0.13	<5
R 372	3933	Gorge (P. Peiper)	R	SC	4.5@.5	OC	Qz-ser sc w/ py	15	0.6	170	6	68	10	10	12	0.95	<5
R 373	3934	Gorge (P. Peiper)	R	Rep		OC	Sc, gneiss w/ dissem py, po	23	0.8	167	13	1621	9	14	20	2.42	<5
R 374	3935	Gorge (P. Peiper)	R	G		MD	Marble	<5	<0.1	7	4	37	5	4	1	0.64	<5
R 375	72	Duck Point, W of	R	C	0.25	OC	Fest qz vn w/ bt & po	<5	<0.1	33	9	18	<1	4	<1	0.38	<5
R 376	240	Duck Point	R	Rep	0.83	OC	Qz vn in metased	<5	<0.1	15	9	18	<1	1	<1	0.24	<5

Table B-2. Analytical results for reconnaissance investigations samples

Map no.	Sample no.	Location	Type	Ba ppm	* xrf	Bi ppm	Ca %	Cd ppm	Cr ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm	Na %	Nb ppm	Sb ppm	Sc ppm	Sn ppm	* xrf	Sr ppm	Te ppm	Ti %	V ppm	W ppm	* xrf
R 369	8868	Mt Lewis Cass	R	3160	*	<5	0.39	0.2	128	1.2	<2	<0.01	0.2	16	0.2	488	0.13	2	<5	<5	<4	*	122	<10	0.06	17	<4	*
R 370	8805	Gorge (P. Pieper)	R	1190	*	<5	0.22	<0.2	111	0.60	<2	<0.01	0.26	2	0.11	118	0.09	<1	<5	<5	<20		14	<10	0.02	5	<20	
R 371	8806	Gorge (P. Pieper)	R	<10	*	<5	>10	0.9	10	0.30	<2	<0.01	0.04	5	8.70	714	<0.01	<1	<5	<5	<20		85	<10	<0.01	6	<20	
R 372	3933	Gorge (P. Peiper)	R	2608	*	<5	0.15	0.4	95	5.15	4	<0.01	0.37	4	0.56	175	0.03	<1	<5	<5	<20		19	<10	0.03	22	<20	
R 373	3934	Gorge (P. Peiper)	R	1104	*	<5	0.99	10.5	101	7.69	5	0.07	0.60	1	1.13	663	0.16	7	<5	11	<20		32	<10	0.12	115	<20	
R 374	3935	Gorge (P. Peiper)	R	31	*	<5	>10	0.6	24	0.35	<2	0.01	0.24	6	2.96	193	<0.01	<1	<5	<5	<20		61	<10	0.01	11	<20	
R 375	72	Duck Point, W of	R	1274	*	<5	0.1	<0.2	97	0.6	<2	<0.01	0.15	2	0.1	47	0.09	<1	<5	<5	<20		13	<10	0.03	4	<20	
R 376	240	Duck Point	R	2038	*	<5	0.05	<0.2	39	0.57	<2	<0.01	0.09	<1	0.08	51	0.04	2	<5	<5	<20		8	<10	0.02	4	<20	

Table B-3. Analytical results for samples analyzed for rare earth elements

Table B-3. Analytical results for samples analyzed for rare-earth elements

Map No.	Sample No.	Location	Sample Description	Sample Type	Sample Size (ft)	Sample Site	Sample Description	Ce ppm	Eu ppm	La ppm	Lu ppm	Nd ppm	Sc ppm	Sm ppm	Tb ppm	Th ppm	U ppm	Yb ppm
12.1	174	Kadake Bay	R	C	0.1	OC	Carbonaceous fossils in shale	41	1.3	23	0.4	22	19.4	3.8	<1	6.6	46	3
12.1	175	Kadake Bay	R	C	0.3	OC	Carbonaceous bed in ls	12	0.6	7	<0.2	<10	2.1	1.6	<1	<0.5	8	1
17.2	9628	Point Saint Albans	R	C	0.5	OC	Gw w/ py band at margins of dike	27	<0.5	15	0.3	10	5.4	2.4	<1	4.9	<1	2
17.3	178	Point Saint Albans	R	G	0.3	OC	Qz lens w/ py	21	0.7	11	0.2	12	5.6	2.1	<1	2.1	4	1
17.3	179	Point Saint Albans	R	C	0.1	OC	Qz lens w/ blebs of sl	38	1.0	20	<0.2	17	2.7	3.0	<1	0.6	<1	<1
17.3	180	Point Saint Albans	R	C	0.4	OC	Qz vn w/ aspy, py, sl, gn	13	1.2	11	<0.2	<10	6.3	0.9	<1	<0.5	<5	<1
17.3	9629	Point Saint Albans	R	C	2.4	OC	Fault zone in gw w/ qz & sulf	14	0.8	7	<0.2	<10	3.7	1.8	<1	1.3	<1	<1
17.3	9630	Point Saint Albans	R	C	1.1	OC	Fest shear zone w/ qz & sulf	19	0.8	12	<0.2	10	10.0	2.0	<1	1.5	<1	<1
17.3	9631	Point Saint Albans	R	S	0.4	OC	Sheared gw br w/ gn	14	0.8	14	<0.2	<10	6.2	1.1	<1	1.2	<1	<1
17.5	177	Point Saint Albans	R	Rep	1.5	OC	Fest qz-cc zone w/ py, fg sl	12	0.7	6	<0.2	<10	5.9	1.9	<1	1.3	<1	1
43.1	181	Monongehela	R	C	3	OC	Fest volc	110	0.9	38	1.0	43	1.3	8.6	1	17.0	7	7
69.2	9654	Zarembo Island Fluorite	R	C	0.4	OC	Vuggy, crystalline qz br in andesite	24	<0.5	11	0.2	10	0.6	2.1	<1	1.8	1	1
69.3	296	Zarembo Island Fluorite	R	Rep	8	OC	Fest, banded andesite w/ py	65	<0.5	35	0.4	25	1.6	4.2	<1	20.0	9	3
113.4	575	Cone Mountain	R	RC		OC	Fest qz rhyolite w/ sparse clusters of po	170	<0.5	77	2.6	68	0.5	22.6	5	28.0	19	19
114.2	624	Black Crag	R	G	0.3	FL	Qz-eye rhyolite w/ mo	49	0.6	23	1.6	22	1.0	7.7	2	20.0	8	12
114.2	625	Black Crag	R	G		FL	Mo fracture coating in volc rocks	203	0.5	87	1.3	67	1.3	14.4	3	26.0	9	10
114.2	649	Black Crag	R	G	0.5	FL	Sil fel volc w/ 20% py	3	<0.5	2	0.7	<10	0.3	2.1	<1	41.0	10	5
114.2	650	Black Crag	R	G	0.5	RC	Granite w/ small vugs & qz crystals	200	1.0	85	3.2	82	0.2	24.3	5	63.5	30	23
114.2	651	Black Crag	R	G		FL	Fest sil rhyolite br w/ fg sulf	69	0.7	31	1.8	32	5.1	10.4	3	17.0	11	13
114.2	8860	Black Crag	R	G		RC	Silica-rich volc or metamorphic rock	230	0.7	109	0.9	84	1.1	17.8	3	31.0	5	7
114.2	8861	Black Crag	R	G		RC	Silica-rich volc or metamorphic rock	1740	<1.2	954	2.0	440	3.2	60.0	5	72.6	16	14
114.2	8871	Black Crag	R	G		FL	Hbl rhyolite br	221	0.7	92	2.3	93	0.3	24.1	4	52.0	26	17
113.1	621	Cone Mountain	R	G	0.4	FL	Granite	140	<0.5	75	1.5	48	0.5	10.7	2	46.0	15	11
113.2	623	Cone Mountain	R	G		OC	Granite	110	<0.5	60	1.6	33	1.0	7.7	2	66.9	18	11
113.3	622	Cone Mountain	R	G		RC	Granite w/ small vugs & qz crystals	140	<0.5	67	0.9	39	0.5	7.6	1	61.6	15	6
R220	297	Zarembo Is, FS Rd 6585	R	S		RC	Fest andesite w/ blebs & banded fg py	39	1.7	18	0.6	24	26.5	5.3	1	4.1	2	4

Table B-4. Latitude and longitude coordinates for sample locations

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
1.1	9604	56.90776	-134.29524
1.1	9605	56.90776	-134.29524
1.1	9606	56.90776	-134.29524
2.1	9622	56.92679	-134.19743
2.1	9623	56.92290	-134.19430
2.2	167	56.92144	-134.19294
2.3	155	56.92032	-134.18650
2.3	156	56.92037	-134.18580
2.3	9612	56.91940	-134.18470
2.4	9611	56.91877	-134.17948
3.1	161	56.92770	-134.13280
3.1	9617	56.92770	-134.13280
3.1	9618	56.92770	-134.13280
3.1	9619	56.92770	-134.13280
3.1	9620	56.92770	-134.13280
3.1	9621	56.92790	-134.13350
3.2	2614	56.92339	-134.12001
3.3	162	56.92175	-134.11648
3.3	163	56.92175	-134.11648
3.3	164	56.92175	-134.11648
3.3	165	56.92175	-134.11648
3.3	166	56.92175	-134.11648
4.1	151	56.88980	-134.16044
4.1	152	56.89100	-134.16080
4.1	153	56.89100	-134.16080
5.1	159	56.90570	-134.12960
5.1	160	56.90554	-134.13172
6.1	9578	56.89780	-134.10530
6.1	9615	56.89780	-134.10530
6.1	9616	56.89992	-134.10657
7.1	9613	56.90320	-134.08940
7.2	157	56.90185	-134.07839
7.2	9614	56.90170	-134.07860
8.1	9577	56.89171	-134.07913
8.2	154	56.88937	-134.07218
8.2	158	56.88928	-134.07265
9.1	9608	56.88110	-134.07400
9.1	9609	56.88097	-134.07355
9.1	9610	56.88290	-134.07240
10.1	3874	56.87912	-134.03943
10.2	3873	56.87735	-134.03924
10.3	3872	56.87691	-134.03943
10.4	3878	56.87566	-134.03854
10.5	3879	56.87236	-134.03784
10.6	3880	56.87232	-134.03788
10.7	8768	56.87228	-134.03808
10.8	3881	56.87227	-134.03812
10.9	8769	56.87227	-134.03813
10.10	3882	56.87216	-134.03820
10.11	3883	56.87214	-134.03823
10.12	8773	56.87211	-134.03826

Map No.	Sample No.	Latitude	Longitude
10.13	8774	56.87208	-134.03829
10.14	8770	56.87200	-134.03840
10.15	8771	56.87200	-134.03840
10.16	8772	56.87198	-134.03836
10.17	8778	56.87175	-134.03849
10.18	8780	56.87175	-134.03848
10.19	8777	56.87174	-134.03847
10.20	8779	56.87174	-134.03847
10.21	3888	56.87158	-134.03850
10.22	3890	56.87157	-134.03851
10.23	3889	56.87157	-134.03852
10.24	3893	56.87153	-134.03899
10.25	3891	56.87152	-134.03897
10.26	3892	56.87152	-134.03892
10.27	8781	56.87146	-134.03872
11.1	148	56.87456	-134.22328
11.1	9607	56.87460	-134.22220
12.1	174	56.80576	-133.95034
12.1	175	56.80576	-133.95034
12.1	176	56.80576	-133.95034
12.1	9627	56.80640	-133.94840
13.1	9625	56.79941	-133.94377
13.1	9626	56.80061	-133.94421
13.2	168	56.79687	-133.94314
13.2	169	56.79687	-133.94314
13.2	170	56.79687	-133.94314
13.2	171	56.79640	-133.94258
13.2	9624	56.79824	-133.94347
13.3	172	56.79595	-133.94189
13.3	173	56.79527	-133.94106
14.1	3837	56.31330	-134.19849
14.2	3838	56.31029	-134.20539
14.2	8754	56.31029	-134.20539
14.2	8755	56.31029	-134.20539
14.2	8756	56.31029	-134.20539
14.3	3839	56.30220	-134.20638
14.3	3840	56.30220	-134.20638
14.4	3841	56.29644	-134.20700
14.4	3842	56.29644	-134.20700
14.4	8757	56.29644	-134.20700
14.5	3843	56.29454	-134.20685
14.5	3844	56.29299	-134.20726
14.6	3845	56.25542	-134.17992
14.6	3846	56.25434	-134.18051
14.7	3848	56.25153	-134.21482
14.8	3847	56.24002	-134.20446
15.1	3849	56.13531	-134.25129
15.1	8758	56.13439	-134.25223
15.2	3850	56.13362	-134.25324
15.2	3851	56.13349	-134.25515
16.1	3870	56.11109	-134.17969

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
16.2	3869	56.11109	-134.17969
16.3	3867	56.11108	-134.17973
16.4	3868	56.11108	-134.17969
16.5	3871	56.11106	-134.17969
17.1	8767	56.11045	-133.95607
17.2	9628	56.10881	-133.95770
17.3	178	56.10448	-133.95833
17.3	179	56.10448	-133.95833
17.3	180	56.10448	-133.95833
17.3	3859	56.10613	-133.95902
17.3	3862	56.10503	-133.95879
17.3	3863	56.10503	-133.95879
17.3	3864	56.10503	-133.95879
17.3	9629	56.10448	-133.95833
17.3	9630	56.10448	-133.95833
17.3	9631	56.10448	-133.95833
17.4	3860	56.10451	-133.96269
17.5	177	56.10249	-133.95813
17.5	3861	56.10267	-133.95832
17.5	8766	56.10272	-133.95997
18.1	3853	55.91501	-134.32777
18.1	3854	55.91564	-134.32945
18.1	3855	55.91564	-134.32945
18.1	3856	55.91564	-134.32945
18.1	8760	55.91564	-134.32945
18.2	3852	55.91319	-134.32813
18.2	8759	55.91319	-134.32813
19.1	3857	55.91833	-134.29586
19.2	8764	55.91831	-134.29578
19.3	8762	55.91830	-134.29577
19.4	8765	55.91829	-134.29580
19.5	8763	55.91828	-134.29583
19.6	8761	55.91828	-134.29581
19.7	3858	55.91826	-134.29585
20.1	2363	57.09841	-133.88199
20.1	2364	57.09845	-133.88199
20.1	2391	57.09845	-133.88199
20.1	3928	57.09812	-133.88388
20.1	8804	57.09812	-133.88388
21.1	3710	57.05130	-133.82970
21.1	3711	57.05130	-133.82970
21.2	3705	57.03830	-133.89230
21.2	8671	57.03830	-133.89230
21.3	3700	56.98840	-133.95910
22.1	3730	56.99430	-133.87250
22.1	8689	56.99690	-133.87140
22.2	3729	56.99931	-133.86327
22.2	8688	56.99878	-133.86328
22.3	3728	57.00390	-133.85700
23.1	3894	56.85977	-133.56305
23.1	3895	56.85977	-133.56305
23.1	8782	56.85977	-133.56305
23.1	8783	56.85904	-133.56378
23.2	3896	56.86319	-133.54274
23.2	3897	56.86319	-133.54274
23.2	8775	56.86305	-133.54273
23.2	8776	56.86305	-133.54273
23.2	8784	56.86319	-133.54274
23.2	8785	56.86319	-133.54274
23.2	8786	56.86319	-133.54274
23.3	3886	56.85802	-133.53897
23.3	3887	56.85802	-133.53897
23.4	3885	56.85978	-133.53349
23.5	3898	56.85252	-133.56355
23.6	1594	56.84960	-133.55792
23.6	1595	56.84930	-133.55777
23.6	1596	56.84715	-133.55419
23.7	1592	56.84237	-133.55090
23.7	1593	56.84397	-133.55223
23.7	6425	56.84235	-133.55113
23.8	1584	56.84083	-133.56331
23.9	1583	56.83805	-133.55981
23.9	1585	56.83657	-133.56093
23.9	6417	56.83648	-133.55962
23.10	1580	56.83306	-133.55819
23.10	1581	56.83271	-133.55873
23.10	1582	56.83382	-133.55877
23.11	3905	56.83594	-133.60288
23.11	3906	56.83594	-133.60288
23.11	8791	56.83594	-133.60288
23.11	8792	56.83552	-133.60259
23.12	3900	56.83254	-133.58794
23.12	3901	56.83254	-133.58794
23.12	8787	56.83254	-133.58794
23.13	1586	56.82839	-133.55624
23.14	1562	56.82868	-133.52931
23.14	1563	56.82886	-133.53110
23.14	6408	56.82992	-133.53131
23.14	6409	56.82989	-133.53123
23.15	6406	56.82112	-133.52680
23.15	6407	56.82119	-133.52691
23.16	6405	56.81265	-133.51832
23.17	3904	56.80615	-133.54320
23.17	8790	56.80615	-133.54320
23.18	3902	56.78999	-133.52995
23.18	3903	56.78999	-133.52995
23.18	8788	56.78999	-133.52995
23.18	8789	56.78999	-133.52995
24.1	111	56.85828	-133.40072
24.1	112	56.85828	-133.40072
24.1	113	56.85828	-133.40072
24.1	270	56.85828	-133.40072

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
24.1	271	56.85831	-133.40072
24.1	272	56.85831	-133.40072
24.2	2345	56.85536	-133.39640
24.2	2346	56.85409	-133.39440
24.2	2347	56.85409	-133.39440
24.2	9558	56.85536	-133.39640
24.2	9559	56.85400	-133.39518
25.1	2832	56.89195	-133.36433
25.1	2833	56.89195	-133.36433
25.2	415	56.89194	-133.36428
25.2	416	56.89194	-133.36428
25.2	417	56.89194	-133.36428
25.3	3723	56.88899	-133.36957
25.3	3724	56.88899	-133.36957
25.4	107	56.88899	-133.36952
25.4	108	56.88899	-133.36952
25.4	268	56.88899	-133.36952
25.5	8677	56.88895	-133.36958
25.6	8676	56.88892	-133.36958
25.7	8682	56.88886	-133.36956
25.8	8684	56.88887	-133.36951
25.9	8681	56.88885	-133.36954
25.10	8683	56.88884	-133.36953
25.11	3714	56.88882	-133.36951
25.12	3715	56.88883	-133.36947
25.13	3716	56.88882	-133.36944
25.14	3717	56.88881	-133.36943
25.15	267	56.88881	-133.36942
25.16	3725	56.88880	-133.36942
25.17	8685	56.88876	-133.36938
25.18	3726	56.88873	-133.36939
25.19	266	56.88871	-133.36936
25.20	413	56.88899	-133.36894
25.20	414	56.88899	-133.36894
25.21	2831	56.88884	-133.36893
25.22	8686	56.88900	-133.36855
25.23	104	56.88899	-133.36856
25.23	105	56.88899	-133.36856
25.24	106	56.88899	-133.36858
25.25	8687	56.88898	-133.36857
25.26	3727	56.88895	-133.36856
25.27	8657	56.88933	-133.36813
25.28	8658	56.88907	-133.36817
25.29	2809	56.88921	-133.36794
25.30	3667	56.88933	-133.36700
25.31	3677	56.88857	-133.36671
25.32	3684	56.88850	-133.36690
25.32	3685	56.88850	-133.36690
25.33	3686	56.88848	-133.36685
25.34	3687	56.88845	-133.36675
25.35	3806	56.88842	-133.36672

Map No.	Sample No.	Latitude	Longitude
25.35	3807	56.88842	-133.36672
25.36	8659	56.88841	-133.36667
25.37	3808	56.88838	-133.36659
25.38	3665	56.88831	-133.36679
25.38	3666	56.88831	-133.36679
25.39	3809	56.88834	-133.36650
25.40	3810	56.88830	-133.36645
25.40	3811	56.88830	-133.36645
25.40	3812	56.88830	-133.36645
25.41	3813	56.88825	-133.36637
25.42	3814	56.88818	-133.36625
25.43	3815	56.88804	-133.36602
25.44	8709	56.88799	-133.36597
25.44	8710	56.88799	-133.36598
26.1	6371	56.91741	-133.28133
26.2	2803	56.91449	-133.26865
26.2	2804	56.91449	-133.26865
26.2	2805	56.91449	-133.26865
26.2	2806	56.91449	-133.26865
26.2	3673	56.91449	-133.26865
26.2	3674	56.91449	-133.26865
26.2	3675	56.91449	-133.26865
26.2	3678	56.91449	-133.26865
26.2	3679	56.91449	-133.26865
26.2	3680	56.91449	-133.26865
26.2	3681	56.91449	-133.26865
26.2	3682	56.91449	-133.26865
26.2	6368	56.91450	-133.26787
26.2	6369	56.91447	-133.26784
27.1	3912	56.83218	-133.36093
27.1	3913	56.83218	-133.36093
27.2	3908	56.82552	-133.35429
27.2	3909	56.82682	-133.35490
27.2	3910	56.82682	-133.35490
27.2	3911	56.82801	-133.35573
27.2	8793	56.82682	-133.35490
27.2	8794	56.82682	-133.35490
27.2	8795	56.82682	-133.35490
27.2	8796	56.82801	-133.35573
28.1	109	56.84069	-133.32261
28.1	110	56.84069	-133.32261
28.1	269	56.84069	-133.32261
28.1	279	56.84080	-133.32260
28.1	280	56.84080	-133.32260
28.1	513	56.84025	-133.32144
28.2	114	56.83918	-133.30921
28.2	115	56.83918	-133.30921
28.2	273	56.83918	-133.30921
28.2	9647	56.84040	-133.31020
29.1	60	56.84899	-133.26177
29.1	61	56.84899	-133.26177

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
29.1	62	56.84899	-133.26177
29.1	136	56.84759	-133.26350
29.1	137	56.84759	-133.26350
29.1	138	56.85014	-133.25982
29.1	139	56.85014	-133.25982
29.1	140	56.85014	-133.25982
29.1	141	56.85014	-133.25982
29.1	232	56.84759	-133.26349
29.1	233	56.84759	-133.26349
29.1	2367	56.85014	-133.25982
29.1	2368	56.85014	-133.25982
29.1	2369	56.85014	-133.25982
29.1	9598	56.84761	-133.26294
29.1	9599	56.84899	-133.26177
29.1	9600	56.84879	-133.26123
30.1	915	56.79700	-133.38291
30.1	916	56.79730	-133.38279
30.1	917	56.79756	-133.38268
30.1	918	56.79854	-133.38514
30.1	6337	56.79684	-133.38281
30.2	912	56.79579	-133.38284
30.2	913	56.79610	-133.38286
30.2	914	56.79646	-133.38279
30.2	6333	56.79601	-133.38291
30.2	6334	56.79627	-133.38283
30.2	6335	56.79637	-133.38270
30.2	6336	56.79629	-133.38262
31.1	51	56.79322	-133.35883
31.1	52	56.79274	-133.35839
31.1	53	56.79520	-133.35792
31.1	54	56.79494	-133.35743
31.1	225	56.79322	-133.35883
31.1	226	56.79614	-133.35787
31.1	227	56.79614	-133.35787
32.1	548	56.99688	-133.16229
32.2	547	56.99164	-133.13541
32.3	550	56.97961	-133.11402
32.3	551	56.97961	-133.11402
32.3	552	56.97994	-133.11407
32.3	2865	56.97961	-133.11402
32.3	2866	56.97961	-133.11402
32.3	2867	56.97961	-133.11402
32.4	553	56.97494	-133.10705
32.5	546	56.99276	-133.07885
32.6	392	56.98457	-133.07015
32.6	393	56.98662	-133.07249
32.6	394	56.98662	-133.07249
32.6	395	56.98421	-133.07090
32.6	396	56.98421	-133.07085
32.6	397	56.97845	-133.06828
32.6	398	56.97845	-133.06828
32.6	545	56.98667	-133.07263
32.6	2810	56.98457	-133.07015
32.6	2811	56.98537	-133.07036
32.6	2812	56.98583	-133.07128
32.6	2813	56.98794	-133.07302
32.6	2814	56.98794	-133.07302
32.7	549	56.94645	-133.11044
33.1	50	56.74005	-133.24420
33.1	224	56.74009	-133.24427
34.1	47	56.67207	-133.25815
34.1	48	56.67207	-133.25815
34.1	222	56.67207	-133.25815
34.1	223	56.67207	-133.25815
34.1	2622	56.67206	-133.25814
34.1	9645	56.67212	-133.25816
35.1	278	56.66640	-133.25660
35.1	9646	56.66550	-133.25630
36.1	42	56.65252	-133.16481
36.1	43	56.65252	-133.16478
36.1	46	56.65215	-133.16745
36.1	218	56.65252	-133.16478
36.1	2621	56.65252	-133.16478
36.2	44	56.65016	-133.16321
36.2	45	56.64772	-133.16273
36.2	219	56.65016	-133.16321
36.2	220	56.64822	-133.16191
36.2	221	56.64772	-133.16273
37.1	808	56.66239	-133.09558
37.1	3920	56.66092	-133.09420
37.1	3921	56.66188	-133.09589
37.1	3938	56.66150	-133.09524
37.1	3939	56.66089	-133.09398
37.1	8801	56.66188	-133.09589
37.2	3940	56.65537	-133.08602
37.2	3941	56.65537	-133.08602
37.2	3942	56.65537	-133.08602
37.2	3943	56.65431	-133.08472
37.2	3944	56.65297	-133.08263
37.2	3945	56.65297	-133.08263
37.2	3946	56.65297	-133.08263
37.2	3948	56.65085	-133.08017
37.2	3949	56.65175	-133.08087
37.2	3950	56.65221	-133.08165
37.2	8808	56.65537	-133.08602
37.2	8809	56.65537	-133.08602
37.2	8810	56.65537	-133.08602
37.2	8811	56.65431	-133.08472
37.2	8812	56.65297	-133.08263
37.2	8813	56.65221	-133.08165
37.3	923	56.64815	-133.07179
37.3	3947	56.64792	-133.07626

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
37.3	6339	56.64815	-133.07179
37.3	6340	56.64815	-133.07179
37.3	6341	56.64746	-133.07361
37.4	708	56.64372	-133.07160
37.4	709	56.64301	-133.06967
37.4	710	56.64121	-133.06698
37.4	813	56.64222	-133.06899
37.4	3951	56.64383	-133.07168
37.5	894	56.66024	-133.06176
37.5	896	56.65957	-133.06471
37.5	6288	56.66053	-133.06320
37.6	898	56.65476	-133.05441
37.7	900	56.64915	-133.06720
37.7	6298	56.65074	-133.06062
37.7	6299	56.64982	-133.06408
37.7	6300	56.64931	-133.06621
37.7	6301	56.64931	-133.06621
37.7	6338	56.64931	-133.06621
38.1	2862	56.65763	-133.08488
38.1	3817	56.65763	-133.08481
38.1	3818	56.65763	-133.08481
39.1	351	56.67840	-133.05550
39.1	9683	56.67980	-133.05660
39.2	407	56.67497	-133.04303
39.2	408	56.67497	-133.04303
39.2	409	56.67497	-133.04303
39.2	410	56.67497	-133.04303
39.2	411	56.67497	-133.04303
39.2	412	56.67497	-133.04303
39.2	2823	56.67497	-133.04303
39.2	2824	56.67497	-133.04303
39.2	2825	56.67497	-133.04303
39.2	2826	56.67497	-133.04303
39.2	2827	56.67497	-133.04303
39.2	2828	56.67497	-133.04303
39.2	2829	56.67537	-133.04297
39.2	2830	56.67537	-133.04297
39.3	421	56.66395	-133.02890
39.3	2835	56.66398	-133.02895
40.1	465	56.64963	-133.02489
41.1	188	56.56530	-133.09930
41.1	189	56.56460	-133.09879
41.1	9634	56.56530	-133.09930
41.1	9635	56.56510	-133.09870
42.1	540	56.52452	-133.53999
42.2	541	56.53077	-133.50027
42.2	2626	56.53117	-133.50026
42.2	9725	56.53077	-133.50027
43.1	181	56.46824	-133.43476
43.1	185	56.46852	-133.43469
44.1	36	56.57133	-133.06710

Map No.	Sample No.	Latitude	Longitude
44.1	381	56.57134	-133.06711
44.2	9698	56.57128	-133.06624
44.3	2359	56.57046	-133.06710
44.4	37	56.57041	-133.06696
44.5	38	56.57037	-133.06695
44.6	9565	56.57035	-133.06704
44.7	9566	56.57034	-133.06700
44.8	39	56.57033	-133.06696
44.9	9700	56.57029	-133.06702
44.10	213	56.56988	-133.06668
44.10	214	56.56988	-133.06668
44.10	2624	56.56988	-133.06668
44.11	30	56.56987	-133.06667
44.11	31	56.56987	-133.06667
44.12	32	56.56947	-133.06694
44.12	215	56.56947	-133.06694
44.13	382	56.56947	-133.06691
44.13	383	56.56947	-133.06691
44.14	200	56.56946	-133.06688
44.15	9642	56.56921	-133.06725
44.16	2873	56.56875	-133.06567
44.17	2623	56.56866	-133.06762
44.18	216	56.56864	-133.06758
44.18	217	56.56864	-133.06758
44.19	34	56.56862	-133.06767
44.19	35	56.56862	-133.06767
44.20	33	56.56860	-133.06761
44.21	40	56.56824	-133.06773
44.22	41	56.56820	-133.06775
44.23	569	56.56789	-133.06484
44.23	570	56.56789	-133.06484
44.23	571	56.56789	-133.06484
44.24	281	56.56466	-133.06750
45.1	9569	56.56841	-133.06607
45.2	9643	56.56641	-133.06321
45.3	572	56.56634	-133.06296
45.3	2874	56.56634	-133.06296
45.4	573	56.56644	-133.06284
45.4	574	56.56644	-133.06284
45.4	9701	56.56644	-133.06284
45.5	274	56.56594	-133.06274
45.6	275	56.56516	-133.06166
45.6	276	56.56516	-133.06166
45.6	9568	56.56515	-133.06166
45.7	9591	56.56492	-133.06200
45.8	9644	56.56284	-133.05871
45.9	277	56.56284	-133.05870
45.10	9567	56.56203	-133.05750
46.1	685	56.57221	-133.05878
46.2	686	56.57220	-133.05878
46.3	687	56.57218	-133.05878

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
46.4	688	56.57217	-133.05878
46.5	689	56.57216	-133.05877
47.1	9641	56.57370	-133.05710
47.2	196	56.57346	-133.05733
47.2	197	56.57346	-133.05733
47.2	198	56.57346	-133.05733
47.2	199	56.57346	-133.05733
47.3	2627	56.57346	-133.05733
47.4	2628	56.57349	-133.05695
47.4	2629	56.57349	-133.05695
47.4	9639	56.57349	-133.05695
47.5	9697	56.57352	-133.05661
47.6	9640	56.57352	-133.05661
47.7	510	56.57353	-133.05640
47.8	511	56.57335	-133.05511
48.1	502	56.56560	-133.02961
48.2	2387	56.56561	-133.02952
48.3	2381	56.56556	-133.02952
48.3	2382	56.56556	-133.02952
48.3	2383	56.56556	-133.02952
48.4	505	56.56545	-133.02951
48.5	503	56.56564	-133.02912
48.5	724	56.56564	-133.02912
48.5	2386	56.56564	-133.02912
48.6	9575	56.56569	-133.02879
48.7	2384	56.56567	-133.02878
48.7	2385	56.56567	-133.02878
48.8	504	56.56552	-133.02888
48.8	2620	56.56552	-133.02888
48.9	8748	56.56570	-133.02797
48.9	8749	56.56570	-133.02797
48.10	506	56.56501	-133.03046
48.11	2388	56.56480	-133.03087
48.11	2389	56.56480	-133.03087
48.11	2390	56.56480	-133.03087
48.12	507	56.56478	-133.03086
48.12	508	56.56478	-133.03086
49.1	723	56.56461	-133.03025
49.2	827	56.56458	-133.02979
49.3	722	56.56491	-133.02928
49.4	720	56.56495	-133.02912
49.4	826	56.56495	-133.02912
49.5	721	56.56514	-133.02913
49.6	509	56.56548	-133.02803
49.6	8747	56.56548	-133.02803
49.7	825	56.56413	-133.02902
50.1	538	56.56287	-133.02743
50.1	539	56.56287	-133.02743
50.2	537	56.55986	-133.01999
50.3	9571	56.55840	-133.00995
50.4	384	56.55790	-133.00900
50.4	8650	56.55790	-133.00900
50.4	9699	56.55790	-133.00900
51.1	334	56.57320	-133.00550
51.2	325	56.57326	-133.00547
51.3	330	56.57327	-133.00549
51.4	331	56.57328	-133.00549
51.5	327	56.57329	-133.00547
51.6	328	56.57329	-133.00546
51.7	326	56.57328	-133.00546
51.7	329	56.57328	-133.00546
51.8	333	56.57330	-133.00544
51.9	332	56.57330	-133.00544
51.10	335	56.57337	-133.00524
51.11	336	56.57343	-133.00503
51.12	338	56.57344	-133.00497
51.13	337	56.57344	-133.00496
51.14	342	56.57346	-133.00494
51.15	339	56.57345	-133.00488
51.16	343	56.57346	-133.00481
51.17	340	56.57348	-133.00469
51.18	341	56.57349	-133.00469
51.19	9677	56.57349	-133.00467
51.20	9678	56.57350	-133.00465
51.21	9675	56.57351	-133.00460
51.22	9674	56.57350	-133.00459
51.23	9676	56.57350	-133.00458
51.24	9673	56.57351	-133.00457
51.25	9680	56.57352	-133.00449
51.26	9679	56.57353	-133.00446
51.27	9681	56.57354	-133.00421
51.28	9672	56.57357	-133.00404
51.29	9671	56.57357	-133.00404
52.1	839	56.57541	-133.00252
52.2	838	56.57533	-133.00239
52.3	837	56.57529	-133.00228
52.4	836	56.57521	-133.00220
52.5	835	56.57513	-133.00203
52.6	735	56.57500	-133.00248
52.7	734	56.57500	-133.00247
52.8	732	56.57494	-133.00256
52.8	733	56.57494	-133.00256
52.9	9682	56.57490	-133.00260
53.1	491	56.58151	-132.97594
53.2	489	56.58147	-132.97594
53.2	490	56.58147	-132.97594
54.1	492	56.57588	-132.98614
54.1	493	56.57588	-132.98614
54.1	494	56.57588	-132.98614
54.2	495	56.57607	-132.97995
54.2	496	56.57607	-132.97995
54.3	8740	56.57290	-132.97652

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
54.4	8741	56.57241	-132.97621
55.1	711	56.53392	-133.05622
55.2	9723	56.53314	-133.05331
55.3	211	56.53314	-133.05311
55.3	212	56.53314	-133.05311
55.3	536	56.53314	-133.05311
55.3	9724	56.53314	-133.05311
55.4	9718	56.53313	-133.05290
55.4	9719	56.53313	-133.05290
55.4	9720	56.53313	-133.05290
55.4	9721	56.53313	-133.05290
55.4	9722	56.53313	-133.05290
55.5	533	56.53313	-133.05276
55.5	535	56.53313	-133.05276
55.6	28	56.53313	-133.05263
55.6	29	56.53313	-133.05263
55.6	534	56.53313	-133.05263
56.1	518	56.53185	-133.04977
56.1	9714	56.53185	-133.04977
56.2	715	56.53193	-133.04909
56.3	818	56.53193	-133.04908
56.4	512	56.53251	-133.04872
56.5	8750	56.53249	-133.04846
56.6	27	56.53264	-133.04798
56.7	2636	56.53272	-133.04774
56.8	714	56.53285	-133.04777
56.9	9715	56.53299	-133.04764
56.10	713	56.53300	-133.04750
56.11	520	56.53302	-133.04741
56.12	712	56.53304	-133.04731
56.13	519	56.53278	-133.04732
56.14	6956	56.53272	-133.04734
56.15	2630	56.53277	-133.04722
56.16	2631	56.53279	-133.04719
56.17	2634	56.53280	-133.04715
56.18	2632	56.53283	-133.04710
56.19	2633	56.53284	-133.04707
56.20	6950	56.53267	-133.04717
56.21	6951	56.53270	-133.04702
56.22	6953	56.53290	-133.04675
56.23	6954	56.53287	-133.04672
56.24	6952	56.53283	-133.04672
56.25	6955	56.53298	-133.04657
56.26	2635	56.53411	-133.04515
57.1	499	56.54840	-133.04174
57.2	501	56.54786	-133.03874
57.3	500	56.54786	-133.03874
57.3	8743	56.54720	-133.03896
57.3	8744	56.54720	-133.03896
57.4	498	56.54670	-133.03883
57.4	8742	56.54670	-133.03883

Map No.	Sample No.	Latitude	Longitude
57.5	497	56.54513	-133.03816
58.1	9570	56.55032	-133.02684
58.1	9702	56.55032	-133.02684
58.2	350	56.54670	-133.02410
58.3	349	56.54700	-133.02390
58.4	344	56.54740	-133.02330
58.4	345	56.54740	-133.02330
58.4	346	56.54740	-133.02330
58.4	347	56.54740	-133.02330
58.5	348	56.54720	-133.02260
59.1	9638	56.51950	-133.02060
59.2	195	56.52000	-133.01780
59.3	193	56.52030	-133.01650
59.3	194	56.52030	-133.01650
59.3	9636	56.52030	-133.01650
59.3	9637	56.52030	-133.01650
59.4	192	56.52040	-133.01600
59.5	190	56.52070	-133.01510
59.5	191	56.52070	-133.01510
60.1	691	56.52402	-132.99545
60.1	692	56.52402	-132.99545
60.2	690	56.52423	-132.99405
60.3	800	56.52364	-132.99513
60.4	693	56.52299	-132.99401
60.5	681	56.52215	-132.99545
60.5	683	56.52215	-132.99545
60.5	762	56.52215	-132.99545
60.6	658	56.52175	-132.99533
60.7	671	56.52129	-132.99641
60.8	670	56.52129	-132.99621
60.9	669	56.52129	-132.99602
60.10	694	56.52127	-132.99588
60.11	667	56.52128	-132.99578
60.11	668	56.52128	-132.99578
60.12	666	56.52128	-132.99559
60.13	659	56.52127	-132.99537
60.13	660	56.52127	-132.99537
60.13	682	56.52127	-132.99537
60.13	695	56.52127	-132.99537
60.13	696	56.52127	-132.99537
60.13	697	56.52127	-132.99537
60.13	801	56.52127	-132.99537
60.13	802	56.52127	-132.99537
60.13	854	56.52127	-132.99537
60.14	675	56.52130	-132.99512
60.14	676	56.52130	-132.99512
60.15	677	56.52129	-132.99480
60.16	678	56.52129	-132.99453
60.16	679	56.52129	-132.99453
60.17	680	56.52137	-132.99413
60.18	661	56.52117	-132.99536

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
60.18	662	56.52117	-132.99536
60.18	672	56.52117	-132.99536
60.18	673	56.52117	-132.99536
60.18	674	56.52117	-132.99536
60.19	663	56.52091	-132.99526
60.19	664	56.52091	-132.99526
60.19	698	56.52091	-132.99526
60.19	763	56.52091	-132.99526
60.19	803	56.52091	-132.99526
60.20	665	56.52060	-132.99523
60.21	699	56.52055	-132.99521
60.21	804	56.52055	-132.99521
60.22	855	56.52024	-132.99510
60.23	700	56.52008	-132.99526
60.24	805	56.52010	-132.99508
60.25	764	56.51976	-132.99539
60.26	765	56.51929	-132.99560
60.27	767	56.51465	-133.00959
60.28	766	56.51358	-133.00045
60.29	856	56.51239	-132.99698
60.30	857	56.51476	-132.98137
61.1	399	56.71966	-132.77985
61.1	400	56.71966	-132.77985
61.1	2815	56.71966	-132.77985
61.1	2816	56.71966	-132.77985
61.1	2817	56.71966	-132.77985
61.1	2818	56.71966	-132.77985
62.1	401	56.66753	-132.71085
62.1	402	56.66753	-132.71085
62.1	2819	56.66753	-132.71085
62.1	2820	56.66729	-132.71104
63.1	3914	56.54852	-132.95872
63.1	3915	56.54852	-132.95872
63.1	3916	56.54852	-132.95872
63.1	8797	56.54852	-132.95872
63.1	8798	56.54852	-132.95872
63.1	8799	56.54852	-132.95872
64.1	391	56.55290	-132.75220
65.1	291	56.42415	-132.98573
65.1	9651	56.42400	-132.98410
66.1	307	56.41916	-132.95289
66.1	308	56.41916	-132.95289
66.2	2617	56.41912	-132.95145
66.3	18	56.41911	-132.95143
66.4	9660	56.41910	-132.95139
66.4	9661	56.41910	-132.95139
66.4	9662	56.41910	-132.95139
66.5	2616	56.41907	-132.95092
66.6	17	56.41906	-132.95086
66.7	303	56.41907	-132.95082
66.7	304	56.41907	-132.95082

Map No.	Sample No.	Latitude	Longitude
66.7	305	56.41907	-132.95082
66.7	306	56.41907	-132.95082
66.8	207	56.41907	-132.95078
67.1	15	56.38097	-132.90010
67.1	16	56.38097	-132.90010
67.1	314	56.38180	-132.89840
67.1	315	56.38180	-132.89840
67.1	316	56.38180	-132.89840
67.1	317	56.38180	-132.89840
67.1	318	56.38180	-132.89840
67.1	319	56.38180	-132.89840
67.1	320	56.38180	-132.89840
67.1	321	56.38180	-132.89840
67.1	322	56.38180	-132.89840
67.1	2625	56.38097	-132.90010
67.1	9658	56.38180	-132.89840
67.1	9667	56.38170	-132.89800
67.1	9668	56.38180	-132.89840
67.1	9669	56.38170	-132.89800
68.1	298	56.41440	-132.63610
68.1	299	56.41480	-132.63150
68.1	300	56.41480	-132.63150
68.1	301	56.41527	-132.63179
68.1	309	56.41527	-132.63179
68.1	310	56.41527	-132.63179
68.1	311	56.41716	-132.62687
68.1	312	56.41480	-132.62758
68.1	313	56.41320	-132.62843
68.1	9656	56.41510	-132.63750
68.1	9657	56.41440	-132.63200
68.1	9663	56.41440	-132.63200
68.1	9664	56.41930	-132.63000
68.1	9665	56.41950	-132.63150
68.1	9666	56.41810	-132.62790
69.1	295	56.29930	-132.96200
69.2	9654	56.29570	-132.95820
69.3	296	56.29270	-132.95570
69.4	19	56.27085	-132.93262
69.4	20	56.27085	-132.93262
69.4	21	56.27047	-132.93124
69.4	22	56.27085	-132.93262
69.4	23	56.27047	-132.93124
69.4	208	56.27085	-132.93262
69.4	209	56.27085	-132.93262
70.1	293	56.29120	-132.80690
71.1	354	56.28080	-132.70350
71.1	355	56.28080	-132.70350
71.1	356	56.28080	-132.70350
71.1	357	56.28080	-132.70350
71.1	358	56.28080	-132.70350
71.1	359	56.28080	-132.70350

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
71.1	360	56.28080	-132.70350
71.1	9686	56.28110	-132.70410
71.1	9687	56.28110	-132.70410
72.1	3936	56.23854	-132.98340
72.1	3937	56.23854	-132.98340
72.1	8807	56.23854	-132.98347
73.1	8	56.42127	-132.53300
73.1	9	56.42127	-132.53300
73.1	10	56.42127	-132.53300
73.1	11	56.42127	-132.53300
73.1	12	56.42127	-132.53300
73.1	13	56.42127	-132.53300
73.1	14	56.42127	-132.53300
73.1	204	56.42127	-132.53300
73.1	205	56.42127	-132.53300
73.1	206	56.42127	-132.53300
74.1	63	56.41867	-132.52966
74.1	64	56.41867	-132.52966
74.1	65	56.41867	-132.52966
75.1	730	56.15954	-132.64435
75.2	993	56.15389	-132.63055
76.1	999	56.14523	-132.58227
76.1	8994	56.14477	-132.58547
76.1	8995	56.14477	-132.58547
76.1	9745	56.14540	-132.58223
77.1	467	56.13704	-132.65636
77.1	8719	56.13577	-132.65982
78.1	596	56.34541	-132.34728
78.1	8839	56.34541	-132.34728
79.1	76	56.30634	-132.22497
79.1	77	56.30634	-132.22497
79.1	78	56.30634	-132.22497
79.1	79	56.30634	-132.22497
79.1	80	56.30634	-132.22497
79.1	243	56.30634	-132.22497
79.1	244	56.30634	-132.22497
80.1	468	56.10670	-132.07660
80.1	469	56.10590	-132.07740
80.1	8720	56.10620	-132.07750
80.1	8721	56.10590	-132.07740
81.1	8716	56.05220	-132.09920
82.1	772	57.48046	-133.47700
82.1	8665	57.48045	-133.47700
82.2	8664	57.48049	-133.47701
82.3	771	57.48057	-133.47696
82.4	769	57.48067	-133.47670
82.5	8661	57.48066	-133.47670
82.6	8663	57.48067	-133.47669
82.7	8660	57.48066	-133.47668
82.8	8662	57.48066	-133.4767
82.9	3693	57.48073	-133.4765
82.9	3694	57.48073	-133.4765
82.10	3691	57.48075	-133.4765
82.11	3692	57.48075	-133.4765
82.12	770	57.48075	-133.4765
82.13	3690	57.48075	-133.4765
82.14	3695	57.4804	-133.4759
82.15	859	57.48124	-133.4754
82.16	774	57.48142	-133.4751
82.17	858	57.48162	-133.4742
82.18	773	57.4822	-133.4727
83.1	6411	57.3268	-133.0851
83.2	974	57.32681	-133.0849
83.3	6412	57.32674	-133.085
83.4	973	57.32646	-133.0849
84.1	389	57.3316	-132.9129
84.1	543	57.3307	-132.9097
84.1	544	57.33165	-132.9116
84.1	2863	57.3307	-132.9097
84.1	2864	57.33193	-132.9125
84.1	8656	57.3316	-132.9129
85.1	385	57.2672	-133.5125
85.1	386	57.2672	-133.5125
85.1	387	57.267	-133.5121
85.1	388	57.2672	-133.5125
85.1	8652	57.2676	-133.5119
85.1	8653	57.2676	-133.5119
85.1	8654	57.2676	-133.5119
85.1	8655	57.2676	-133.5119
86.1	6403	57.11343	-133.32221
86.1	6404	57.11345	-133.32220
86.2	6402	57.11574	-133.27367
86.3	6400	57.11807	-133.27081
86.3	6401	57.11808	-133.27082
86.3	8936	57.11978	-133.26895
86.3	8937	57.11956	-133.26982
86.3	8938	57.11833	-133.27067
86.3	8939	57.11833	-133.27100
86.4	6399	57.12492	-133.26635
87.1	567	57.10356	-132.80068
87.1	568	57.10397	-132.80120
87.1	2872	57.10422	-132.80215
88.1	2800	56.99184	-132.78901
88.1	2801	56.99184	-132.78901
88.1	2802	56.99184	-132.78901
88.1	3668	56.99184	-132.78901
88.1	3669	56.99184	-132.78901
88.1	3670	56.99184	-132.78901
88.1	3671	56.99184	-132.78901
88.1	3672	56.99184	-132.78901
89.1	554	56.83180	-132.44558
89.1	555	56.83180	-132.44558

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
89.1	556	56.83180	-132.44558
89.1	557	56.83180	-132.44558
89.1	558	56.83180	-132.44558
89.1	559	56.83180	-132.44558
89.1	560	56.83180	-132.44558
89.1	561	56.83180	-132.44558
89.1	562	56.83180	-132.44558
89.1	563	56.83226	-132.44561
89.1	564	56.83226	-132.44561
89.1	565	56.83742	-132.44628
89.1	566	56.83742	-132.44628
89.1	2868	56.8318	-132.4456
89.1	2869	56.8318	-132.4456
89.1	2870	56.83145	-132.4454
89.1	2871	56.83145	-132.4454
90.1	84	56.66673	-132.2391
90.1	85	56.66668	-132.2397
90.1	247	56.66687	-132.2386
90.1	248	56.6671	-132.238
91.1	2856	56.71415	-132.1031
91.1	2857	56.7135	-132.1066
91.1	2858	56.7135	-132.1066
91.2	86	56.71818	-132.0699
91.2	87	56.71806	-132.0702
91.2	249	56.7183	-132.0696
91.2	250	56.71852	-132.0693
91.3	88	56.70549	-132.0605
91.3	89	56.70519	-132.0583
91.3	251	56.70592	-132.0639
91.3	252	56.70572	-132.0619
91.4	253	56.70471	-132.0542
92.1	2859	56.60471	-132.1602
92.1	3804	56.60471	-132.1602
92.1	3805	56.60539	-132.1619
92.2	9691	56.57104	-132.1128
92.3	145	56.56944	-132.1051
92.3	146	56.56944	-132.1051
92.3	361	56.5687	-132.105
92.3	362	56.5687	-132.105
92.3	363	56.5687	-132.105
92.3	364	56.5687	-132.105
92.3	365	56.56791	-132.1017
92.3	366	56.56791	-132.1017
92.3	367	56.56791	-132.1017
92.3	368	56.56073	-132.1059
92.3	2848	56.56791	-132.1017
92.3	2849	56.56704	-132.1032
92.3	2850	56.56585	-132.1044
92.3	2851	56.56585	-132.1044
92.3	2852	56.56717	-132.0996
92.3	2853	56.56447	-132.0927
92.3	3750	56.56791	-132.1017
92.3	3800	56.56704	-132.1032
92.3	3801	56.56585	-132.1044
92.3	3802	56.56757	-132.0992
92.3	3803	56.56427	-132.0932
92.3	9688	56.5687	-132.105
92.3	9689	56.5687	-132.105
92.3	9690	56.5687	-132.105
92.4	369	56.5555	-132.0959
92.4	370	56.55525	-132.0952
92.4	9692	56.55588	-132.0976
92.4	9693	56.55568	-132.0969
92.5	371	56.5569	-132.076
93.1	607	56.5239	-132.0409
93.2	8848	56.5235	-132.0408
93.3	589	56.52322	-132.0407
93.4	8834	56.52315	-132.0408
93.5	985	56.52311	-132.0414
93.6	587	56.5231	-132.0411
93.7	588	56.5231	-132.0411
93.8	9587	56.52308	-132.0411
93.9	9586	56.52305	-132.0412
93.10	8832	56.52293	-132.0414
93.11	8833	56.52297	-132.0413
93.12	8829	56.52286	-132.0426
93.13	8973	56.52282	-132.0426
93.14	585	56.52277	-132.0426
93.15	586	56.52272	-132.0427
93.16	8830	56.52269	-132.042
93.17	125	56.5228	-132.0418
93.18	124	56.52283	-132.0417
93.19	8831	56.52288	-132.0415
93.20	126	56.52281	-132.041
93.21	601	56.52288	-132.0407
93.22	599	56.52257	-132.0408
93.22	600	56.52257	-132.0408
93.23	8842	56.52258	-132.0407
93.23	8843	56.52258	-132.0407
93.24	597	56.52253	-132.0407
93.24	598	56.52253	-132.0407
93.25	8841	56.5223	-132.0408
93.26	9588	56.52228	-132.0407
93.27	8840	56.52225	-132.0408
93.28	436	56.52232	-132.041
94.1	122	56.51537	-132.0439
94.1	123	56.51537	-132.0439
94.1	431	56.51537	-132.0439
94.1	432	56.51537	-132.0439
94.2	9584	56.51515	-132.0441
94.2	9585	56.51515	-132.0441
94.3	435	56.51488	-132.0443

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
94.3	8693	56.51488	-132.0443
94.4	434	56.51475	-132.0443
94.5	433	56.51417	-132.0436
95.1	438	56.51304	-132.0424
95.2	439	56.51277	-132.0422
95.3	121	56.51272	-132.0407
95.4	120	56.51228	-132.0402
95.5	437	56.51187	-132.0412
95.5	2640	56.51187	-132.0412
95.5	8694	56.51187	-132.0412
95.5	8695	56.51187	-132.0412
95.6	2641	56.51093	-132.0406
95.7	8696	56.51105	-132.0395
95.8	430	56.51048	-132.0391
96.1	144	56.51869	-132.0607
97.1	427	56.51933	-132.0524
97.2	419	56.51954	-132.0514
97.2	2834	56.51954	-132.0514
97.3	418	56.51098	-132.0515
98.1	101	56.517	-132.0598
98.1	102	56.517	-132.0598
98.1	103	56.517	-132.0598
98.2	99	56.51482	-132.063
98.2	265	56.51482	-132.063
98.2	2610	56.51482	-132.063
98.2	8836	56.51482	-132.063
98.2	8837	56.51482	-132.063
98.3	2639	56.51399	-132.0612
98.4	595	56.51379	-132.0612
98.4	8838	56.51379	-132.0612
98.5	100	56.51264	-132.0593
98.5	264	56.51264	-132.0593
98.5	593	56.51264	-132.0593
98.5	2611	56.51264	-132.0593
98.6	2612	56.51202	-132.0578
98.7	98	56.51192	-132.0577
98.8	263	56.51166	-132.0576
98.9	615	56.50806	-132.055
98.9	616	56.50806	-132.055
98.9	617	56.50806	-132.055
98.10	618	56.5081	-132.0554
98.11	8858	56.50799	-132.0554
98.12	8857	56.50791	-132.0553
98.13	626	56.50797	-132.0549
98.13	629	56.50797	-132.0549
98.14	627	56.50786	-132.0549
98.15	628	56.50779	-132.0548
98.16	630	56.50767	-132.0548
98.16	631	56.50767	-132.0548
98.17	8855	56.50786	-132.0545
98.17	8856	56.50786	-132.0545
99.1	127	56.50823	-132.0481
99.2	128	56.50795	-132.0466
99.3	8989	56.50528	-132.0483
99.4	991	56.50536	-132.0483
99.5	990	56.50538	-132.0481
99.6	992	56.50535	-132.048
99.7	8990	56.50513	-132.0477
99.8	9592	56.50464	-132.0486
99.8	9593	56.50464	-132.0486
99.8	9594	56.50464	-132.0486
99.8	9595	56.50464	-132.0486
99.8	9596	56.50464	-132.0486
99.9	130	56.50474	-132.048
99.9	131	56.50474	-132.048
99.9	132	56.50474	-132.048
99.9	133	56.50474	-132.048
100.1	428	56.50712	-132.0387
100.2	8690	56.5064	-132.039
100.3	8691	56.506	-132.039
100.3	8692	56.506	-132.039
101.1	8815	56.50273	-132.0425
101.2	8816	56.50275	-132.0417
101.2	8817	56.50275	-132.0417
102.1	641	56.50312	-132.053
102.2	648	56.50159	-132.0529
102.3	608	56.50019	-132.0522
102.4	610	56.50006	-132.0494
102.4	611	56.50006	-132.0494
102.5	609	56.50003	-132.0494
102.6	8863	56.49994	-132.049
102.7	634	56.49974	-132.0492
102.8	8852	56.49963	-132.0491
102.9	612	56.49953	-132.049
102.10	8850	56.49942	-132.0489
102.10	8851	56.49942	-132.0489
102.11	635	56.49936	-132.0488
102.12	8862	56.49977	-132.0484
102.13	636	56.49881	-132.0484
102.14	8864	56.49783	-132.0503
102.15	8865	56.49778	-132.0503
102.16	8866	56.49759	-132.0503
102.17	639	56.49719	-132.0498
102.17	640	56.49719	-132.0498
102.17	642	56.49719	-132.0498
102.17	643	56.49719	-132.0498
102.18	637	56.49696	-132.05
102.19	638	56.49708	-132.0498
102.20	8867	56.4963	-132.0503
102.21	644	56.49541	-132.0496
102.21	645	56.49541	-132.0496
102.21	646	56.49541	-132.0496

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
102.22	647	56.49516	-132.0495
102.23	8869	56.49477	-132.0491
102.24	9737	56.49458	-132.0491
102.25	995	56.4945	-132.0493
102.26	8870	56.49436	-132.0494
103.1	8821	56.49645	-132.0427
103.2	8820	56.49626	-132.0431
103.3	8818	56.49524	-132.0431
103.3	8819	56.49524	-132.0431
103.4	579	56.49303	-132.0389
103.4	580	56.49303	-132.0389
103.4	581	56.49303	-132.0389
103.4	8824	56.49303	-132.0389
103.4	8825	56.49303	-132.0389
103.4	8826	56.49303	-132.0389
103.5	576	56.49287	-132.039
103.5	577	56.49287	-132.039
103.5	578	56.49287	-132.039
103.6	8698	56.49279	-132.0431
103.7	2642	56.49271	-132.0432
103.7	8697	56.49271	-132.0432
103.8	440	56.4923	-132.0428
103.9	2643	56.49219	-132.0426
104.1	8704	56.49116	-132.0298
104.2	446	56.49101	-132.0279
104.2	447	56.49101	-132.0279
104.2	449	56.49101	-132.0279
104.2	450	56.49101	-132.0279
104.2	8703	56.49101	-132.0279
104.3	448	56.49083	-132.029
104.4	8699	56.49064	-132.0284
104.4	8700	56.49064	-132.0284
104.4	8701	56.49064	-132.0284
104.4	8702	56.49064	-132.0284
104.4	8705	56.49064	-132.0284
104.4	8706	56.49064	-132.0284
104.4	8707	56.49064	-132.0284
104.5	441	56.49068	-132.0282
104.5	442	56.49068	-132.0282
104.5	443	56.49068	-132.0282
104.5	444	56.49068	-132.0282
104.5	445	56.49068	-132.0282
104.5	451	56.49068	-132.0282
104.5	452	56.49068	-132.0282
104.5	453	56.49068	-132.0282
104.6	135	56.48912	-132.0298
104.7	134	56.48909	-132.0298
104.8	9597	56.48938	-132.0271
105.1	632	56.50429	-132.0306
105.1	633	56.50429	-132.0306
105.2	620	56.50245	-132.025
105.2	8859	56.50245	-132.025
105.3	619	56.50111	-132.0249
105.4	614	56.49832	-132.0223
105.4	8849	56.49832	-132.0223
105.5	656	56.49635	-132.0007
105.5	8873	56.49635	-132.0007
105.6	118	56.49163	-132.0163
105.6	606	56.49162	-132.0163
105.7	605	56.49192	-132.0154
105.8	117	56.49175	-132.0144
105.9	119	56.49159	-132.0141
105.10	116	56.4913	-132.015
105.10	8846	56.4913	-132.015
105.11	9580	56.49083	-132.0139
105.11	9581	56.49083	-132.0139
105.12	8847	56.48979	-132.0153
105.13	9582	56.49004	-132.0143
105.13	9583	56.49004	-132.0143
105.14	129	56.48355	-131.9976
105.15	613	56.4837	-131.9974
105.15	8853	56.4837	-131.9974
105.16	8854	56.48311	-131.9968
105.17	9590	56.48285	-131.9969
105.18	9589	56.48281	-131.9969
106.1	143	56.47939	-131.9976
106.2	9602	56.47859	-131.9971
106.2	9603	56.47859	-131.9971
107.1	2836	56.4928	-131.9992
107.1	2837	56.4928	-131.9992
107.1	2838	56.4928	-131.9992
107.2	422	56.49203	-131.9985
107.2	423	56.49203	-131.9985
107.2	424	56.49203	-131.9985
107.2	425	56.49203	-131.9985
107.2	426	56.49203	-131.9985
107.3	96	56.48924	-131.9998
107.3	97	56.48924	-131.9998
107.3	261	56.48924	-131.9998
107.3	262	56.48924	-131.9998
107.3	420	56.48924	-131.9998
107.4	584	56.48827	-131.998
107.5	92	56.48482	-131.9973
107.6	93	56.48441	-131.9971
107.7	454	56.48346	-131.9955
107.7	984	56.48346	-131.9955
107.8	254	56.48281	-131.995
107.9	583	56.48275	-131.9949
107.10	255	56.48273	-131.9949
107.11	91	56.48261	-131.9948
107.12	90	56.48254	-131.9947
107.13	8828	56.4827	-131.9944

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
107.14	8972	56.48241	-131.9939
107.15	8708	56.4792	-131.9915
107.16	256	56.47929	-131.9864
107.17	257	56.47929	-131.9863
107.18	258	56.47885	-131.9858
107.19	259	56.47663	-131.9882
108.1	9748	56.48656	-132.0335
108.2	1002	56.48551	-132.0344
108.3	1001	56.48342	-132.0374
108.4	9746	56.48333	-132.0373
108.5	9747	56.48219	-132.0378
108.6	1000	56.48278	-132.0401
108.7	2608	56.47779	-132.0262
108.7	2609	56.47779	-132.0262
108.8	989	56.46369	-132.0224
108.8	8988	56.4636	-132.0223
108.9	8874	56.46466	-132.0166
108.9	8875	56.46466	-132.0166
108.10	657	56.46453	-132.0158
109.1	376	56.47365	-132.0954
109.1	377	56.47365	-132.0954
109.1	378	56.47365	-132.0954
109.1	379	56.4719	-132.0964
109.1	380	56.47199	-132.096
109.1	2613	56.4719	-132.0964
109.1	9694	56.4719	-132.0964
109.1	9695	56.4719	-132.0964
109.1	9696	56.4719	-132.0964
110.1	2644	56.44691	-132.01
111.1	372	56.4394	-131.9653
111.1	373	56.4401	-131.9639
111.1	374	56.4406	-131.9638
111.1	375	56.4406	-131.9638
112.1	73	56.38958	-131.9568
112.1	241	56.38889	-131.9571
113.1	621	56.54902	-131.7386
113.2	623	56.53561	-131.7283
113.3	622	56.53263	-131.7258
113.4	575	56.53897	-131.7063
114.1	466	56.53349	-131.7011
114.2	476	56.53982	-131.6848
114.2	479	56.53779	-131.6912
114.2	480	56.5453	-131.6785
114.2	624	56.53235	-131.6824
114.2	625	56.53177	-131.6814
114.2	649	56.53743	-131.6842
114.2	650	56.5376	-131.6861
114.2	651	56.53744	-131.6901
114.2	8731	56.536	-131.6919
114.2	8733	56.5463	-131.6774
114.2	8734	56.5444	-131.6761
114.2	8860	56.53235	-131.6824
114.2	8861	56.53177	-131.6814
114.2	8871	56.53737	-131.6887
114.3	8732	56.549	-131.6578
115.1	2844	56.46477	-131.353
115.1	3736	56.46485	-131.3553
115.1	3746	56.46411	-131.3557
115.1	3747	56.46411	-131.3557
116.1	2840	56.45116	-131.2546
116.1	2841	56.45116	-131.2546
116.1	3741	56.45116	-131.2546
116.2	3737	56.4526	-131.2372
116.2	3738	56.4526	-131.2372
116.2	3739	56.4526	-131.2372
116.2	3740	56.45261	-131.2372
117.1	473	56.40992	-131.4123
117.1	8726	56.40992	-131.4123
117.2	2860	56.40815	-131.4138
117.2	2861	56.40815	-131.4138
117.3	455	56.40753	-131.415
117.3	456	56.40754	-131.4149
117.4	471	56.40398	-131.4142
117.4	8725	56.40398	-131.4142
117.5	1011	56.39967	-131.4055
117.5	9751	56.39967	-131.4055
117.6	1009	56.39921	-131.4072
117.6	1010	56.39921	-131.4072
117.6	9749	56.39921	-131.4072
117.6	9750	56.39921	-131.4072
117.7	8727	56.39692	-131.4126
117.7	8728	56.39692	-131.4125
117.7	8729	56.39692	-131.4125
117.8	475	56.39698	-131.412
117.9	474	56.39713	-131.411
117.10	487	56.39321	-131.3861
117.10	488	56.39321	-131.3861
117.11	481	56.39227	-131.3819
117.12	472	56.38923	-131.3965
117.12	604	56.38923	-131.3965
117.12	8845	56.38923	-131.3965
117.13	602	56.38798	-131.3928
117.13	603	56.38798	-131.3928
117.13	8844	56.38798	-131.3928
117.14	484	56.38777	-131.3926
117.15	482	56.38953	-131.3847
117.15	483	56.38953	-131.3847
117.16	8735	56.38689	-131.3854
117.16	8736	56.38689	-131.3854
117.17	8737	56.38702	-131.3844
117.18	8738	56.38682	-131.3836
117.19	2645	56.38706	-131.3825

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
117.20	2646	56.38684	-131.3826
118.1	463	56.39231	-131.1178
118.1	464	56.39231	-131.1179
118.2	470	56.38523	-131.1128
118.2	8717	56.3927	-131.1112
118.2	8718	56.393	-131.1072
118.2	8723	56.386	-131.1095
118.2	8724	56.386	-131.1095
119.1	2845	56.28709	-131.79
119.1	2846	56.28709	-131.79
119.1	2847	56.28709	-131.79
119.1	3748	56.28799	-131.7918
120.1	3929	56.20262	-131.6295
120.1	3930	56.20262	-131.6294
120.1	3931	56.20262	-131.6294
120.1	3932	56.20262	-131.6294
121.1	66	56.23066	-131.541
121.1	67	56.23116	-131.5401
121.1	234	56.2302	-131.5424
121.1	235	56.22977	-131.5438
121.2	68	56.22593	-131.509
121.2	69	56.22555	-131.51
121.2	236	56.22645	-131.5071
121.2	237	56.22625	-131.5079
121.3	70	56.23501	-131.4525
121.3	71	56.235	-131.4539
121.3	238	56.23582	-131.4513
121.3	239	56.2351	-131.4516
R1	147	56.90695	-134.31371
R2	150	56.89497	-134.18460
R3	149	56.89500	-134.18380
R4	3828	56.86386	-134.12347
R5	3827	56.84202	-134.10236
R6	3836	56.83170	-134.07084
R7	3835	56.82015	-134.10721
R8	3834	56.81488	-134.11742
R9	3833	56.81552	-134.26131
R10	9703	56.77266	-134.34142
R11	2375	56.77060	-134.34105
R12	9573	56.77060	-134.34105
R13	9572	56.77060	-134.34105
R14	2376	56.77001	-134.34147
R15	3832	56.76484	-134.25328
R16	3826	56.74148	-134.18901
R17	8753	56.72978	-134.20391
R18	3830	56.75156	-133.93627
R19	3831	56.75292	-133.92083
R20	3824	56.63844	-134.00067
R21	3825	56.63844	-134.00067
R22	3865	56.11406	-134.23902
R23	3866	56.11127	-134.22442
R24	2365	57.09914	-133.88408
R25	2362	57.09855	-133.88085
R26	2361	57.09894	-133.88010
R27	2360	57.09894	-133.88010
R28	3713	57.08260	-133.90760
R29	8673	57.08260	-133.90760
R30	8675	57.08100	-133.89530
R31	8674	57.08100	-133.89530
R32	3733	57.04320	-133.97840
R33	8670	57.02790	-133.96590
R34	3703	57.02790	-133.96590
R35	3704	57.02790	-133.96590
R36	8669	57.02790	-133.96590
R37	3732	57.00870	-133.94350
R38	3701	56.99070	-133.96210
R39	3702	56.99130	-133.96010
R40	3706	57.04080	-133.89130
R41	3709	57.05760	-133.80770
R42	3708	57.05360	-133.81650
R43	8672	57.05360	-133.81650
R44	3707	57.05220	-133.81850
R45	3720	57.04380	-133.80110
R46	3712	57.03990	-133.82230
R47	8679	57.03300	-133.81730
R48	8680	57.03810	-133.83080
R49	3722	57.03810	-133.83080
R50	3721	57.03810	-133.83080
R51	3719	57.03110	-133.84970
R52	8678	57.02300	-133.87040
R53	3718	57.01020	-133.86180
R54	3731	56.99700	-133.87210
R55	3875	56.96805	-133.85093
R56	8666	56.95730	-133.78670
R57	3696	56.95730	-133.78670
R58	3697	56.96360	-133.77830
R59	3698	56.96360	-133.77830
R60	8667	56.96360	-133.77830
R61	3699	56.95990	-133.77110
R62	8668	56.95570	-133.76070
R63	6416	56.93729	-133.65706
R64	3735	56.92690	-133.65970
R65	3734	56.92090	-133.63610
R66	3877	56.90921	-133.73202
R67	3884	56.86545	-133.64671
R68	3899	56.85683	-133.65243
R69	6414	56.85700	-133.65231
R70	3922	57.00091	-133.39623
R71	3923	57.00096	-133.39716
R72	3924	56.99987	-133.40131
R73	3925	56.99735	-133.40562
R74	8803	56.99654	-133.40592

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
R75	8802	56.99452	-133.40675
R76	3927	56.99238	-133.40718
R77	3926	56.98772	-133.40664
R78	3876	56.94176	-133.47315
R79	3683	56.96457	-133.41201
R80	3676	56.96080	-133.33840
R81	6375	56.96094	-133.33709
R82	6374	56.96106	-133.33702
R83	6373	56.96104	-133.33697
R84	6372	56.95961	-133.33630
R85	6365	56.98175	-133.29262
R86	6366	56.98082	-133.28975
R87	6370	56.91659	-133.27928
R88	6367	56.91707	-133.25577
R89	6391	56.85158	-133.41226
R90	6390	56.85106	-133.41194
R91	6388	56.84984	-133.40906
R92	6393	56.84607	-133.41122
R93	2358	56.84889	-133.34622
R94	231	56.86543	-133.30956
R95	230	56.86543	-133.30956
R96	6395	56.85930	-133.26166
R97	3907	56.81737	-133.34906
R98	59	56.81581	-133.32491
R99	229	56.82165	-133.29592
R100	57	56.82165	-133.29592
R101	56	56.82165	-133.29592
R102	6354	56.78659	-133.37336
R103	58	56.80194	-133.30840
R104	228	56.79473	-133.28557
R105	55	56.79473	-133.28557
R106	6413	56.78766	-133.27459
R107	6315	56.77394	-133.16898
R108	6327	56.74068	-133.15773
R109	6329	56.74161	-133.12303
R110	6382	56.73053	-133.14451
R111	939	56.70662	-133.06196
R112	8897	56.70653	-133.06188
R113	8896	56.70645	-133.06191
R114	8895	56.70642	-133.06194
R115	459	56.68420	-133.11920
R116	740	56.69025	-133.09406
R117	458	56.68930	-133.09130
R118	8711	56.68930	-133.09130
R119	457	56.68830	-133.08560
R120	6348	56.68055	-133.06951
R121	9684	56.67970	-133.01980
R122	9685	56.67970	-133.01480
R123	6285	56.66759	-133.06415
R124	352	56.66373	-133.03497
R125	353	56.66341	-133.03470

Map No.	Sample No.	Latitude	Longitude
R126	6345	56.65352	-133.00457
R127	3820	56.65986	-133.08919
R128	3819	56.65763	-133.08481
R129	3816	56.65608	-133.08268
R130	532	56.70349	-133.21888
R131	531	56.70187	-133.21941
R132	530	56.70186	-133.21935
R133	529	56.70007	-133.21785
R134	528	56.69833	-133.21767
R135	8800	56.69812	-133.21819
R136	3919	56.69799	-133.21928
R137	527	56.69410	-133.22517
R138	3918	56.69340	-133.22626
R139	3917	56.69260	-133.22765
R140	526	56.69320	-133.23613
R141	517	56.69203	-133.23264
R142	516	56.68995	-133.23405
R143	515	56.68898	-133.23449
R144	514	56.68833	-133.23472
R145	8752	56.67366	-133.23872
R146	8751	56.67288	-133.23875
R147	8651	56.66130	-133.25170
R148	49	56.65283	-133.25001
R149	935	56.64414	-133.21960
R150	8889	56.64185	-133.22339
R151	8887	56.63088	-133.20578
R152	542	56.62261	-133.16899
R153	8814	56.59437	-133.13714
R154	3953	56.59082	-133.12416
R155	3952	56.59082	-133.12416
R156	9648	56.58660	-133.11720
R157	24	56.58028	-133.10773
R158	25	56.58028	-133.10773
R159	26	56.58028	-133.10773
R160	210	56.58028	-133.10773
R161	186	56.50891	-133.44184
R162	187	56.48539	-133.43661
R163	184	56.47335	-133.44994
R164	183	56.47323	-133.44777
R165	182	56.47235	-133.44592
R166	9632	56.46363	-133.43006
R167	9633	56.45950	-133.44680
R168	525	56.59049	-133.06016
R169	523	56.58996	-133.05671
R170	524	56.59003	-133.05415
R171	282	56.58106	-133.06405
R172	830	56.57516	-133.00628
R173	728	56.57496	-133.00520
R174	725	56.57546	-133.00387
R175	726	56.57489	-133.00388
R176	828	56.57454	-133.00436

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
R177	829	56.57435	-133.00378
R178	727	56.57429	-133.00354
R179	684	56.57233	-133.05756
R180	8904	56.56470	-133.05260
R181	8745	56.55643	-133.04153
R182	8746	56.55718	-133.04109
R183	2638	56.55747	-133.03999
R184	816	56.53540	-133.05798
R185	817	56.53524	-133.05515
R186	815	56.53480	-133.05447
R187	2839	56.58131	-132.79075
R188	429	56.58131	-132.79075
R189	405	56.54049	-132.93240
R190	6356	56.53896	-132.88618
R191	2822	56.53691	-132.83188
R192	406	56.53691	-132.83179
R193	403	56.53521	-132.76475
R194	404	56.51998	-132.76066
R195	2821	56.51998	-132.76066
R196	8910	56.42466	-132.95016
R197	9649	56.42910	-132.94280
R198	283	56.42910	-132.94280
R199	8926	56.42614	-132.91229
R200	292	56.41070	-132.90630
R201	9652	56.41070	-132.90630
R202	8925	56.39797	-132.92759
R203	521	56.45755	-132.73070
R204	9716	56.45755	-132.73070
R205	522	56.44605	-132.73407
R206	9717	56.43852	-132.73793
R207	324	56.41730	-132.73580
R208	9670	56.41730	-132.73580
R209	323	56.40934	-132.73655
R210	9659	56.38005	-132.90760
R211	302	56.38151	-132.89663
R212	290	56.36200	-132.85660
R213	289	56.35190	-132.80590
R214	287	56.36450	-132.73820
R215	9650	56.36450	-132.73820
R216	285	56.37860	-132.68530
R217	284	56.37350	-132.66140
R218	286	56.35660	-132.69560
R219	288	56.33000	-132.71100
R220	297	56.31940	-132.99430
R221	9655	56.31940	-132.99430
R222	9653	56.29930	-132.96200
R223	294	56.29921	-132.85614
R224	591	56.23426	-132.85373
R225	592	56.23426	-132.85373
R226	590	56.23426	-132.85373
R227	8835	56.23603	-132.84950
R228	201	56.43772	-132.50161
R229	1	56.43770	-132.50083
R230	2	56.43798	-132.49981
R231	202	56.43792	-132.49909
R232	4	56.43783	-132.49854
R233	3	56.43780	-132.49850
R234	203	56.43773	-132.49718
R235	5	56.43779	-132.49645
R236	7	56.43844	-132.49513
R237	6	56.43878	-132.49442
R238	2618	56.42117	-132.53451
R239	2619	56.42117	-132.53451
R240	478	56.22184	-132.60399
R241	477	56.22184	-132.60389
R242	834	56.21418	-132.66633
R243	731	56.21152	-132.67431
R244	8712	56.20780	-132.66480
R245	460	56.20780	-132.66480
R246	8827	56.20183	-132.64793
R247	729	56.19156	-132.66418
R248	832	56.19160	-132.66401
R249	831	56.19158	-132.66393
R250	8713	56.18810	-132.64720
R251	8714	56.18530	-132.60360
R252	8730	56.19400	-132.54130
R253	8722	56.19730	-132.51160
R254	461	56.15644	-132.56803
R255	8715	56.16750	-132.52900
R256	462	56.17263	-132.45652
R257	3822	56.48629	-132.38045
R258	3821	56.48629	-132.38045
R259	3823	56.48629	-132.38045
R260	260	56.34232	-132.33886
R261	94	56.34232	-132.33875
R262	83	56.35301	-132.20557
R263	246	56.35301	-132.20557
R264	74	56.34098	-132.17162
R265	75	56.34098	-132.17162
R266	242	56.34098	-132.17162
R267	245	56.30719	-132.20620
R268	82	56.30719	-132.20620
R269	81	56.30719	-132.20620
R270	789	57.48540	-133.51346
R271	873	57.48521	-133.51273
R272	790	57.48525	-133.51177
R273	874	57.48522	-133.51174
R274	875	57.48507	-133.51157
R275	791	57.48215	-133.51425
R276	778	57.48532	-133.47426
R277	861	57.48535	-133.47408
R278	881	57.48158	-133.46719

Table B-4. Latitude and longitude coordinates for samples. (Coordinates are expressed in decimal degrees, North American Datum 1927 Alaska.)

Map No.	Sample No.	Latitude	Longitude
R279	2785	57.48147	-133.46680
R280	775	57.48184	-133.46494
R281	3688	57.48040	-133.47590
R282	3689	57.48040	-133.47590
R283	777	57.47920	-133.47785
R284	2786	57.47411	-133.47658
R285	860	57.48668	-133.43381
R286	776	57.48665	-133.43337
R287	876	57.46924	-133.51022
R288	2789	57.46538	-133.49918
R289	884	57.46532	-133.49812
R290	2788	57.45981	-133.49293
R291	883	57.45980	-133.49283
R292	2787	57.45065	-133.49180
R293	882	57.45047	-133.49166
R294	2790	57.45016	-133.42780
R295	2792	57.45325	-133.41331
R296	2793	57.45791	-133.38318
R297	885	57.43642	-133.39246
R298	2791	57.43638	-133.39250
R299	886	57.43601	-133.39244
R300	887	57.44274	-133.37426
R301	888	57.45509	-133.32576
R302	2794	57.45734	-133.31656
R303	2795	57.43162	-133.34432
R304	792	57.48995	-133.27259
R305	878	57.48730	-133.27825
R306	880	57.47709	-133.28329
R307	2784	57.47711	-133.28217
R308	794	57.47701	-133.27929
R309	879	57.47705	-133.27902
R310	793	57.47610	-133.26968
R311	877	57.47609	-133.26969
R312	889	57.40936	-133.27538
R313	871	57.38564	-133.46554
R314	787	57.38555	-133.46559
R315	788	57.39524	-133.43666
R316	872	57.39529	-133.43629
R317	2796	57.39515	-133.39059
R318	2797	57.39507	-133.39059
R319	890	57.39510	-133.39042
R320	768	57.39482	-133.38948
R321	786	57.36089	-133.45239
R322	870	57.36080	-133.45254
R323	785	57.36081	-133.45220
R324	783	57.34643	-133.37659
R325	784	57.34636	-133.37655
R326	863	57.34511	-133.37669
R327	780	57.34500	-133.37672

Map No.	Sample No.	Latitude	Longitude
R328	781	57.34500	-133.37672
R329	864	57.34500	-133.37672
R330	866	57.34939	-133.35968
R331	868	57.34857	-133.36025
R332	867	57.34859	-133.36017
R333	869	57.34687	-133.36462
R334	865	57.34414	-133.36261
R335	782	57.34414	-133.36259
R336	779	57.35088	-133.34047
R337	862	57.35042	-133.34004
R338	2807	57.31904	-132.96540
R339	390	57.33310	-132.87720
R340	2808	57.33230	-132.87500
R341	2855	56.74273	-132.04522
R342	2854	56.73830	-132.04710
R343	1008	56.54709	-132.07325
R344	1007	56.54754	-132.07208
R345	1006	56.54668	-132.06404
R346	1005	56.54572	-132.05969
R347	1004	56.54564	-132.05646
R348	1003	56.54565	-132.05644
R349	655	56.53564	-132.11206
R350	653	56.53564	-132.11206
R351	654	56.53564	-132.11206
R352	652	56.53680	-132.10200
R353	8872	56.53701	-132.09622
R354	9601	56.53202	-132.05173
R355	142	56.53270	-132.04960
R356	8822	56.52229	-132.04684
R357	8823	56.52229	-132.04684
R358	2637	56.50435	-132.05668
R359	594	56.47694	-132.13395
R360	95	56.49039	-131.99187
R361	3749	56.33295	-131.79357
R362	3744	56.31877	-131.62518
R363	3743	56.31775	-131.53115
R364	2843	56.31948	-131.52650
R365	3742	56.32776	-131.47668
R366	2842	56.45998	-131.37434
R367	582	56.37396	-131.33953
R368	3745	56.40191	-131.27778
R369	8868	56.39247	-131.11518
R370	8805	56.22657	-131.78490
R371	8806	56.22641	-131.78309
R372	3933	56.22838	-131.77493
R373	3934	56.22838	-131.77493
R374	3935	56.22429	-131.77131
R375	72	56.18509	-131.64585
R376	240	56.18491	-131.64397

APPENDIX C – INDUSTRIAL MINERALS

Industrial minerals are generally considered "nonmetallics." They include any rock, mineral, or other naturally occurring substance of economic value, except metallic ores, mineral fuels, and gemstones. This category spans a broad range of values–from sand and gravel or crushed stone worth several dollars per ton to industrial diamonds worth tens of millions of dollars per ton (Bates, 1994).

Industrial minerals differ from the metallics in that, whereas the end use of a metal is irrelevant to the exploration geologist, the end use of an industrial mineral is of paramount importance during exploration. For instance, a very valuable dolomitic marble suitable for dimension stone would have no value for use as a paper whitener or for cement production.

Within the Stikine study area, a number of state licensed rock quarries produce crushed stone for use in the immediate area (fig. 34, map nos. with prefix MHT and ADL). There are two licensed sand and gravel operations; Cascade Sand and Gravel (fig. 34, Pit #ADL106690), which mines and ships material from Thomas Bay, and Critter Enterprises (fig. 34, Pit #ADL106528), which mines from the bed of the Stikine River and ships material from Wrangell. Both produce a variety of products for barge shipment throughout southeast Alaska.

In the past, significant exploration took place for carbonate dimension stone, limestone, and marble. And although several patents for claims were granted in the area, the quality was not high enough to warrant full-scale production. Some material from the most heavily examined site, on Ham Island (fig. 34, map no. I8), was used locally for headstones.

The other location worth noting is Garnet Ledge (also known as Ruby 1 & 2) on the mainland, just south of the mouth of the Stikine River (fig. 34, map no. M10). Although the material mined was not technically an industrial mineral, because it was intended to be sold as a gemstone, the reject and waste material from the gemstone production was used as a refractory material, which falls within the industrial mineral category. This property was also patented.

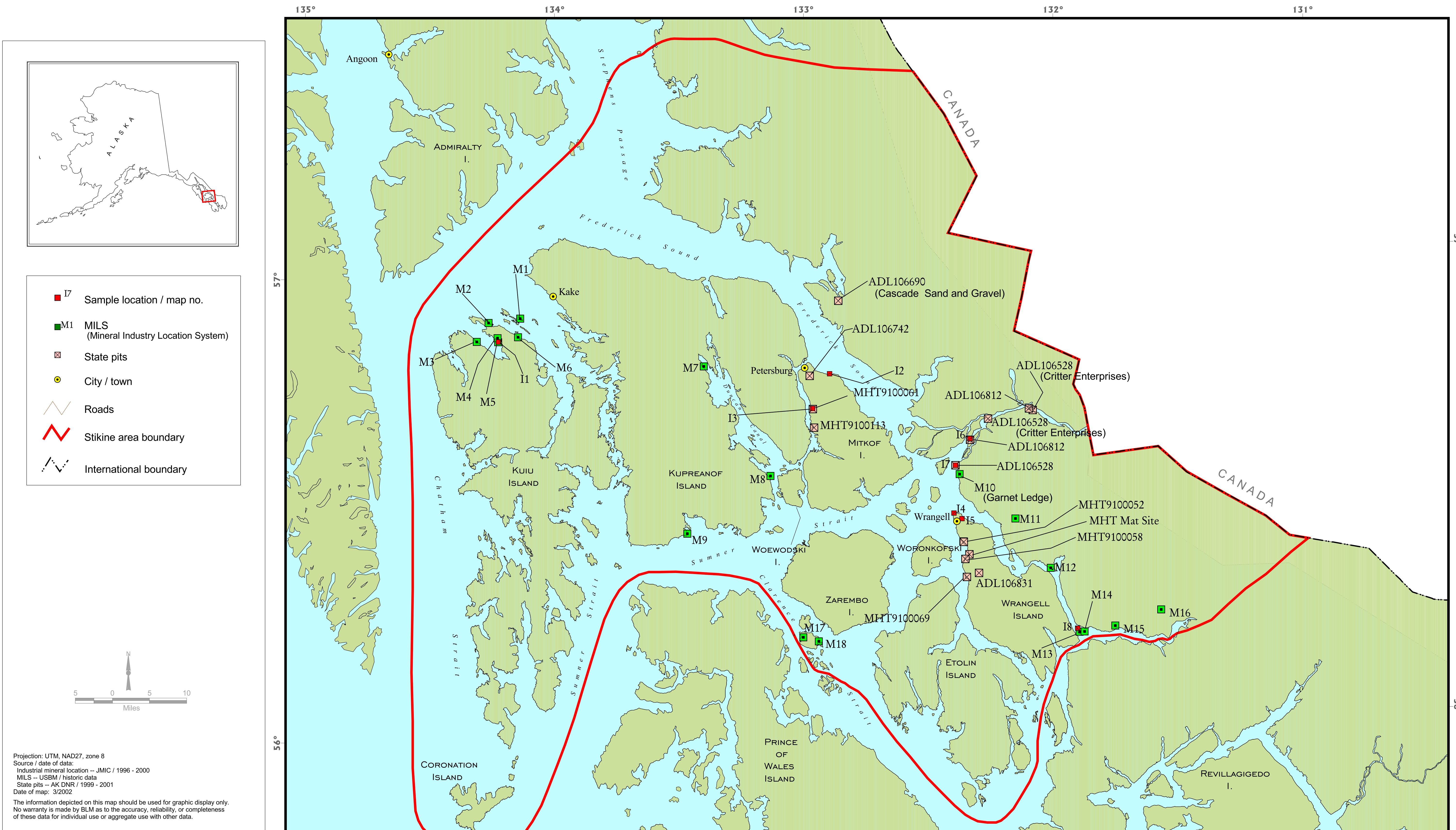

Figure 34. Map of industrial mineral locations.

CRUSHED STONE AND SAND AND GRAVEL

General Overview

Crushed stone and sand and gravel are common rock materials used in an assortment of construction projects. In the United States, the amount of crushed stone sold or used by producers exceeds that of sand and gravel–in 1989, 1,039 Mt for crushed stone versus 788 Mt for sand and gravel. Crushed stone accounts for over half of the natural aggregate consumed in the U.S. (Herrick, 1994). In Alaska during 1989, 14.4 Mt of sand and gravel and 2.91 Mt of crushed quarry stone were produced (Bundtzen and others, 1989). In Alaska during 1999, production of sand and gravel had decreased to 10.6 Mt, and quarry production was down to 1.64 Mt (Swainbank and others, 1999).

In commercial usage, sand is designated as rock or mineral fragments ranging in size from 0.074 to 4.76 mm. Gravel consists of rock or mineral fragments ranging in size from 4.76 to 88.9 mm. Aggregate is commonly defined as the inert fragmental material, (commonly sand, gravel, crushed stone, or cinders) that is bound into a conglomerate mass by a cementing material such as portland cement, asphalt, or gypsum plaster (Goldman, 1994).

As an aggregate, sand and gravel is used by the building and paving industries in portland cement concrete, by the building industry in mortar and plaster, and by the paving industry in asphalt. Sand and gravel is also used as construction fill, road- and sub-base material, and decoration (Goldman, 1994).

The requirements are more stringent for sand and gravel used as aggregate in asphalt or portland cement concrete or for the top layer of gravel roads than they are for ordinary construction fill, road base, or sub-base. Suitable material consists of properly shaped particles that are clean, uncoated, sound, and durable. For asphalt pavement, the additional specification for flat and elongated particles has become more difficult to meet for many local producers, especially those quarrying material from some sedimentary and metamorphic rock sources (ADOT&PF, 1998).

The physical and chemical properties of the aggregate particles determine the quality of the aggregate. Mineral or rock particles that are physically weak, extremely water-adsorbent , and easily cleaved are not suitable for high-quality aggregate (Goldman, 1994).

Various rock types have certain physical characteristics that make them suitable or not for high-quality aggregate, such as for base and surface course, asphalt concrete pavement, cover coat and surface treatment, or as subbase as currently specified for highway construction in Alaska (table C-1, C-2, C-3, and C-4 this report). Hard, dense sandstones and limestones are ordinarily satisfactory. However, many sandstones are friable, excessively porous, and clay-bearing. Shales usually make poor aggregate material. Soft, weak, and absorbent, they assume flat, slabby shapes that lack strength. Hard, tough, and dense–most igneous rocks are satisfactory; however, some volcanic flow rocks may have low strength and be extremely porous and highly water absorbent. A large variation exists in the physical suitability of metamorphic rocks. Quartzites tend to be massive, tough, and dense. Coarse-grained marbles have low abrasion resistance, while fine-grained marbles tend to be durable. Gneisses are usually very tough and durable. Thinly laminated schists and slates tend to assume flat slabby shapes that lack strength and do not pack well. Micaceous minerals are susceptible to splitting along cleavage planes, which causes a reduction in particle strength and durability. Igneous and metamorphic rocks with high percentages of micaceous minerals will tend to weather faster and be less durable. Furthermore, when micas and other minerals in these igneous and metamorphic rocks have the same orientation, the rocks will tend to break into elongated rather than cubic pieces, which do not pack as well. Sand and gravel deposits derived from otherwise suitable rock types may become undesirable due to weathering processes, especially ground waters, which deposit coatings of calcium carbonate, clay, silt, opal, chalcedony, iron oxide, manganese oxide, and gypsum. These coatings can decrease the strength of the aggregate-cement bond (Goldman, 1994).

The chemical properties of certain rocks and minerals that will limit suitability for concrete are: (1) reacting with high-alkali cement, (2) leaching of water soluble substances, (3) being in solution with secondary minerals, which accelerates deterioration of susceptible aggregate particles, and (4) containing weathering-produced compounds, which slow cement hydration, discolor pavement, or weaken the concrete. The Percent Sodium Sulfate Loss test (AASHTO T-104) in table C-2 and C-3 will normally determine which mineral materials are chemically suitable for concrete aggregate. Normally non-reactive rocks such as sandstone, shale, basalt, granite, and other rock types may be reactive if impregnated or coated with opal, chalcedony, or other reactive substance. In addition, aggregates may also present a problem in bituminous mixes when the bituminous film separates or strips from the aggregate. Stripping may result if the surface of the mineral aggregate is negatively charged, which will attract moisture and thus promote stripping. Rocks with a high-silica content, such as some quartzites, gneisses, granites, and schists may have stripping problems; however, surfactant chemicals may be added to the asphalt mix to reduce stripping (Herrick, 1994).

Field examination of potential aggregate sources provides a good idea of the engineering qualities, but laboratory test methods are generally used to make a final determination of the engineering properties of the aggregate source material. Current test methods and minimum acceptable levels for common high-quality aggregates as specified by Alaska Department of Transportation are listed in Table C-1, C-2, C-3, and C-4 of this report. These tables also show the changes in requirements between 1988 and 1998.

The total cost of processed aggregate is attributed to acquiring the deposit; stripping, crushing, screening, stockpiling, and transporting the final product; and meeting environmental and safety requirements. Drilling and blasting is an additional expense for crushed stone producers.

Sand and gravel and crushed stone for construction are low-value-per-ton commodities and are generally sold in large quantities. The distance and means of hauling the product are the factors which most effect an escalation in the delivery price. Ordinarily this means that producers (quarries or borrow pits) are located relatively close to consumers (road, highway, or building site); however, when local producers cannot meet the specifications for a product, a relaxation of the specifications may be allowed in order to prevent cost overruns. Alternately, rigid adherence to specifications may result in longer haul distances and the higher associated cost. Fortunately for Southeast Alaska, by far the cheapest method of shipping aggregate is ocean transport (Herrick, 1994). All large communities in Southeast Alaska are along the coastline.

Sand & Gravel

In addition to the size ranges that define sand and gravel from an engineering standpoint, further distinguishing features are that sand and gravel usually come from sedimentary deposits of various types and ages, and that the production of individual fragments is a result of natural forces. The origins of these sedimentary deposits are the various igneous, metamorphic, and sedimentary rock units. These massive rock units weather by chemical and physical means into smaller fragments that are carried down gradient by mass wasting, glacial actions, water, or wind– or perhaps combinations of these forces. When carried by large streams or rivers over long distances, the particle size becomes smaller due to the rolling and tumbling that the rock fragments undergo. The weaker particles break down more rapidly, such that the further the deposit is from the rock unit source, the more durable material will constitute a higher percentage of the large fragments. This natural activity of water, ice, and wind produces sand and gravel sources such as current or ancient river channel deposits, glacial deposits, and alluvial fans–along with marine and lacustrine deposits. The best deposits will be those derived from rock units primarily composed of massive, tough, dense, chemically stable mineral materials (Goldman, 1994).

Preliminary field evaluation by a geologist or an engineer with geologic training often provides an adequate first-phase evaluation of a deposit as a possible source of aggregate material. The important skills necessary in order to perform a proper field evaluation include the ability to identify: (1) different depositional types (stream terrace, glacial till, alluvial fan), (2) source-rock type and associated predominant minerals, (3) physical condition of the rock–grading, rounding and degree of uniformity, particle size, and shape, and (4) location, thickness and type of overburden and ground water level (Goldman, 1994).

Photo 35. Critter Enterprises sand and gravel stockpile near Wrangell ferry terminal. Photo by J. Still.

Two licensed commercial sand and gravel mining operators operated in the Stikine area as of December, 2001: Critter Enterprises (photo 35) and Cascade Sand and Gravel (photo 36). Critter Enterprises has Alaska State leases for three locations within the active river channel toward the lower end of the Stikine River. Cascade is extracting its aggregate from a large deposit of glacial till south of Thomas Bay which is also on state land. Both operations use barges to transport their product to distribution points–Petersburg for Cascade Sand and Gravel and Wrangell for Critter Enterprises, in addition to other sites throughout southeast Alaska. Cascade Sand and Gravel processes its material adjacent to its pit and is able to direct ship product via barge without going through Petersburg. Both operations can crush oversized material when a fractured product is needed. The product is delivered and either offloaded from the barge in bulk or in ½- or 1-cubic-yard bags (Orrie Bell, Cascade Sand and Gravel, oral commun., 1998; Lauren Enright, Critter Enterprises, oral commun., 1998).

Crushed Stone

Crushed stone is usually produced by blasting rock in a quarry and then reducing the fragments to the desired size by mechanical means, however, depending on the intended use, blasting method, and source rock, further size reduction may not be necessary. In the United States in 1989, approximately 71 percent of the crushed stone was from limestone and dolomite, followed in decreasing volume by granite, traprock, sandstone and quartzite, miscellaneous stone, marble, shell, calcareous marl, volcanic cinder and scoria, and slate (Herrick, 1994).

Photo 36. Cascade Sand and Gravel operations near Thomas Bay. Photo by J. Still

Over the past few years, the Alaska Department of Natural Resources has listed about 15 to 20 active quarries on Mental Health Trust or Alaska state land in the Stikine area. Some sites only produce small quantities on an intermittent basis. Most of the active material sites in the Stikine study area are quarries where shot rock is produced as fill for road building, especially for Forest Service logging roads. However, with the decrease in logging throughout Southeast Alaska, there has been a dramatic decrease in logging road construction and maintenance. In 1996, the highest usage year over the past several years, the Forest Service used approximately 689,000 cubic yards of rock in the Stikine study area. In 1999 the usage was down to 86,000 cubic yards, a decrease of 88 percent (Bob Gubernica, oral commun., 1999).

Within the same time frame, the Cabin Creek Dam Project, southeast of Petersburg on Mitkof Island, used a significant volume of shot rock for the dam embankment and the pipeline road to Petersburg. The 8.27-mile-long road, which was constructed in 1998 and 1999, used a total of 122,000 cubic yards of shot rock from five quarries. The dam was started and completed in 1997 and used 126,700 cubic yards of shot rock from one quarry in its earth-fill construction.

Some concrete was used for the spillway and for the two wing walls (Bruce Jones, oral commun., 2001).

Bureau Investigation

In 1999 BLM personnel took sand and gravel samples from Critter Enterprise's stockpile and shot rock samples from several quarries. Other quarries were also sampled. Personnel checked outcrops and exposures in the search for high-quality rock material in areas where future development is likely to occur. Sample results are included in table C-5.

A literature search was also made of State of Alaska Department of Highways files for materials site investigations and quarry test results. Some information was also obtained from the U.S. Department of Transportation, because they built a few roads in Southeast Alaska. One of the most noteworthy reports found during the literature search was a report entitled "Materials Site Investigation: Dry Straits Crossing" written in September, 1967, by the Alaska Department of Highways. In it, authors make note of "...large areas of outcropping and near-surface granitic bedrock at the far eastern extremity of Mitkof Island and the southernmost end of Dry Island."

Results

General considerations for the development of an economic aggregate site are: (1) a location that allows easy heavy-equipment and haul-truck or barge access, (2) a large volume of product with consistent quality, and (3) a product able to meet or exceed all specifications with minimal production expense (sizing, crushing, and washing) with a minimum of waste (non-salable byproduct).

Between 1988 and 1998, the Alaska Department of Transportation added new specifications for a number of aggregate materials used for asphalt paving and repair; these are shown in the comparison tables C-1, C-2, C-3, and C-4 of this report (ADOT&PF, 1988;1998). These additional requirements, such as the thin and elongate criteria for bituminous aggregate, have sometimes made existing sources no longer suitable for certain end products. The additional specifications require additional tests, which results in higher exploration and production costs and also reduces the number of potential sources for material.

As with sand and gravel aggregate, the best material will be derived from rock units primarily composed of massive, tough, dense, chemically stable mineral materials. Natural erosion processes break down rock by means of physical and chemical weathering along pre-existing weaknesses or at corners that present a high surface area relative to mass. Ideally a rock with no pre-existing mineral-, fracture-oriented or other weakness would break into a cube and ultimately weather into a sphere. The same rock when quarried would also ideally break into cubes.

Whether aggregate material is being mined from a sedimentary deposit or quarried from an outcrop, a significant percentage of elliptical and/or flat cobbles or elongated and/or flat rock fragments should raise a concern that the material, upon being crushed to size, will produce an unacceptably high level of thin, elongate pieces.

Conclusions

More stringent requirements for aggregate to be used for asphalt concrete pavement and other high end uses has resulted in a reduction of availability and increased costs. The higher quality material specified will be more durable, and the longer service life will ultimately reduce the overall costs. Existing quarries located in Southeast can continue operation, producing the higher quality aggregate.

Table C-1. 703-2.03 Comparison of 1988 and 1998 requirements by Alaska Department of Transportation for aggregate for base and surface course

Property	Test method	1988 Base requirement	1998 Base requirement	1988 Surface requirement (not listed)	1998 Surface requirement
Percent of Wear	AASHTO T-96	50 % max.	50 % max.		45 % max.
Degradation Value	ATM T-13	45 min.	45 min.		45 min.
Percent Fracture	ATM T-4	70 % min.	70 % min.		70 % min.
Liquid Limit	AASHTO T-89	Not Specified	Not Specified		35 max.
Plastic Limit	AASHTO T-90	Not Specified	6 max.		10 max.

Table C-2. 703-2.04 Comparison of 1988 and 1998 requirements by Alaska Department of Transportation for aggregate for asphalt concrete pavement

Property	Test method	1988 Requirement	1998 Requirement
Percent of Wear	AASHTO T-96	45 % max.	45 % max.
Degradation Value	ATM T-13	30 min.	30 min.
Percent Sodium Sulfate Loss	AASHTO T-104	9 % max.	9 % max. (5 cycles)
Percent Fracture	ATM T-4	70 % min.	80 % min. (single face)
Thin, Elongate Pieces	ATM T-9	Not Specified	8 % max.

AASHTO: American Association of State Highway and Transportation Officials
ATM: Alaska Test Method
min.: minimum acceptable value
max.: maximum acceptable value

Table C-3. 703-2.05 Comparison of 1988 and 1998 requirements by Alaska Department of Transportation for aggregate for cover coat and surface treatment

Property	Test method	1988 Requirement	1998 Requirement
Percent of Wear	AASHTO T-96	Not Specified	45 % max.
Degradation Value	ATM T-13	50 min.	50 min.
Percent Sodium Sulfate Loss	AASHTO T-104	9 % max.	9 % max. (5 cycles)
Percent Fracture	ATM T-4	90 % min.	90 % min. (single face)

Table C-4. 703-2.09 Comparison of 1988 and 1998 requirements by Alaska Department of Transportation for aggregate for subbase

Property	Test method	1988 Requirement	1998 Requirement
Percent of Wear	AASHTO T-96	Not Specified	50 % max.
Liquid Limit	AASHTO T-89	25 max.	25 max.
Plastic Limit	AASHTO T-90	6 max.	6 max.
Degradation Value	ATM T-13	40 min.	40 min.

AASHTO: American Association of State Highway and Transportation Officials
ATM: Alaska Test Method
min.: minimum acceptable value
max.: maximum acceptable value

Table C-5. Aggregate analysis table

Location #, site name & type of material sampled	ATM T-4 Fracture face count	ATM T-9 Flat and elongated particles		ATM T-13 Degradation test	AASHTO T-210 Degradation test - sand	AASHTO T-89/90 Atterburg limits test	AASHTO T-96 Los Angeles abrasion test		AASHTO T-104 Sulfate soundness
	% Fracture Two Face	Flat %	Elongated %	Degradation value	Degradation value	Liquid limit/ Plastic limit	Grading	% Loss after 500 revolutions	Avg. % loss after 5 cycles
Acceptable Quality for Aggregates *	B = 70 % min S = 70 % min AP = 80 % min (1 face) ACC = 90 % min (1 face)	Not Specified	AP = 8% max	B = 45 min S = 45 min SB = 40 min AP = 30 min ACC = 50 min	Not Specified	B = PL < 6 S = LL < 35, PL < 10 SB = LL < 25, PL < 6	Not Specified	B = 50 % max S = 45 % max SB = 50 % max AP = 45 % max ACC = 45 % max	AP = 9 % max ACC = 9 % max
I3 - Falls Creek - Quarry Spalls	100	54.2	9.3	55		will not flow/ will not roll	"A"	26.8	2.9
I2 - Roadside pit Shot Rock	100	13.1	11.0	59		will not flow/ will not roll	"A"	18.8	0.3
I5 - State Pit - Shot Rock	100	12.5	12.3	54		will not flow/ will not roll	"A"	26.5	1.6
I4 - Airport Pit - Shot Rock	100	10.0	13.3	78		will not flow/ will not roll	"A"	35.7	0.3
ADL106528 Critter Enterprises - Sand & Gravel					98	will not flow/ will not roll			3.0

* ADOT, 1998A P: Asphalt PavementACC: Asphalt Cover CoatSB: Subbase
S: SurfaceB: BaseLL: Liquid LimitPL: Plastic Limit
AASHTO: American Association of State Highway and Transportation Officials
ATM: Alaska Test Methods

CARBONATES: LIMESTONE, DOLOMITE, AND MARBLE

General Overview

The carbonate rocks are primarily limestone, dolomite, and marble. These are rocks of sedimentary or metamorphic origin composed principally of calcium carbonate or magnesium carbonate, or some combination of these. Included are the recrystallized limestone and dolomite rocks called marble. Considering the known chemistry and characteristics of the carbonate rocks in the Stikine area, the most likely uses would be as a raw material for cement production, as a paper brightener, or as dimension stone.

General considerations for the development of an economic carbonate rock deposit vary somewhat depending on final end use, but usually include extent, color, lack of objectionable impurities, absence of fractures or joint planes and of intersecting dikes, ease of quarrying and loading on cargo vessels, distance and freight rates to markets, and competition. The most serious hindrance to profitable quarrying of dimension stone in southeastern Alaska is the fracturing and jointing of beds. The heavy rainfall and influence of the dense vegetation in the region have softened the surface marble to a depth far more than is found in dryer regions in the continental U.S. (Burchard, 1920).

One occurrence of carbonate rock in the Stikine area satisfies at least some of the above for the development of an economic limestone deposit. There is a thick bed of Silurian age limestone along the west side of Saginaw Bay, on Kuiu Island, with a 15,000-foot beach exposure. Here, the bed is 1,000 feet thick, has a carbonate purity of 96.7 percent, and represents 25 million tons of raw material within a 1-mile radius of where docks could be built. The relatively high purity, large volume, and proximity to easy transport would make this resource the most likely target for carbonate rock development in the Stikine area.

Location/Access/Land Status

The Stikine area has numerous large tracts of predominantly carbonate rock located, along the east side of Thomas Bay, at Hamilton Bay on Kupreanof Island, Towers Arm and Emily Island in Duncan Canal on Kupreanof Island, both sides of Bradfield Canal, eastern Wrangell Island and the mainland across Blake Channel including Blake Island, Keku Islands in Keku Strait, Security Bay of Kuiu Island, the peninsula along the north side of Saginaw Bay of Kuiu Island, Bushy Island and Shrubby Island in Clarence Strait, and at Virginia Lake on the mainland east of Wrangell (Hodge, 1944; Roehm,1946b). Some of these have been explored, staked with claims, and mapped, but only one was a producer. The only recorded commercial production of limestone or marble from the Stikine area was from Ham Island (currently called Blake Island) at the south end of Blake Channel between southeastern Wrangell Island and the mainland (Roppel, 1991).

Although there has been extensive road building within the Stikine area for timber harvest purposes and other development, relatively little has occurred that would benefit the exploration or development of carbonate resources. Access to these sites for exploration purposes would likely be by boat, float plane, or helicopter. Transport of supplies for mine development and of mined product would be by barge or ship.

The only patented claims for marble or limestone in the Stikine area are those on Blake (Ham) Island, patents 470500 and 541522, issued to the Vermont Marble Co.. No current unpatented claims for carbonate materials are being held in the Stikine area (BLM, ALIS). Most of the known limestone deposits are on land that is administered by the Forest Service and is open to exploration and development, however, large areas have either been selected or patented by Native corporations at Hamilton Island, Cornwallis Peninsula and adjacent Keku Islets, and the eastern shore of Security Bay. The State of Alaska, Department of Natural Resources (DNR) has restrictions on mining on the southern tip of the Lindenburgh Peninsula and part of the eastern shore of Security Bay (Bottge, 1987).

History

In1899, W.F. Woodbridge, Peter C. Jensen, J.H. Causten, Frank Whitney, and John F. Collins staked what would become the first patented claims for carbonate rock in the Stikine area on the west side of Blake Island. At about the same time, Edward Miller was staking and exploring claims on the east side of the island. These would also eventually go to patent. By 1905, the claims on the west side of the island had been developed into a quarry supplying blocks of marble that were cut and polished into marble slabs and monuments. W.F. Woodbridge and Isaac Lowry were partners in this business, known as the Wrangell Marble Works. Production continued through 1908 when the Vermont Marble Co. took an option on the seven claims. In 1909 the Vermont Marble Co. bought the claims from Woodbridge and Lowry. In 1912 the company extended its holdings by buying the two claims belonging to Miller alone. In 1913 the company began an extensive exploration program at several locations in Southeast Alaska to test the deposits it had acquired. Blake Island was the only one of the acquisitions tested located in the Stikine area. The company was disappointed to find that most of the marble on Blake Island was coarse, grey, vertically layered, and highly fractured. By October 1913, the Vermont Marble Co. had removed the exploration crews and machinery. Although no work has taken place on Blake Island since 1913, the company received the patent to the claims on the west side of the island in April of 1915 and received the patent to the claims on the east side of the island in August of 1917. Vermont Marble Co. remains the owner of record (Roppel, 1991; BLM, ALIS).

Geology

Within the Stikine area, carbonate rocks form a significant part of the Paleozoic systems, except for the Ordovician. They are insignificant in the Mesozoic, except for the Upper Triassic, and absent from the Cenozoic. An interesting feature is the occurrence of coarse, waterworn, intra-formational limestone conglomerate (Buddington, 1929).

The marble of Blake Island is Cretaceous to Permian in age (Gehrels, 1992). More marble of this age extends to the east for several miles a little north of the shores of Bradfield Canal (Buddington, 1929). Analysis from Blake Island shows that it is a dolomitic marble (Berman, 1999).

Limestones found around Duncan Canal on Kupreanof Island are of Devonian age (Buddington, 1929). A sample taken on the west side of Towers Arm had a $CaCO_3$ content of 93.23 percent, with the only significant impurities being dolomite and iron oxide (Roehm, 1946b).

The Permian limestones of southeastern Alaska usually have intercalated layers of chert. Locally, however, thick clean beds are present. Permian age limestones are found on or near the northern part of Kuiu Island. They make up much of the Keku group of islands and the adjacent shore of Kuiu Island. Permian limestones also form the line of conspicuous bluffs along the northeast side of Saginaw Bay and the island opposite the abandoned cannery on the east side of Saginaw Bay, Kuiu Island (Buddington, 1929). Analysis of material from the high bluff on the southwest side of the island shows it to be high-calcite limestone (Buddington, 1929, p. 393).

Triassic age limestones crop out east of Point Cornwallis, on Kuiu Island, and Upper Triassic limestones are exposed on the islands in Hamilton Bay on Kupreanof Island. These limestones are usually medium- to thin-bedded and have intercalated layers of black slate. Most of them are probably impure argillaceous and siliceous calcite limestones (Buddington, 1929). A sample taken along Keku Strait shows the rock to be an impure calcite limestone (Buddington, 1929). Impure limestones are suitable for cement production, but because they are so relatively common on a world wide basis development of these deposits is highly unlikely.

Silurian age limestones on Kuiu Island form Beauclerc Peak and the range of mountains along the southwest side of Saginaw Bay. Shrubby and Bushy Islands, in Clarence Strait, are also Silurian age. Bushy Island is limestone and conglomerate, and Shrubby Island is entirely limestone. Samples taken of Silurian limestones in Southeast Alaska are prevailingly high-calcite with 95 to 98 percent of calcium carbonate (Buddington, 1929). These limestones are predominantly thick-bedded, dense limestones, intercalated with thick beds of coarse conglomerate (Buddington, 1929). On the south side of the Keku Island group, a string of three long, narrow islands is composed predominantly of dense, white limestone. There, intercalated beds of coarse limestone conglomerate are 20 feet or more thick. These conglomerates are made up entirely of limestone fragments in a limestone matrix. Some fragments are up to 2 feet in diameter. Fossils are common within the fragments, and some are waterworn coral heads (Buddington, 1929).

Bureau Investigation

In 1999 BLM personnel collected samples from the occurrence on the northeast side of Saginaw Bay. Personnel collected rock from the southwest side of the bluff on the island that lies opposite the abandoned cannery in Saginaw Bay. Analysis of the samples indicated high calcium carbonate limestone (97.59 percent $CaCO_3$), but the Hunter Dry precipitated calcium carbonate (PCC) brightness was 92.87 percent, which is below the commonly accepted minimum of 95 percent (fig. 34, sample I1). The samples also decrepitated badly upon ignition, which would cause significant dust losses and other problems. Since these samples were taken of near-surface material, a sample taken deeper within the mass of rock may show somewhat different properties.

A sample was also collected from the west side of Blake Island and tested for purity and brightness. This sample proved to be a dolomitic marble with a 60.15 percent $CaCO_3$ content (fig. 34, sample I8). It also had a severe decrepitation problem, which along with the low $CaCO_3$ content made it unsuitable as a paper brightener or for cement production. The relatively poor quality as a dimension stone had already been proven by the Vermont Marble Co. during its extensive exploration program on Blake Island.

Conclusions

The most serious hindrance to profitable quarrying of carbonate rock for dimension stone in southeastern Alaska is the fracturing and jointing of beds. The heavy rainfall and influence of the dense vegetation in the region have softened the surface marble to a depth far more than is found in dryer regions in the continental U.S. (Burchard, 1920).

One occurrence of carbonate rock in the Stikine area satisfies at least some of the criteria for the development of an economic carbonate rock deposit for cement or as a paper brightener. There is a thick bed of Silurian age limestone along the west side of Saginaw Bay, on Kuiu Island, with a 15,000-foot beach exposure. Here, the bed is 1,000 feet thick, has a carbonate purity of 96.7 percent, and represents 25 million tons of raw material within a 1-mile radius of where docks could be built. The relatively high purity, large volume, and proximity to easy transport would make this resource the most likely target for carbonate rock development in the Stikine area.

Table C-6. Analyses of limestone from the Stikine area

Map no., MAS no.	Name	% $CaCO_3$	% $MgCO_3$	% Fe_2O_3	% Al_2O_3	ppm $SrCO_3$	ppm MnO	% SiO_2	ppm BaO	ppm K_2O	ppm Na_2O	ppm P_2O_5	ppm TiO_2	% Total
M4, 21160034	East Saginaw Bay[1] Limestone, Sample 99Q3	97.59	1.04	0.072	0.064	279	168	1.12	11	155	188	<70	32	99.97
M13, 21180078	Ham (Blake) Island[1], Sample IEWRM4	60.15	38.54	0.066	0.021	194	34	1.13	12	42	33	<70	2	99.94
M17, 21170081	Shrubby I.,[2] Mud Bay	95.48	1.05	0.44	0.18			1.48% insol.				160		
M18, 21170080	Shrubby I.,[2] Piledriver Bay	94.6	3.57	0.40	0.10			0.54% insol.				150		
M3, 21160069	Saginaw Bay,[2] west side	96.7	0.63	0.21	0.12			1.03% insol.				110		
M5, 21160068	Saginaw Bay,[2] east side	23.40	5.90	2.7 % combined				67% insol.						
M7, 21170079	Towers Arm,[2] Duncan Canal	93.23	4.7	1.07% combined				0.32% insol.				2870		
M2, 21160014	Keku Staits,[3] Kuiu Island	87.19	0.84					11.3% insol.						
M11, 21170063	Lake Virginia,[4] east of Wrangell	53.69	26.10					19.1% insol.						

1 - Analysis done by S. Berman for U.S. Bureau of Land Management for this study
2 - Analysis done by N. Johansson for J.C. Roehm
3 - Analysis done by J.G. Fairchild for A.F. Buddington
4 - Analysis done by R.K. Bailey for E.F. Burchard

GARNET

Location/Access/Land status

The most significant garnet occurrence, and the only occurrence to be successfully mined in Southeast Alaska, is the Ruby 1 & 2 , also known as Garnet Ledge (Roppel, 1991; Buddington, 1929). It is 7½ miles north of Wrangell, south of the mouth of the Stikine River. The site can be reached by boat, float plane, or helicopter. The claims were patented (number 330211) for 37.91 acres (Alaska Kardex, 117-007). The property was privately purchased and deeded to the Southeast Alaska Council of the Boy Scouts of America. Children are allowed to collect garnets for free, but adults may only collect garnets after paying a collection fee.

History

Garnet Ledge was discovered and staked in April 1881 by B. Johnson and Phillip Starr in partnership with R.D. Crittenden. By 1893, mineral specimen collectors had begun to purchase separate garnets or garnets still embedded in the schist matrix. From 1881 until January 1, 1907, when the Alaska Garnet Mining and Manufacturing Co. bought the property, several groups of individuals tried and failed to profitably develop the property. The Alaska Garnet Mining and Manufacturing Co. was the first corporation in the world composed entirely of women, and this unique feature helped gain it notoriety (Roppel, 1991). The Alaska Garnet Mining and Manufacturing Co. received a patent on 37.9 acres of land on the second of May, 1913. The company mined and shipped sporadically from 1907 through 1922. That year and in 1926, the property was leased to other parties. By 1936, the company had ceased paying state taxes and had been stricken from the list of corporations doing business in Alaska. Sometime between 1936 and 1962, a Wrangell resident named Fred Hanford acquired the property and deeded it to the Boy Scouts (Roppel, 1991).

In 1893, a Juneau newspaper noted that Wrangell garnets within the original rock matrix were used in the construction of a fountain in San Francisco. Further sales of garnet in the rock matrix took place at the Alaska Yukon Pacific Exposition in Seattle in 1909 and at the Panama Pacific International Exposition in San Francisco in 1915. The only quantity noted was for a shipment of 12 tons to the San Francisco Exposition (Roppel, 1991). The Alaska Garnet Mining and Manufacturing Co. shipped the raw material to Minneapolis, Minnesota where the garnets were cut and made into jewelry such as hatpins and watch fobs. The demand for the jewelry, especially in England, seems to have been more for the nature of a souvenir from Alaska than for the quality of the gem (Roppel, 1991). The waste garnets from the jewelry manufacturing were made into abrasives and later into a patented parting compound for use in metal foundries as a substitute for lycopodium. From 1892, when J.D. Dana published an analysis of the crystals in “Systems of Mineralogy,” until today, slabs of mica schist studded with large garnets or garnets in their freed state are valued mineral specimens or souvenirs of Alaska (Roppel, 1991).

Geology

The Stikine study area has known occurrences of garnetiferous metamorphic rocks including phyllite and crystalline schist (Buddington, 1929). The most significant of these are found within the Wrangell-Revillagigedo Metamorphic Belt, which borders the Coast Range batholith, or are included as bands within the batholith (Buddington, 1929). The following is excerpted from Bressler (1950 p.84, 86).

> The Wrangell garnet deposits lie within the Wrangell-Revillagigedo belt of metamorphic rocks which comprise a complex assemblage of schists, phyllites, and slates that form the western flank of the Coast Range. The trend of this belt is, in general, to the northwesterly trend of the range, and the rocks dip to the northeast. Intricate and highly contorted folds are superimposed on the uniformly trending structures, a condition that makes difficult the determination of the origin and age of these rocks.
>
> Intruded into this metamorphic complex is the Coast Range batholith of probable Jurassic age. ... Numerous peripheral and outlying stocks, dikes, and bosses are thought generally to be genetically related to the batholith. Buddington ... concluded that the core is granodioritic in composition and that the western margin is quartz diorite, whereas the eastern margin is dominantly quartz monzonite. Locally there are many variations in composition ... . Metamorphic and late magmatic effects associated with these large and small intrusions are widespread pronounced and varied. ...
>
> The idioblastic garnet crystals in the schists adjacent to the quartz diorite contact are generally of much larger size and contain innumerable inclusions. ... Because large garnets, commonly containing inclusions and showing no spreading of the micas, are found only adjacent to the intrusive igneous contacts, they are believed to be the result of contact metamorphism caused by the intrusion of the quartz diorite.

The most important garnet deposits lie 750 feet east of the shoreline south of the Stikine River in the ridge lying between the two forks of Garnet Creek. The junction of the two forks is approximately 600 feet from the shoreline. The garnet bearing schist first crops out 60 feet east of the forks junction and becomes covered approximately 500 feet from the junction. An adit is the only underground working, and is located along the southeast fork, approximately 265 feet from the junction of the forks (Bressler, 1950). The adit accesses 260 feet of drifts excavated during the life of the mine. Two open cuts, 100 feet by 4.5 feet by 30 feet, expose the garnetiferous schist (Roppel, 1991).

Conclusions

There will continue to be interest in the utilization of this deposit as a source for mineralogic specimens, but there is not enough interest to support a full-time mining operation (Bressler, 1950). Bressler sampled the garnetiferous schist exposed in the underground workings and examined the garnets after the sampled material was disaggregated. He then determined that the Wrangell garnets meet the requirements set forth by Myers and Anderson in Garnet - Its Mining, Milling, and Utilization: U.S. Bureau of Mines Bulletin 256, 1925 and that their physical properties are analogous to commercial garnets from New Hampshire, which are the acknowledged standards for the abrasive-garnet industry. The Wrangell deposit is limited in size and is relatively remote, which makes it difficult to operate economically as an abrasive source. The possibility exists that there are other metamorphic rocks bearing larger garnets of sufficient grade and of sufficient tonnage to support an economic operation. Because the largest garnets and highest-grade material for use as an abrasive seem to be related to contact metamorphism, exploration should be concentrated near large intrusive bodies.

Table C-7. Summary information for industrial mines, prospects, and occurrences

Table C-7 Summary information for industrial mineral occurrences

Prospect No.	Name MAS No. [ARDF No.]	Latitude Longitude (deg.deg)	Land Status	Deposit Type	Development	Remarks	BLM Work	Select References	MDP	MEP
I4	Wrangell Airport Quarry 0021170006	56.3000 -131.6100	S	Quarry	Active	A primary source of material for construction at Wrangell Airport.	S		H	L
M1	ALACAL 0021160041	56.9300 -134.0700	N	Calcium	NA	NA	NE	Alaska Kardex 116-001C	L	L
M2	Keku Strait Limestone 0021160014	56.9219 -134.1951	OF OF	Calcium	NA	Deposit composed of impure limestone with 11 % insoluble material.	NE	Alaska Kardex 116-026	L	L
M3	Saginaw Bay, west side 0021160069	56.8814 -134.2424	OF	Limestone	NA	Silurian Limestone. 15,000" beach outcrop, 1,000" thick. 25,000,000 tons in 1-mile radius. CaCO3 @ 96.7 %. See LS analysis table for further results.	NE	Roehm 1946	M	M
M4	East Saginaw Bay Limestone 0021160034	56.8700 -134.1600	S	High calcite limestone	NA	Permian Limestone, 1000 ft thick bed of clean limestone. CaC03 @ 96.82 % BLM sample # 99Q3 – see LS Analytical table for full results.	S	B 783	L	L L
M5	Saginaw Bay, east side 0021160068	56.8884 -134.1609	OF	Limestone	NA	Carboniferous age Limestone. 5000' beach outcrop. CaCO3 @ 23.40%.	NE	Roehm 1946	L	L
M6	Jordan Jasper 0021160038	56.8900 -134.0800	OF	Gemstone non precious	NA	NA	NE	Alaska Kardex 116-001H	L	L
M7	Towers Arm 0021170079	56.8158 -133.3249	OF	Limestone	NA	Middle Devonian Limestone. Two miles bluff, beach outcrop. 2,000' est. thickness. 50,000,000 tons estimated in 1-mile radius. CaCO3 @ 93.23 %. See LS analysis table for further results.	NE	Roehm 1946	L	L
M8	Duncan Canal 0021170039	56.5800 -133.1000	OF	Marble	NA	NA	NE	Alaska Kardex 116-044	L	L
M9	Agony 1 & 2 0021170046	56.4600 -133.4300	OF	Gemstones (Agates)	NA	Agates exposed along beach. Reportedly a popular tourist stop.	NE	Alaska Kardex 117-070	L	L
M10	Ruby 1 & 2 0021170044 (aka Garnet Ledge) [PE036]	56.5700 -132.3600	MS 951	Garnet, abrasive	1 adit, 2 cuts	Sporadic commercial production from 1907 to 1922. Sales to mineral collectors were noted in 1893 and continue to today. Property currently owned by and all sales are made through Boy Scouts of America.	NE	Roppel 1991, Bressler 1950	L	L
M11	Lake Virginia 0021170063	56.4700 -132.1500	OF	Stone	NA	Expanse of Gray marble exposed along ridge on the north side of Virginia lake.	NE	Buddington 1923	L	L

Table C-7 Summary information for industrial mineral occurrences

Prospect No.	Name MAS No. [ARDF No.]	Latitude Longitude (deg.deg)	Land Status	Deposit Type	Development	Remarks	BLM Work	Select References	MDP	MEP
M12	Blake Channel 0021170064 [PE044]	56.3600 -132.0200	OF	Marble	NA	Light blue, blue banded with gray, and white marble exposed at tidewater.	NE	Alaska Kardex 117-057, Buchard, 1920	L	L
M13	Ham Island 0021180078 (aka Blake Island)	56.2200 -131.9200	P	Marble	Quarry	Blue coarsely crystalline and fine grained pure white marble. Small production for local use as head stones. CaCO3 @ 60.15% BLM sample #IEWRM4 – see LS Analytical table for full results. Patent 470500 and 541522	S	Alaska Kardex 118-003 Buddington 1923	L	L
M14	Marten Creek 0021180079	56.2200 -131.9000	OF	Dimension stone	NA	Coarse grained gray-blue to dark gray marble.. Some marble nearly white.	NE	Alaska Kardex 118-006 Buddington 1923	L	L
M15	Gorge 0021180035	56.2284 -131.7749	OF	Asbestos	NA	BLM samples analyzed for metals not asbestos; samples to 1,621 ppm Zn in schist and gneiss	S	AK Kardex 118-63	L	L
M16	Kapho Mountain 0021180071 [BC007]	56.2600 -131.6000	OF	Asbestos, also staked as a placer	NA	NA	?	Alaska Kardex 118-088	L	L
M17	Mud Bay 0021170081	56.2300 -132.9900	OF	Limestone	NA	Silurian Limestone. 1500' beach outcrop. 15,000,000 tons in 1-mile radius. CaCO3 @ 95.48%. See LS analysis table for further results.	NE	(Roehm, 1946)	L	L
M18	Piledriver Bay 0021170080	56.2200 -132.9300	OF	Limestone	NA	Silurian Limestone. 2000' beach outcrop. 15,000,000 tons in 1-mile radius. CaCO3 @ 94.6 %. See LS analysis table for further results.	NE	(Roehm, 1946)	L	L
ADL 106690	Cascade Sand & Gravel 0021170202	56.95256 -132.8128	S	Sand & Gravel	Active	Reported annual production of 4,000 cubic yards.	NE	Ak. Div. Of Lands, 2002	H	H
ADL 106528	Critter Enterprises 0021170203	56.5892 -132.3752	S	Sand & Gravel	Active	Reported production of 19,000 cubic yards in previous 2 ½ years.	S	Ak. Div. Of Lands, 2002	H	H