Alaska Resource Data File, Craig quadrangle, Alaska

By Donald J. Grybeck[1]

Open-File Report 2004-1384

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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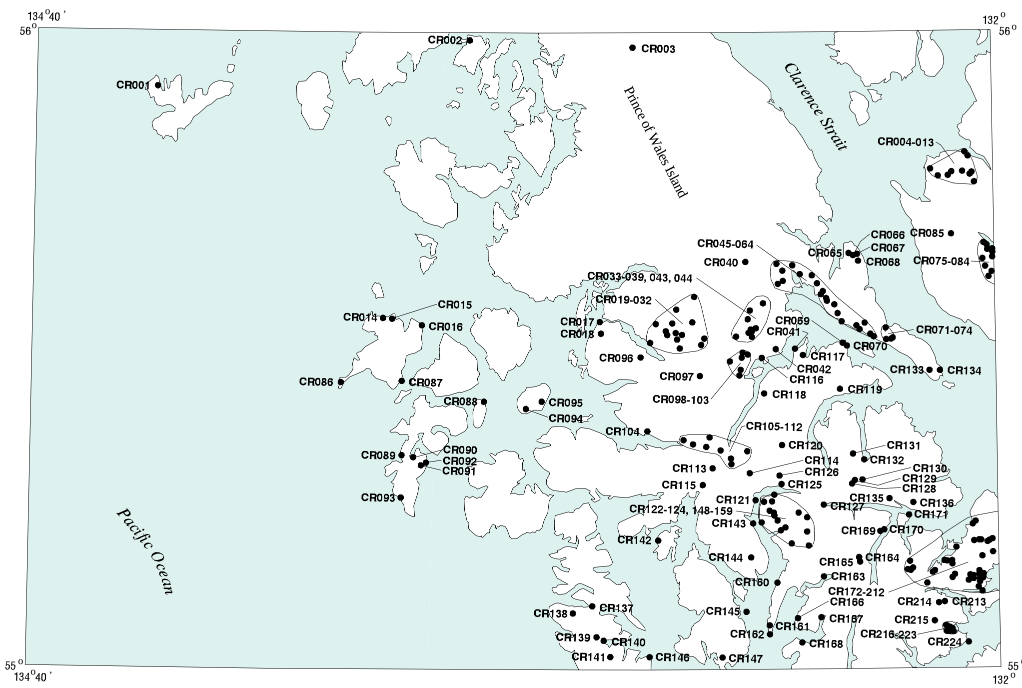
Alaska Resource Data File

Craig quadrangle

Descriptions of the mineral occurrences shown on the accompanying figure follow. See U.S. Geological Survey (1996) for a description of the information content of each field in the records. The data presented here are maintained as part of a statewide database on mines, prospects and mineral occurrences throughout Alaska.



Distribution of mineral occurrences in the Craig 1:250,000-scale quadrangle, Alaska

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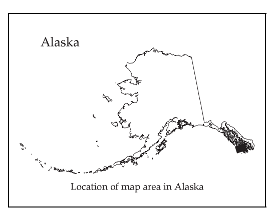

Location of map area in Alaska

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Site name(s): Unnamed (near Pin Peak, Coronation Island)

Site type: Mine

ARDF no.: CR001

Latitude: 55.9129 **Quadrangle:** CR D-7

Longitude: 134.3293

Location description and accuracy:
Several adits are on the east side of Pin Peak at elevations between about 700 and 980 feet. The site is near the center of the area of workings, about 0.2 mile southwest of the center of section 2, T. 69 S., R. 71 E. The location is accurate.

Commodities:

Main: Ag, Au, Pb

Other: Zn

Ore minerals: Cerussite, galena, hydrozincite, limonite, smithsonite, sphalerite, tetrahedrite

Gangue minerals: Calcite

Geologic description:
This mine is in limestone of the Silurian Heceta Limestone (Moerlein and others, 1971-1973; Eberlein and others, 1983; Brew, 1996). A small Cretaceous granitic pluton is nearby. The deposit consists of irregular, scattered masses of galena with sphalerite and tetrahedrite (Wright and Wright, 1908; Twenhofel and others, 1949; Wedow, 1952). Some of the ore was oxidized to limonite, hydrozincite, cerussite, and smithsonite. The maximum dimension of the ore bodies was about 20 feet. The largest was about 8 feet by 12 feet by 18 feet; one 1- to 4-foot-thick body extended for about 100 feet. The deposit was mined from three adits at elevations of about 700 feet, 860 feet, and 980 feet; the underground working total about 800 feet. A sample from the highest adit contained 9.7 percent lead, 0.16 ounce of gold per ton, and 20.8 ounces of silver per ton.

Roppel (1991) presents a detailed history of the development and mining. Galena was discovered in 1900 and ten claims were staked. By 1901, several hundred bags of ore had been mined. A test shipment of 16 tons of ore proved to have a value of $88 per ton in lead and silver. Possibly as much as 400 tons of ore was then shipped. Mining continued intermittently until 1905 when 5 tons of ore was sent to the smelter and another 25 tons of ore was stacked on the beach. The claims were restaked several times until at least 1928 and there were several more small test shipments. Phelps Dodge mapped much of Coronation Island in the early 1970's (Moerlein and others, 1971-1973) and drilled several holes but there is no indication of any significant discovery.

Alteration:
Some of the ore was oxidized to limonite, hydrozincite, cerussite, and smithsonite.

Age of mineralization:
The deposit is younger than the Silurian host rock.

Deposit model:
Galena masses in limestone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Roppel (1991) presents a detailed history of the development and mining. Galena was discovered in 1900 and ten claims were staked. By 1901, several hundred bags of ore had been mined. A test shipment of 16 tons of ore proved to have a value of $88 per ton in lead and silver. Possibly as much as 400 tons of ore was then shipped. Mining continued intermittently until 1905 when 5 tons of ore was sent to the smelter and another 25 tons of ore was stacked on the beach. The claims were restaked several times until at least 1928 and there were several more small test shipments. Phelps Dodge mapped much of Coronation Island in the early 1970's (Moerlein and others, 1971-1973) and drilled several holes but there is no indication of any significant discovery.

Production notes:

Most references indicate that about 100 tons of ore was shipped but there is little information and production may have been higher.

Reserves:

None.

Additional comments:

All of Coronation Island is now a Wilderness Area and is closed to exploration and mining.

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Chapin, 1916; Twenhofel and others, 1949; Wedow and others, 1952; Wedow and others, 1953; Moerlein and others, 1971-1973; Cobb, 1978; Eberlein and others, 1983; Roppel, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908; Roppel, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Tokeen)

Site type: Occurrence

ARDF no.: CR002

Latitude: 55.9881 **Quadrangle:** CR D-5

Longitude: 133.4577

Location description and accuracy:
The exact location of this occurrence is uncertain although it can be placed geologically at the contact between a granitic intrusion and limestone. It is about 0.5 mile southeast of the abandoned town of Tokeen, probably within 0.2 mile of the center of section 11, T. 68 S., R. 77 E.

Commodities:

Main: Pb

Other:

Ore minerals: Galena

Gangue minerals:

Geologic description:
This occurrence consists of a small galena-bearing vein near a contact of a small Cretaceous pluton that intrudes limestone of the Silurian Heceta Limestone (Houston and others, 1958; Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Possibly related to a nearby Cretaceous intrusion.

Deposit model:
Galena-bearing vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Found during geologic mapping.

Production notes:

Reserves:

Additional comments:

References:
Houston and others, 1958; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Houston and others, 1958

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): McCullough; Lake Bay

Site type: Prospect

ARDF no.: CR003

Latitude: 55.9768 **Quadrangle:** CR D-3

Longitude: 133.0020

Location description and accuracy:

The McCullough Mine is about 1.2 miles west of the mouth of Galligan Creek on Gold and Galligan Lagoon; it is about 0.4 mile northwest of the center of section 14, T. 68 S., R. 80 E. The location is accurate. A map of the area and the workings of the mine are shown on figure 71 of Maas and others (1995).

Commodities:

Main: Cu

Other: Ag, Au

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The rocks in the vicinity of the McCullough Mine are mainly graywacke and argillite of the Silurian and Ordovician, Descon Formation (Eberlein and others, 1983; Brew, 1996) The deposit consists of a breccia vein 10 to 15 feet wide that is exposed in workings for about 300 feet (Maas and others, 1995). The vein consists of fragments of graywacke and argillite with pyrite, chalcopyrite, and sphalerite, in a quartz-calcite gangue. The vein has been sampled several times; the copper content typically is 1 to 3 percent (Townsend, 1945, 1946; Herbert and Race, 1965; Maas and others, 1995). Most older analyses show little or no gold, but a recent sample of high-grade material contained 4.39 percent copper, 68 parts per billion (ppb) gold, and 11.9 parts per million silver. A continuous chip sample across 0.9 meter of the vein contained 120 ppb gold (Maas and others, 1995).

The deposit was discovered in 1903 and a 4-ton test sample that contained about 5 percent copper was shipped in 1905 and 1906 (Roppel, 1991) . The workings consist of two shafts, one 71 feet deep, and numerous cuts along the vein. There was intermittent work until 1922 but there was no production. The deposit was restaked in 1929 and the workings were extended from the bottom of the 71-foot shaft. The deposit was examined by Harry Townsend in 1945 for the Anaconda Copper Mining Company. He did some limited exploration trenching and sampling but Anaconda did not acquire the property.

Alteration:

Age of mineralization:

The vein is younger than the Silurian or Ordovician sedimentary host rocks.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

The deposit was discovered in 1903 and a 4-ton test sample that contained about 5 percent copper was shipped in 1905 and 1906 (Roppel, 1991) . The workings consist of two shafts, one 71 feet deep, and numerous cuts along the vein. There was intermittent work until 1922 but apparently no production. The deposit was restaked in 1929 and the workings were extended from the bottom of the 71-foot shaft. The deposit was examined by Harry Townsend in 1945 for the Anaconda Copper Mining Company. He did some limited exploration trenching and sampling but Anaconda did not acquire the property.

Production notes:

Only a 4-ton test shipment in 1905 and 1906.

Reserves:

None.

Additional comments:

References:

Brooks, 1915; Chapin, 1916; Brooks and Capps, 1924; Buddington, 1926; Smith, 1926; Townsend, 1945; Townsend, 1946; Twenhofel and others, 1949; Houston and others, 1958; Cobb, 1978; Herbert and Race, 1965; Eberlein and others, 1983; Roppel, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Roppel, 1991; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Magnetic Point)

Site type: Prospects

ARDF no.: CR004

Latitude: 55.7834 **Quadrangle:** CR D-1

Longitude: 132.1737

Location description and accuracy:

The center of this block of claims is about 1.9 miles west of Mount Burnett and about 0.5 mile east-southeast of the center of section 23, T. 70 S., R. 86 E. The outline of the claim block is shown on Figure 44 of Maas and others (1995).

Commodities:

Main: Fe, Ti

Other: Cr

Ore minerals: Chromite, ilmenite, magnetite

Gangue minerals:

Geologic description:

This block of claims is at the west end of the Union Bay mafic-ultramafic intrusive complex, which outcrops over an area of about 6 x 7 miles (Ruckmick and Noble, 1959). The complex is the largest of numerous small, Cretaceous mafic-ultramafic plutons scattered in a belt along the length of southeastern Alaska (Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

Early workers called attention to magnetite occurrences scattered through the clinopyroxenite and to small pods and lenses of chromite in the dunite, but no deposits of significant size were identified for many years (Budddington and Chapin, 1929; Kennedy and Walton, 1946; Twenhofel, 1953; Kaufman, 1958; Condon, 1961). Columbia Iron Mining Company explored the complex for iron ore from 1954 to 1970 (Noel 1966; Fischer, 1975; Maas and others, 1995). They patented 18 claims in clinopyroxenite at the west end of the complex and identified a resource of about 1 billion tons of material with 18 to 20 percent total iron and about 2 percent titanium. There was at least some diamond drilling on the claims. The magnetite is a primary component of the clinopyroxenite, although at least some was deposited from hydrothermal solutions, probably during emplacment of the complex (Van Treeck and Newberry, 2003).

Alteration:

Age of mineralization:

The magnetite is a primary and hydrothermal component of clinopyroxenite in a Cretaceous mafic-ultramafic complex.

Deposit model:
Magnetite in clinopyroxenite of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
9

Production Status: None

Site Status: Undetermined

Workings/exploration:
Much surface sampling and at least some diamond drilling on the claims.

Production notes:

Reserves:
The deposit has a resource of 1 billion tons of material with a grade of 18 to 20 percent iron and about 2 percent titanium.

Additional comments:

References:
Buddington and Chapin, 1929; Kennedy and Walton, 1946; Twenhofel, 1953; Kaufman, 1958; Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Condon, 1961; Lanphere and Eberlein, 1966; Noel, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: Himmelberg and Loney, 1995; this record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Continental; Chevelle; Cannery Creek

Site type: Prospects

ARDF no.: CR005

Latitude: 55.7724 **Quadrangle:** CR D-1

Longitude: 132.1525

Location description and accuracy:

This site consists of three separate prospects that were first located in 2003. The coordinates are at the Continental prospect, which is the middle and best sampled of the three; it is about 1.1 mile west-southwest of Mount Burnett and about 0.2 mile northeast of the center of section 25, T. 70 S., R. 86 E. The Chevelle prospect is about 0.7 mile northeast of the Continental prospect, and the Cannery Creek prospect is about 1.2 mile southwest of the Continental prospect. The locations of these prospects are known only from a small-scale map on a web page but they are probably accurate to within 0.2 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:

The Continental, Chevelle, and Cannery Creek prospects are in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for the details of exploration in the complex prior to 1995.). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.

freegoldventures.com/s/Home.asp; as of March 1, 2004). The Continental, Chevelle, and Cannery Creek prospects were discovered in 2003 (see CR 006-012 for the others). Detailed geologic data are not available, but, like the other PGE prospects located in the Union Bay mafic-ultramafic complex since 2001, these prospects are in werhlite and magnetite-bearing clinopyroxenite, cut by diopside dikes. Thirteen of the grab samples of magnetite veins, pyroxenite, and wehrlite collected at the Continental prospect contained 3.160 to 14.950 grams of platinum per ton and 0.168 to 0.940 grams of palladium per ton. Preliminary channel sampling at the Continental prospect obtained values of up to 6.2 grams of platinum per ton over 3.3 feet. The results of sampling at the Chevelle prospect have been encouraging, and a zone of copper-, platinum-, and palladium-bearing sulfides was discovered northeast of the mouth of Cannery Creek.

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with magnetite and hornblende alteration formed from 475 to 575 degrees C; and there is a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Only surface sampling and limited channel sampling.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): West Cobra; East Cobra

Site type: Prospects

ARDF no.: CR006

Latitude: 55.7730 **Quadrangle:** CR D-1

Longitude: 132.1248

Location description and accuracy:
The West Cobra prospect, which is at the site selected for this record, is about 0.4 mile south of Mount Burnett and about 0.4 mile east-northeast of the center of section 30, T. 70 S., R. 87 E. The East Cobra prospect is about 1.5 miles east of the West Cobra prospect. The only published location of the Cobra prospects is a small-scale map on a web page, but the site is probably accurate to within 0.2 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:
The Cobra East and West prospects are in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for details of exploration in the complex prior to 1995.) In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). The Cobra prospects were discovered in 2001. While detailed geologic data or sample analyses are not available, the Cobra prospects are similar to the other PGE prospects in the Union Bay mafic-ultramafic complex that have been discovered since 2001 (see, for example, CR004 and CR005).

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Apparently only surface sampling.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Mount Burnett Zone

Site type: Prospect

ARDF no.: CR007

Latitude: 55.7786 **Quadrangle:** CR D-1

Longitude: 132.1146

Location description and accuracy:
The Mount Burnett Zone prospect was found in 2001. It is about about 0.4 mile east of Mount Burnett and about 0.2 mile east of the southwest corner of section 20, T. 70 S., R. 87 E. The location of this prospect is known only from a small-scale map on a web page, but it probably is accurate to within 0.1 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals.

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:
The Mount Burnett Zone is in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for details of exploration in the complex prior to 1995). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). The Mount Burnett Zone was found in 2001 in magnetite clinopyroxenite cut by diopside dikes. Surface samples contained up to 11.5 grams of combined platinum and palladium per ton. Two holes were drilled in 2001 that intersected multiple horizons up to 8.8 feet thick with anomalous PGE values.

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Extensive surface sampling and at least 2 diamond drill holes in 2001.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Alaska Nose

Site type: Prospect

ARDF no.: CR008

Latitude: 55.8095 **Quadrangle:** CR D-1

Longitude: 132.0777

Location description and accuracy:
The Alaska Nose prospect is just above the shoreline, about 0.8 mile south-southeast of Sunshine Island; it is about 0.4 mile west-northwest of the southeast corner of section 9, T. 70 S., R. 87 E.

Commodities:

Main: Ag, Au, Pb, Zn

Other:

Ore minerals: Galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
The Alaska Nose prospect consists of an old trench and a 13-foot shaft that seem to have escaped mention in the literature prior to their location by Maas and others (1993). The deposit consists of two sets of quartz veins in alaskite of Cretaceous age (Brew, 1996). One set of veins strikes N35E and dips 75NW; the other strikes N30W and dips 72NE. Galena, sphalerite, and pyrite occur in and along the margins of the veins which are up to 12 inches thick. A select sample from a well-mineralized portion of a vein contained 237 parts per billion gold, 88 parts per million (ppm) silver, 2,921 ppm zinc, and 2.35 percent lead.

Alteration:

Age of mineralization:
Quartz veins cut Cretaceous alaskite.

Deposit model:
Polymetallic quartz vein (Cox and Singer, 1986, model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
The Alaska Nose prospect consists of an old trench and a 13-foot shaft that seem to have escaped mention in the literature prior to their location by Maas and others (1993).

Production notes:

Reserves:

Additional comments:

References:
Maas and others, 1993; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Vixen Inlet)

Site type: Prospect

ARDF no.: CR009

Latitude: 55.8030 **Quadrangle:** CR D-1

Longitude: 132.0687

Location description and accuracy:

This prospect is at an elevation of about 100 feet near the south shoreline of Vixen Inlet. It about 1.1 mile southeast of Sunshine Island and about 0.5 mile west-northwest of the center of section 15, T. 70 S., R. 87 E.

Commodities:

Main: Ag, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

This prospect consists of two short pits along a creek; the property was active from 1964 through 1967. The deposit consists of numerous barren to slightly mineralized quartz veins that contain minor pyrite and chalcopyrite (Maas and others, 1993, 1995). The veins cut banded, black and green phyllite. Eberlein and others (1983) and Brew (1996) assigned the rocks a Mesozoic or Paleozoic age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous. Several samples taken by Maas and others (1993) contained up to 109 parts per million (ppm) copper and 1.3 ppm silver.

Alteration:

Age of mineralization:

The quartz veins cut possibly Jurassic or Cretaceous phyllite.

Deposit model:

Barren and weakly-mineralized quartz veins.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

This prospect consists of two short pits along the creek; the property was active from 1964 through 1967.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Gehrels and Berg, 1992; Maas and others, 1993; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lexus

Site type: Prospect

ARDF no.: CR010

Latitude: 55.7791 **Quadrangle:** CR D-1

Longitude: 132.0845

Location description and accuracy:

The Lexus prospect was found in 2002. It is about 1.2 miles east of Mount Burnett and about 0.4 mile east of the southwest corner of section 21, T. 70 S., R. 87 E. The location of this prospect is known only from a small-scale map on a web page, but it is probably accurate to within 0.1 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:

The Lexus prospect is in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for details of exploration in the complex prior to 1995). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). The Lexus prospect was found in 2001. While detailed geologic data or sample analyses are not available, the prospect is similar to the other PGE prospects that have been discovered since 2001 in the Union Bay mafic-ultramafic complex (see, for example, CR004-007).

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Apparently only surface sampling.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): North Zone

Site type: Prospect

ARDF no.: CR011

Latitude: 55.7776 **Quadrangle:** CR D-1

Longitude: 132.0584

Location description and accuracy:

The North Zone prospect was found in 2001. It is 2.7 miles east of Mount Burnett and about 0.4 mile east of the northwest corner of section 27, T. 70 S., R. 87 E. The location of this prospect is known only from a small-scale map on a web page, but it is probably accurate to within 0.1 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:

The North Zone prospect is in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for details of exploration in the complex prior to 1995.). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). The first of these new PGE prospects was the North Zone, which was discovered in 2001 in magnetite clinopyroxenite cut by diopside dikes. Significant values have been found at the prospect for a minimum of 400 meters along strike. Several continuous 5-foot-long samples taken at the surface contained 17.3, 6.03, and 3.46 grams of combined platinum and palladium per ton. Four holes have been drilled in the North Zone, two in 2001 and two in 2003, with several intercepts of significant grade of PGE minerals. The best intercept was1.7 feet long and assayed 10.59 grams of platinum per ton and 0.565 grams of palladium per ton.

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Extensive surface sampling and at least 4 diamond drill holes.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Jaguar

Site type: Prospect

ARDF no.: CR012

Latitude: 55.7744 **Quadrangle:** CR D-1

Longitude: 132.0637

Location description and accuracy:

The Jaguar prospect was found in 2002. It is about 2.0 miles east-southeast of Mount Burnett and about 0.4 mile northwest of the center of section 27, T. 70 S., R. 87 E. The location of this prospect is known only from a small-scale map on a web page, but it is probably accurate to within 0.1 mile.

Commodities:

Main: Ir, Os, Pd, Pt, Rh

Other: As, Cr, Fe, Sb

Ore minerals: Chromite, erlichmanite, ferroplatinum, iridosmine, magnetite, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals

Gangue minerals: Diopside, hornblende, magnetite

Geologic description:

The Jaguar prospect is in the Union Bay complex, the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine.

There has been considerable sporadic reconnaissance sampling of the Union Bay complex for magnetite and chromite since at least 1929 and several attempts to locate concentrations of platinum-group-elements (PGE) (See CR013 for the details of exploration in the complex prior to 1995). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported anomalous platinum and palladium in the concentrates. They also identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was in clinopyroxenite and wehrlite on the north side of the complex.

In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). The Jaguar prospect was discovered in 2001 in magnetite clinopyroxenite cut by diopside dikes. The mineralization can be traced for 370 meters along strike with samples that contain up to 3.34 grams of combined platinum and palladium per ton. Two holes were drilled in 2003; several intervals 3.8 to 4.4 feet thick contained 0.934 to 9.450 grams of platinum per ton.

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

An early generation of hydrothermal magnetite associated with diopside dikes formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and secondary hornblende formed between 475 to 575 degrees C; and the last hydrothermal stage, marked by the deposition of of magnetite rimmed by interlayered chlorite and serpentine, formed at less than 475 degrees C.

Age of mineralization:

The PGE deposits are in a Cretaceous mafic-ultramafic complex and they are probably related to its emplacement.

Deposit model:

PGE minerals associated with magnetite in pyroxenites of an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

Extensive surface sampling and at least 2 diamond drill holes.

Production notes:

Reserves:

Additional comments:

References:

Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Lanphere and Eberlein, 1966; Wyllie, 1967; Jackson and Thayer, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Himmelberg and Loney, 1995; Maas and others, 1995; Van Treeck and Newberry, 2003.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Union Bay (near peak 2535)

Site type: Occurrence

ARDF no.: CR013

Latitude: 55.7623 **Quadrangle:** CR D-1

Longitude: 132.0520

Location description and accuracy:

This is a generic site for the entire Union Bay mafic-ultramafic complex, which crops out over an area of about 6 by 7 miles. Many early reports describe the complex and the mineral deposits in it as a single entity. This site is near the center of the dunite core of the complex, where several chromite occurrences have been reported. It is at peak 2535, which is about 0.5 mile north-northeast of the center of section 34, T. 70 S., R. 87 E. Since 2001, there has been considerable exploration of several prospects within the complex for platinum-group elements; these are described separately (CR005-012). In addition, a large block of claims was staked for iron in the the 1960's; the deposit at those claims is described in ARDF record CR004.

Commodities:

Main: Cr, Fe, Ir, Os, Pd, Pt, Rh

Other:

Ore minerals: Chromite, magnetite

Gangue minerals:

Geologic description:

This site includes the entire Union Bay mafic-ultramafic intrusive complex, which outcrops over an area of about 6 by 7 miles. The complex is the largest of numerous small, Cretaceous mafic-ultramafic intrusive bodies scattered in a belt along the length of southeastern Alaska (Ruckmick and Noble, 1959; Lanphere and Eberlein, 1966; Brew and Morell, 1983; Gehrels and Berg, 1992). Many of these plutons are concentrically zoned, an unusual characteristic that has led to their classification as 'Alaska-type,' or 'Alaskan,' complexes (Noble and Taylor, 1960; Taylor and Noble, 1960; Wyllie, 1967; Jackson and Thayer, 1972). As mapped by Ruckmick and Noble (1959) and reinterpreted by Himmelberg and Loney (1995), the Union Bay complex consists of an outer layer of gabbro that is succeeded inward by magnetite clinopyroxenite, wehrlite, and a core of dunite. The dunite forms a vertical pipe about a mile in diameter. It is bordered on the east by narrow, nearly-vertical shells of wehrlite and clinoproxenite, and on the west by a thick, layered sequence of wehrlite, clinopyroxenite, and gabbro that forms either a large recumbent fold or a lopolith. The complex intrudes probably Upper Jurassic and Lower Cretaceous argillite, tuff, and graywacke of the Gravina sequence (Gehrels and Berg, 1992). The bedded rocks are thermally metamorphosed to schist and gneiss for about 1,000 feet from the intrusive contact. Himmelberg and Loney (1995) suggest that the complex was emplaced during the last stages of Cretaceous regional folding, when the dunite underwent plastic deformation that resulted in a preferred orientation of the olivine. Clark and Greenwood (1972 [PP 800-C, p. C21-27]) report a major increase in the volume of the dunite core due to its serpentinization.

Early workers called attention to magnetite scattered through the clinopyroxenite and to small pods and lenses of chromite in the dunite, but no deposits of significant size were identified prior to the 1960's (Budddington and Chapin, 1929; Kennedy and Walton, 1946; Twenhofel, 1953; Kaufman, 1958; Condon, 1961). Columbia Iron Mining Company searched for iron ore in the area from 1954 to 1970 (Noel 1966; Fischer, 1975; Maas and others, 1995). They patented 18 claims at the west end of the complex (CR004), and identified a resource of about 1 billion tons of material with 18 to 20 percent total iron and about 2 percent titanium. Clark and Greenwood (1972 [PP 800-C, p. C157-160]) carried out the first systematic survey to ascertain the platinum-group-element (PGE) content of the complex from 50 samples they collected of the various rocks. Their samples averaged 0.093 part per million (ppm) platinum and 0.023 ppm palladium; the maximum value was 1,600 ppm platinum, 0.200 ppm palladium, 0.062 ppm rhodium, and 0.215 ppm iridium. Anaconda Minerals did a reconnaissance survey of the complex but concluded there was no likelihood of an economic platinum-group-element deposit in it (Anaconda Collection, American Heritage Center, University of Wyoming, files 6804.01, 7503.09, and 7503.12). In the early 1990's, Maas and others (1995) collected placer samples in several streams on the north side of the complex and reported considerable anomalous platinum and palladium in the concentrates. They identified ferroan platinum, native osmium, osmium-iridium, and hollingworthite (a rhenium-platinium-palladium arsenide) in the concentrates and suggested that the source was the clinopyroxenite and wehrlite on the north side of the complex. In 2000, Freegold Ventures Limited began exploring for PGE in the complex and they have located a number of prospects that they are currently working on in a joint venture with Lonmin PLC (www.freegoldventures.com/s/Home.asp; March 1, 2004). These prospects are described in detail as separate sites (CR005-012).

Van Treeck and Newberry (2003) studied these PGE deposits in detail and concluded that the PGE minerals are hydrothermal in origin and are associated with veins and lenses of magnetite that cut the mafic and ultramafic rocks of the complex. An early generation of hydrothermal magnetite associated with diopside dikes was formed from 575 to 700 degrees C; the PGE minerals are associated with an intermediate stage of hydrothermal activity marked by the deposition of magnetite and hornblende alteration that occurred between 475 to 575 degrees C; and a later generation of magnetite rimmed by interlayered chlorite and serpentine formed at less than 475 degrees C. They identified the following PGE minerals: ferroplatinum, erlichmanite, iridosmine, platiniridium, and several unnamed rhenium-arsenic-sulfur, rhenium-iron, platinum-antimony, and platinum-iridium-sulfur minerals. The source of the hydrothermal fluids is unknown but the absence of quartz suggests that the fluids are related to the mafic and ultramafic rocks.

Alteration:

Most of the early workers did not specifically note alteration apart from that associated with the intrusion of the complex. See CR005-012 for a modern interpretation of the alteration associated with the PGE deposits currently (2004) being explored in the complex.

Age of mineralization:

Chromite, magnetite, and PGE associated with the emplacement of a Cretaceous mafic-ultramafic complex.

Deposit model:

Chromite, magnetite, and PGE associated with an Alaska-type mafic-ultramafic complex (Cox and Singer, 1986; model 9).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

9

Production Status: None

Site Status: Active

Workings/exploration:

The Union Bay mafic-ultramafic complex has been sampled sporadically by government and industry geologists and engineers since at least the 1930's for chromite, magnetite, and platinum-group-elements. However, the sampling was more reconnaissance than systematic in nature until exploration of the complex for PGE began in 2001. The work on the several prospects that are currently (2004) being explored (CR004-007 and CR010-012) includes systematic outcrop sampling and diamond drilling.

Production notes:

Reserves:

In the 1960s, a resource of 1 billion tons of material that contains 18 to 20 percent iron and about 2 percent titanium was identified near the west end of the complex.

Additional comments:

References:

Buddington and Chapin, 1929; Kennedy and Walton, 1946; Glover, 1951; Twenhofel, 1953; Holdsworth, 1954; Kaufman, 1958; Ruckmick and Noble, 1959; Noble and Taylor, 1960; Taylor and Noble, 1960; Condon, 1961; Lanphere and Eberlein, 1966; Noel, 1966; Taylor, 1967; Wyllie, 1967; Taylor, 1969; Jackson and Thayer, 1972; Clark and Greenwood, 1972 (PP 800-C, p. C21-C27); Clark and Greenwood, 1972 (PP 800-C, p. C157-160); Murray, 1972; Fischer, 1975; Brew and Morell, 1983; Gehrels and Berg, 1992; Cannon, 1993; Himmelberg and Loney, 1995; Maas and others, 1995.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on north end of Noyes Island)

Site type: Prospect

ARDF no.: CR014

Latitude: 55.5517 **Quadrangle:** CR C-6

Longitude: 133.6953

Location description and accuracy:

The location of the camp for this diamond drilling site is at an elevation of about 100 feet on the west side of the small creek on the north end of Noyes Island, in the SW1/4 section 10, T. 73 S., R. 77 E. The location of the actual drilling is unknown; it is perhaps on the ridge west of the camp.

Commodities:

Main: Cu, Mo

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

The remains of a small drilling camp tucked into the timber on the east side of a small creek on the north end of Noyes Island was pointed out to D.J. Grybeck by Ken Eichner (D.J. Grybeck, unpublished field notes, 1984). The area was already overgrown and it was barely possible to land at an old helicopter pad nearby. The camp was said to date from the early 1970's. A pile of about 20 core boxes remained at the camp, each with about 10 feet of thin core. The core was thoroughly mixed up and the boxes had largely disintegrated. The numbering system suggests at least 6 holes.

Most of core consists of hornfelsed meta-andesite with sparse to moderate amount of pyrrhotite and some chalcopyrite as disseminated grains, in thin quartz veins, and along fractures. The core included a substantial amount of moderately to weakly altered, quartz monzonite with notably large sericite grains along fractures, and sparse disseminated pyrite. Four typical samples of the mineralized quartz monzonite and meta-andesite from the core pile contained 150-300 parts per million (ppm) copper; two contained 5-15 ppm molybdenum, and all contained less than 0.05 ppm gold. The location of the drill sites is unknown but there is a large, vividly orange-stained zone across the creek to the west that is exposed in a landslide and several similar patches can be seen scattered through the timber. The drill sites may be in this area.

Alteration:

Hornfelsing of meta-andesite and moderate sericitic alteration of quartz monzonite.

Age of mineralization:

Probably Cretaceous based on the age of most of the small granitic plutons nearby (Eberlein and others, 1983; Brew, 1996).

Deposit model:

Porphyry copper or porphyry molybdenum.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:
Possibly six holes were diamond drilled in the early 1970's.

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Brew, 1996.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on Noyes Island); Brown and Metz

Site type: Prospect

ARDF no.: CR015

Latitude: 55.5507 **Quadrangle:** CR C-6

Longitude: 133.6701

Location description and accuracy:
The location of these prospects is known no more closely than at the north end of Noyes Island. The site is arbitrarily plotted in about the center of the SW1/4 section 11, T. 73 S., R. 77 E.

Commodities:

Main: Cu, Mo

Other:

Ore minerals: Chalcopyrite, molybdenite, pyrrhotite

Gangue minerals:

Geologic description:
Wright and Wright (1908) note that chalcopyrite and pyrrhotite occur at some unspecified location on the north end of Noyes Island near the contact of a granitic body. An analysis of pyrrhotite from what they call the the Brown and Metz prospect showed 0.1 to 0.2 percent nickel, and a trace of cobalt. Buddington and Chapin (1929) note a molybdenum occurrence at some unspecified location on the north end of Noyes Island. The rocks on the north end of Noyes Island consist of a small Cretaceous pluton that intrudes basaltic to andesitic rocks of the Descon Formation of Silurian and Ordovician age (Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:
Wright and Wright, 1908; Buddington and Chapin, 1929; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908; Buddington and Chapin, 1929

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (at northeast end of Noyes Island)

Site type: Occurrence

ARDF no.: CR016

Latitude: 55.5407 **Quadrangle:** CR C-5

Longitude: 133.5877

Location description and accuracy:
This occurrence is accurately located near the northeast tip of Noyes Island, about 0.3 mile east of the center of section 17, T. 73 S., R. 78 E.

Commodities:

Main: Ag, Pb, Zn

Other:

Ore minerals: Galena?, sphalerite?

Gangue minerals: Quartz

Geologic description:
Maas and others (1991) sampled an outcrop of brown-stained, silicified limestone on the beach. A 0.5-foot-thick quartz vein in it contained 21.7 parts per million silver, 0.89 percent lead, and 1.08 percent zinc. The limestone is probably part of the Karheen Formation of Devonian age (Eberlein and others, 1983; Brew, 1996).

Alteration:
Silicification of limestone.

Age of mineralization:
The vein is in Devonian rocks.

Deposit model:
Quartz vein with lead, silver, and zinc values.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only limited surface sampling.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of Klawock)

Site type: Occurrence

ARDF no.: CR017

Latitude: 55.5462 **Quadrangle:** CR C-4

Longitude: 133.0950

Location description and accuracy:

This occurrence is on the east side of the Klawock-Craig road, just south of the bridge at the south end of Klawock. It is near the northwest corner of section 15, T. 73 S., R. 81 E. The site is at a quarry that is labeled on the USGS 1:63,360-scale topographic map.

Commodities:

Main: Ag

Other: Au, Cu, Pb, Zn

Ore minerals: Arsenopyrite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:

As exposed in 1991 (D.J. Grybeck, unpublished field notes, 1991), the site was in a large quarry. The walls of the quarry consisted mostly of excellent exposures of folded and metamorphosed calcareous sandstone and siltstone with minor limestone of the Klawak Formation of Pennsylvanian age (Churkin and Eberlein, 1975). Thick, probably post-metamorphic, hornblende latite- to dacite-porphyry dikes generally parallel the north-south trend of the sedimentary rocks. Locally, small skarn bodies with garnet, epidote, and diopside (?), and banded skarn are developed in calcareous horizons. No obviously plutonic rocks were exposed in the quarry but the pronounced metamorphic effects (and the dikes?) are probably related to a Permian syenite body which is exposed just a few hundred yards to the south along the Klawock-Craig road (Churkin and Eberlein, 1975). Two quartz veins 6 to 8 inches thick with moderate sulfides including arsenopyrite, pyrite, and pyrrhotite, cut the skarn. There is little indication of significant quantities of metals in the quarry but it represents a distinct type of mineral deposit that may occur elsewhere in the area. A subsequent visit several years later found that the quarry had been expanded and little outcrop remained. Maas and others (1991) also examined the quarry but did not find any significant mineralization. Their samples contained up to 20 parts per billion gold, 1.9 part per million (ppm) silver, 182 ppm copper, 130 ppm lead, and 400 ppm zinc.

Alteration:

Garnet-epidote-diopside skarn developed in carbonate rocks.

Age of mineralization:

Skarn and a few quartz veins are probably related to nearby Permian syenite.

Deposit model:

Quartz veins and skarn related to nearby syenite (Cox and Singer, 1986; model 18c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18c

Production Status: None

Site Status: Undetermined

Workings/exploration:
The site is a large industrial rock quarry. The Sealaska Corporation holds the subsurface rights to the land in the vicinity.

Production notes:

Reserves:

Additional comments:
The subsurface rights to the area is held by the Sealaska Native Corporation.

References:
Churkin and Eberlein, 1975; Maas and others, 1991; Maas and others, 1995.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of Klawock)

Site type: Occurrence

ARDF no.: CR018

Latitude: 55.5280 **Quadrangle:** CR C-4

Longitude: 133.0913

Location description and accuracy:

This site represents an area of about one-quarter square mile about 1.8 mile south of the town of Klawock. The area covers most of the NW1/4 section 22, T. 73 S., R. 81 E., and the site is in the center of that area.

Commodities:

Main: Ag, As, Au, Bi, Cu, Mn, Pb

Other:

Ore minerals: Chalcopyrite, galena, pyrrhotite

Gangue minerals: Epidote, garnet, quartz

Geologic description:

This site consists of several small occurrences of similar mineralization in an area of about a quarter square mile; the deposits are exposed along logging roads in an area that is largely covered by forest and surficial deposits. The rocks consist mainly of a thick section of Paleozoic strata (Churkin and Eberlein, 1975). They include the Klawak Formation of Pennsylvanian age, which consists largely of calcareous sandstone, siltstone, and limestone, and the Peratrovich Formation, which at this site consists largely of limestone and cherty limestone.

Several deposits have been identified in the area, some perhaps the same deposit described by different geologists. D.J. Grybeck (unpublished field data, 1991) found pyritiferous sandstone of the Klawock Formation that was bleached and iron stained for about 40 feet along a logging road. The zone contains a lens about 12 inches thick of massive pyrrhotite with minor chalcopyrite and a silicified border zone. A sample of the massive pyrrhotite contained up to 300 parts per million (ppm) silver, 200 ppm arsenic, 150 ppm bismuth, and 3,000 ppm copper Erratic, small patches of calc-silicate minerals with garnet and small, rusty gossan zones occur along the logging road for several hundred yards to the northwest. A grab sample of one of the more prominent gossans contained 7 ppm silver and 700 ppm copper.

Hedderly-Smith (1999 [Inventory]) describes several other (or the same) occurrences that were found in 1988 as logging roads were built in the area. Two 1.5-foot-thick stratiform veins or replacement lenses of massive pyrrhotite are separated by 6 feet of ferricrete. Samples contained up to 0.3 percent copper, 1,270 ppm lead, and 3.12 ounces of silver per ton. The deposit strikes about N20E and dips 60W. About 10 feet south of the pyrrhotite lenses, minor galena occurs in a quartz-sulfide vein. About 0.1 mile northwest near a rock pit, samples of mineralized float contained more than 1 percent lead, 1.2 percent zinc, and more than 50 ppm silver. Another sample of chert-carbonate rock adjacent to a felsic dike contained 656 ppm lead, 454 ppm copper, 6.2 ppm silver, 4.66 percent manganese, 16.94 percent iron, 1.38 percent arsenic, and 271 parts per billion gold. Hedderly-Smith indicates that these deposits were first thought to be massive-sulfide deposits but later concluded that they are skarn deposits. There are no intrusions in the immediate area but there may be buried or concealed bodies similar to Permian syenite exposed about a mile to the north that may be the source of these deposits (Churkin and Eberlein, 1975).

Alteration:

Small lenses and masses of skarn developed in limestone; silicification adjacent to pyrrhotite lens; disseminated pyrite in calcareous sandstone.

Age of mineralization:
Unclear. These small and erratically distributed deposits are no older than their Mississippian and Pennsylvanian host rocks. There are no intrusions in the immediate area but there may be buried or concealed bodies similar to the Permian syenite exposed about a mile to the north that may be the source of these deposits (Churkin and Eberlein, 1975).

Deposit model:
Small erratic veins, pyrrhotite lenses, and quartz veins.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:
Only sampling by government and industry geologists.

Production notes:

Reserves:

Additional comments:
The Sealaska Corporation holds the subsurface rights to the land in the vicinity.

References:
Churkin and Eberlein, 1975; Hedderly-Smith, 1999 (Inventory).

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Klawock Lake)

Site type: Occurrence

ARDF no.: CR019

Latitude: 55.5134 **Quadrangle:** CR C-3

Longitude: 132.9555

Location description and accuracy:
This occurrence consists of bright yellow- and orange-stained rocks in outcrops on the north side of the road from Hollis to Klawock; it is in the center of section 28, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Ba, Cu

Other:

Ore minerals: Pyrite

Gangue minerals:

Geologic description:
This occurrence consists of several prominent orange- and yellow-stained exposures 225-300 feet long along roadcuts (D.J. Grybeck, unpublished field notes, 1984). The rocks consist of felsic to intermediate metamorphosed tuffs and and porphyritic intermediate volcanic rocks of the Luck Creek Breccia of Silurian and Ordovician age (Eberlein and others, 1983). The oxidized rocks locally contain several percent disseminated pyrite and display a little copper carbonate staining. Several chip samples across the exposures contained up to 2 parts per million (ppm) silver, 2,000 ppm barium, and 5,000 ppm copper. Several samples from similar bright orange and yellow outcrops along the road about two miles to the southeast had no significant metal values.

Alteration:
The outcrops are are oxidized and brightly stained orange and yellow.

Age of mineralization:

Deposit model:
Metalliferous, volcanogenic(?) layers in Silurian and Ordovician, metamorphosed volcanic and sedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:
Only surface sampling by government geologist in outcrops beside the road.

Production notes:

Reserves:

Additional comments:
The Sealaska Corporation holds the subsurface rights to the land in the vicinity of this occurrence.

References:
Eberlein and others, 1983.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (in upper Three Mile Creek)

Site type: Occurrence

ARDF no.: CR020

Latitude: 55.5429 **Quadrangle:** CR C-3

Longitude: 132.9395

Location description and accuracy:

This occurrence is along a logging road at an elevation of about 1,800 feet, about 1.4 miles southwest of peak 3640. It is in about the center of the NW1/4 section 15, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Au, Cu

Other: As

Ore minerals: Arsenopyrite

Gangue minerals: Quartz

Geologic description:

The occurrence consists of an arsenopyrite-quartz vein about 18 inches thick that cuts argillite of the Luck Creek Breccia of Silurian and Devonian age (Hedderly-Smith and Glavinovich, 1991; D.J. Grybeck, unpublished field notes, 1984). The vein is mainly quartz but a layer about 1.5 inches thick has about 10 percent sulfides, mainly arsenopyrite. Samples contained 0.46 percent copper and up to 17 parts per million (ppm) silver and 1.390 ppm gold. The deposit may be related to a nearby or buried Cretaceous granitic intrusion (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Possibly related to a nearby or buried Cretaceous granitic intrusion.

Deposit model:

Polymetallic vein (Cox and Singer, 1986, model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status:

Site Status:

Workings/exploration:

Production notes:

Reserves:

Additional comments:

The Sealaska Corporation holds the subsurface rights to the land in the vicinity of this occurrence.

References:

Hedderly-Smith and Glavinovich, 1991; Hedderly-Smith, 1989; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith and Glavinovich, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Saxe

Site type: Prospect

ARDF no.: CR021

Latitude: 55.5256 **Quadrangle:** CR C-3

Longitude: 132.9081

Location description and accuracy:
The Saxe is an old prospect that has not been described in a primary reference since 1926 and that reference lacks a detailed location. It is probably within a mile of the center of section 23, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Au, Co, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, pyrrhotite, sphalerite

Gangue minerals: Carbonates, quartz

Geologic description:
The deposit at the Saxe prospect consists of a quartz-carbonate vein 2 feet thick and quartz stringers in andesite-porphyry breccia of the Silurian and Ordovician Descon Formation (Buddington, 1926; Eberlein and others, 1983; Brew, 1996). The veins and stringers contain abundant galena, pyrite, and sphalerite, traces of chalcopyrite, up to 0.07 ounce of gold per ton, and 1.96 ounces of silver per ton. The rock between the stringers contains disseminated pyrite and many fractures are filled with quartz and pyrrhotite. The workings consists of a small cut about 10 feet wide. There is no record of production.

Alteration:

Age of mineralization:
Unknown, other than that the vein cuts Silurian or Ordovician rocks.

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Inactive

Workings/exploration:
Only a 10-foot-wide cut.

Production notes:

Reserves:

Additional comments:

The land in the vicinity of this old prospect has been identified for possible selection by the Sealaska Corporation.

References:

Buddington, 1926; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Buddington, 1926

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (in upper Three Mile Creek)

Site type: Occurrence

ARDF no.: CR022

Latitude: 55.5316 **Quadrangle:** CR C-3

Longitude: 132.9120

Location description and accuracy:
This occurrence is at an elevation of about 1,650 feet about 0.6 mile west-southwest of peak 3450 and about 0.5 mile north-northwest of the center of section 23, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other: As

Ore minerals: Arsenopyrite?, galena?, sphalerite?

Gangue minerals: Quartz

Geologic description:
Samples from a quartz-sulfide vein and breccia float contained 0.19 percent copper, 2.1 percent lead, 2.6 percent zinc, 579 parts per million (ppm) arsenic, 52.9 ppm silver, and 0.65 ppm gold (Hedderly-Smith and Glavinovich, 1991). The vein is in metamorphosed volcanic and sedimentary rocks of the Luck Creek Breccia of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). Possibly related to a nearby or buried Cretaceous granitic intrusion.

Alteration:

Age of mineralization:
Possibly related to a nearby or buried Cretaceous granitic intrusion.

Deposit model:
Polymetallic vein (Cox and Singer, 1986, model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only sampling by industry geologists.

Production notes:

Reserves:

Additional comments:
The land in the vicinity of this occurrence has been identified for possible selection by the Sealaska Corpo-

ration.

References:

Eberlein and others, 1983; Hedderly-Smith and Glavinovich, 1991; Hedderly-Smith, 1989; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Brew, 1996; Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith and Glavinovich, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (southeast of Black Bear Lake)

Site type: Occurrence

ARDF no.: CR023

Latitude: 55.5438 **Quadrangle:** CR C-3

Longitude: 132.8939

Location description and accuracy:
Several mineral occurrences are in a large, geochemically anomalous area that includes all of the N1/2 of sections 13 and 14, T. 73 S., R. 82 E. The coordinates are at about the center of this area, which is about 1.8 mile southwest of the outlet of Black Bear Lake.

Commodities:

Main: Cu, Mo

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
Several mineral occurrences are scattered over an area of about one square mile that is marked by strong geochemical anomalies (Hedderly-Smith, 1999 [Inventory]). The rocks in the area consist of metamorphosed volcanic and sedimentary rocks of the Luck Creek Breccia of Silurian and Ordovician age that have been intruded by small (Cretaceous?) granodiorite bodies (Eberlein and others, 1983; Brew, 1996). The rocks show local propylitic and phyllic alteration. Samples of hornfelsed and pyritized rocks contained up to 1,237 parts per million (ppm) copper; samples of molybdenite-bearing quartz-sulfide veins contained up to 1,517 ppm copper and 1,529 ppm molybdenum. The geochemical anomalies and mineral occurrences suggest a buried porphyry-copper deposit.

Alteration:
Hornfelsing and local propylitic and phyllic alteration.

Age of mineralization:
Possibly related to a buried Cretaceous intrusion.

Deposit model:
Buried porphyry copper deposit?

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Production notes:

Reserves:

Additional comments:
The Sealaska Corporation either holds the subsurface rights to the land around this occurrence or it has been identified for possible selection by them.

References:
Eberlein and others, 1983; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Black Lake)

Site type: Occurrences

ARDF no.: CR024

Latitude: 55.5654 **Quadrangle:** CR C-3

Longitude: 132.8827

Location description and accuracy:
This occurrence is at an elevation of about 500 feet, about 0.7 mile north-northwest of the outlet of Black Bear Lake. It is near the center of the SW1/4 section 1, T. 73 S., R. 82 E. This site includes another occurrence about 0.2 mile to the south in a quarry shown by symbol on the USGS 1:63,360-scale topographic map; it is about 0.5 mile south-southwest of the center of section 1, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Au, Cu, Mo

Other: W

Ore minerals: Chalcopyrite, molybdenite, pyrite

Gangue minerals: Quartz

Geologic description:
This occurrence, discovered in 1988, is what was originally interpreted as a vertical, roughly elliptical, breccia pipe about 600 feet long and 300 feet wide (Hedderly-Smith and Glavinovich, 1991; Maas and others, 1991; Hedderly-Smith, 1999 [Inventory]). Later work by Hedderly-Smith indicates that the occurrence may not be a vertical pipe but instead is a northeast-trending breccia zone along a fault. The occurrence is at or near the contact between a Cretaceous granitic pluton and metamorphosed volcanic and sedimentary rocks of the Luck Creek Breccia of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). The breccia is composed of intensely altered clasts of diorite in a quartz-pyrite matrix; the breccia contains minor chalcopyrite and molybdenite. Three samples collected by Hedderly-Smith (1991) contained up to 0.07 percent copper, 0.064 percent molybdenum, 0.06 percent tungsten, and 0.03 ounce of gold per ton. Samples taken by Maas and others (1991) of material with masses of pyrite up to 6 inches across contained up to 23 parts per billion gold, 2.5 parts per million (ppm) silver, 0.53 percent copper, and 101 ppm molybdenum. Aerial photographs indicate that several arcuate structures surround the breccia. Ground geophysical surveys show that the electric response of the breccia is weak, but show an anomalous zone downslope from the breccia.

Alteration:
The diorite clasts in the breccia are intensely altered.

Age of mineralization:
The breccia is probably related to the contact of a Cretaceous granitic pluton.

Deposit model:
Breccia zone with chalcopyrite and molybdenite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only surface sampling by geologists from government and private industry.

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Hedderly-Smith, 1989; Hedderly-Smith and Glavinovich, 1991; Maas and others, 1991; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1994 (Black Lake); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Constitution

Site type: Prospect

ARDF no.: CR025

Latitude: 55.5853 **Quadrangle:** CR C-3

Longitude: 132.8330

Location description and accuracy:

The location of this prospect is uncertain. It is known only from a small map in Wright and Wright (1908) that is nearly impossible to reconcile with modern topographic maps. For this record, the site is about 4.9 miles west of the mouth of the creek that enters the west end of Salmon Lake. It is at an elevation of about 2,000 feet, about 0.5 mile west-northwest of the center of section 34, T. 72 S., R. 82 E. The actual location of the prospect, however, may be several miles or more from this site.

Commodities:

Main: Au?, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

This deposit consists of a quartz vein containing pyrite, chalcopyrite, galena, and sphalerite (Wright and Wright, 1908). The vein is 6 inches to 4 feet wide, strikes N65W, and dips 60 W to vertical. It cuts gabbro and amphibolite that may be part of a large Cretaceous intrusion near Pin Peak (Eberlein and others, 1983; Brew, 1996). A tunnel at an elevation of about 2,000 feet is 130 feet long.

Alteration:

Age of mineralization:

Deposit model:

Polymetallic vein? (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c?

Production Status: None

Site Status: Inactive

Workings/exploration:

The only working is a 130-foot tunnel.

Production notes:

Reserves:

Additional comments:

The prospect is probably in the Karta River Wilderness, which is closed to prospecting and mining.

References:

Brooks, 1902; Wright and Wright, 1908; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of Black Bear Lake)

Site type: Occurrence

ARDF no.: CR026

Latitude: 55.5287 **Quadrangle:** CR C-3

Longitude: 132.8846

Location description and accuracy:
This occurrence is at an elevation of about 3,200 feet, about 0.7 mile south-southwest of peak 3996 . It is about 0.2 mile north-northwest of the center of section 24, T. 73 S., R. 82 E.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other: As

Ore minerals: Galena, sphalerite

Gangue minerals: Quartz

Geologic description:
At this occurrence, Hedderly-Smith and Glavinovich (1991) sampled a 3-inch-thick quartz-sulfide vein. The sample contained 0.16 percent copper, 0.40 percent lead, 2.08 percent zinc, 0.72 percent arsenic, 63.4 parts per million (ppm) silver, and 2.13 ppm gold. The sulfides are not identified but based on the analysis, the main ore minerals are probably galena and sphalerite. The rocks in the area are mainly Silurian or Ordovician metavolcanic and metasedimentary rocks of the Descon Formation. The deposit is possibly related to a Cretaceous diorite and granodiorite pluton to the north (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Unknown; possibly related to a Cretaceous diorite and granodiorite pluton to the north (Eberlein and others, 1983; Brew, 1996).

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only sampling by private geologists.

Production notes:

Reserves:

Additional comments:

The land in the vicinity of this occurrence has been identified for possible selection by the Sealaska Corporation.

References:

Hedderly-Smith, 1989; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith and Glavinovich, 1991; Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith and Glavinovich, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near head of Harris River)

Site type: Occurrences

ARDF no.: CR027

Latitude: 55.5185 **Quadrangle:** CR C-3

Longitude: 132.8807

Location description and accuracy:

This record describes several occurrences in an area about a mile square that covers the S1/2 section 24 and N1/2 section 25, T. 73 S., R. 82 E. The site is plotted at about the center of the area, about 0.8 mile northeast of peak 3332.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other: As, Bi, Sb

Ore minerals: Pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:

Hedderly-Smith (1999 [Inventory]) describes several mineral occurrences in a mile-square area marked by widespread geochemical anomalies. The rocks in the area consist of metamorphosed volcanic and sedimentary rocks of the Luck Creek Breccia of Silurian or Ordovician age that have been intruded by several quartz monzonite sills and dikes. The rocks may form the roof of a buried qranodiorite-quartz monzonite intrusion. They commonly are fractured, cut by quartz-pyrite veinlets, and have disseminated pyrite. A float sample of a 3-inch-wide piece of quartz-pyrite vein contained 4,551 parts per million (ppm) copper, 903 ppm lead, 50 ppm arsenic, 39 ppm bismuth, 50.8 ppm silver, 1.535 ppm gold, and 324 ppm antimony. A sample from a steeply-dipping, 3-foot-thick pyrite-pyrrhotite vein contained 4,102 ppm copper, 890 ppm zinc, and 2.1 ppm silver.

Alteration:

Age of mineralization:

Related to a nearby or buried Cretaceous granitic pluton.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

Production notes:

Reserves:

Additional comments:

The land in the vicinity of these occurrences has been identified for possible selection by the Sealaska Corporation.

References:

Hedderly-Smith, 1992 (Harris River); Hedderly-Smith, 1992 (1992 season); Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near head of Harris River)

Site type: Occurrences

ARDF no.: CR028

Latitude: 55.5257 **Quadrangle:** CR C-3

Longitude: 132.8672

Location description and accuracy:
This site is the center of an area of anomalous geochemical samples in which several rock samples with substantial metal values were collected. The area includes the NE1/4 and N1/2SE1/4 section 24, T. 73 S., R. 82 E., and the W1/2 section 19, T. 73 S., R. 83 E. For this record, the site is about 1.0 mile south-southwest of the south end of Black Bear Lake, at the midpoint of the boundary between sections 19 and 24.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other: As, Bi, Mo

Ore minerals:

Gangue minerals: Quartz

Geologic description:
The rocks in this geochemically anomalous area are mainly metamorphosed andesite of the Luck Creek Breccia of Silurian and Ordovician age that has been intruded by (Cretaceous?) granodiorite and quartz monzonite, and siliceous felsic dikes (Eberlein and others, 1983, Brew, 1996; Hedderly-Smith, 1999 [Inventory]). The area has several mineral occurrences. A northwest-sriking, steeply-dipping quartz-sulfide vein 8 inches to 5 feet thick cuts the andesite; samples contained up to 3,421 parts per million (ppm) copper, 9,918 ppm lead, 986 ppm silver, 0.470 ppm gold, 682 ppm arsenic, and 124 ppm bismuth. Other samples collected nearby of quartz veins and stockworks contained up to 248 ppm copper, 24 ppm molybdenum, 3,218 ppm zinc, 19.4 ppm silver, and 1.07 ppm gold. The andesite commonly is chloritized and bleached adjacent to the quartz-sulfide veins. Hedderly-Smith suggests that this is the upper propylitic zone of a copper porphyry deposit.

Alteration:
Andesite commonly is chloritized and bleached adjacent to the quartz-sulfide veins.

Age of mineralization:
Probably related to a buried Cretaceous(?) granitic intrusion.

Deposit model:
Polymetallic vein; buried porphyry copper deposit? (Cox and Singer, 1996; model 22c or 17).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
17?, 22c

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only surface sampling by private industry.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Hedderly-Smith, 1992 (1992 season); Hedderly-Smith, 1993 (1992 season); Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of upper Harris River)

Site type: Prospect

ARDF no.: CR029

Latitude: 55.5046 **Quadrangle:** CR C-3

Longitude: 132.8736

Location description and accuracy:

This is the site of a hole that was diamond drilled in the early 70's. There were probably several more holes in the vicinity, and this site is at about the center of a block of claims explored by those holes that covered at least a square mile. The site is about 0.6 mile south-southeast of the center of section 25, T. 73 S., R. 82 E., and about 0.6 mile due east of peak 3344.

Commodities:

Main: Ag, Au, Cu, Mo, Pb, Zn

Other:

Ore minerals: Pyrite

Gangue minerals:

Geologic description:

This prospect is at the pad of a diamond drill hole put down by AlVenCo, Inc. in the early 1970's There is at least one other hole nearby. The hole was drilled to test the presence of a probable buried, copper-molybdenum porphyry deposit (Frankhauser, 1969; Hedderly-Smith, 1999 [Inventory]). The prospective deposit underlies an area about a mile long and a half-mile wide that is oriented north-south. The area is geochemically anomalous and marked by extensive hornfelsing, disseminated pyrite, silicification and sericitization, and scattered occurrences of molybdenite. The rocks in the area consist of metamorphosed shale, sandstone, and andesite of the Luck Creek Breccia of Silurian or Ordovician age that are cut by several types of intermediate igneous rocks. The hole probably went into granodiorite a few hundred feet from the surface.

About 1,200 feet to the southeast, a zone about 8 feet in diameter of sheared and bleached andesite of the Descon Formation contains 50-75 percent pyrite (Hedderly-Smith,1999 [Inventory]). A sample contained 706 parts per million (ppm) copper, 147 ppm lead, 2,142 ppm zinc, 29.1 ppm silver, and 2.557 ppm gold. Hedderly-Smith suggests that the intrusion that Alvenco drilled also has potential as a gold porphyry.

Alteration:

Silicification, sericitization, hornfelsing, and bleaching of metavolcanic and meta-sedimentary rocks.

Age of mineralization:

Probably related to a buried Cretaceous pluton.

Deposit model:

Porphyry copper-molybdenum-gold deposit (Singer and Cox, 1986; model 21a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

21a

Production Status: None

Site Status: Undetermined

Workings/exploration:

At least two diamond-drill holes were put down in the early 1970's; considerable surface prospecting took place then and in the 1990's.

Production notes:

Reserves:

Additional comments:

The land in the vicinity of this prospect has been identified for possible selection by the Sealaska Corporation.

References:

Frankhauser, 1969; Hedderly-Smith, 1992 (Harris River); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1997 (Harris River); Hedderly-Smith, 1999 (Inventory).

Primary reference: Frankhauser, 1969; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Independent; McGilvey

Site type: Prospect

ARDF no.: CR030

Latitude: 55.5453 **Quadrangle:** CR C-3

Longitude: 132.8385

Location description and accuracy:

The location of this old prospect is uncertain. The only map that shows the location is that of Wright and Wright (1908) and it is difficult to correlate their topography with modern maps. They locate the workings at elevations of 1,300 and 2,100 feet at the 'head of the glacial valley of Salmon Lake.' For this record, the site is at an elevation of about 1,300 feet at the southwest head of Andersen Creek, which feeds into Salmon Lake. It is 0.7 mile north-northeast of Pin Peak, and about 0.5 mile northwest of the center of section 17, T. 73 S., R. 83 E. However, there are valleys to the north and south, either of which could be the location described by Wright and Wright.

Commodities:

Main: Au, Pb, Zn

Other:

Ore minerals: Galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The deposit consists of a quartz-calcite vein that contains galena, pyrite, and sphalerite and has high gold values (Wright and Wright, 1908). At the lower adit of the Independent group at an elevation of about 1,300 feet, the vein is about 1 foot thick, strikes N75W and dips 75SW. At the upper adit, at an elevation of about 2,100 feet, the vein is 1 to 2 feet wide, strikes N78W, and dips 75SW. The lower adit is in altered andesite in a sequence of sedimentary rocks; the upper adit is in altered slate and graywacke cut by porphyry dikes. These rocks are now considered part of either the Luck Creek Breccia or the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). Bufvers (1967) notes that the property was restaked in 1945.

Alteration:

The rocks in the vicinity are altered.

Age of mineralization:

Unknown, other than that the vein is in Silurian or Ordovician rocks.

Deposit model:

Polymetallic vein? (Cox and Singer, 1986, model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c?

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only short adits and some surface workings.

Production notes:

Reserves:

Additional comments:
The prospect is probably in the Karta River Wilderness, which is closed to prospecting and mining.

References:
Wright and Wright, 1908; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lucky Nell; Gervais; Summit; Red Jacket; Commander

Site type: Mine

ARDF no.: CR031

Latitude: 55.5098 **Quadrangle:** CR C-3

Longitude: 132.8140

Location description and accuracy:
The Lucky Nell mine is shown on the USGS 1:63,360-scale topographic map; it is about 0.4 mile west-southwest of the center of section 28, T. 73 S., R. 83 E. The mine workings are shown on figure 15 of Herreid and Rose, 1966.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other: As, Sb, W

Ore minerals: Arsenopyrite, chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
The rocks in the vicinity of the Lucky Nell Mine are mainly metamorphosed volcanic and sedimentary rocks near the contact of the Luck Creek Breccia and the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). Wright and Wright (1908) and Roehm (1938 [PE 119-15]) describe the host rock as 'diorite porphyry'; later work indicates that they were describing volcanic rocks of the Luck Creek Breccia or the Descon Formation.

The deposit at the Lucky Nell is a quartz vein 1 to 4 feet thick that strikes N68E and dips 60SE. The vein contains arsenopyrite, pyrite, chalcopyrite, galena, and sphalerite, as well as significant gold and silver values; locally the sulfides make up as much as 50 percent of the vein. Maas and others (1991) collected 58 samples of the vein that contained up to 1.96 ounces of gold per ton, 3.24 ounces of silver per ton, 0.52 percent copper, 6.44 percent lead, and 7.30 percent zinc. Several samples of sulfide-rich ore from the dumps (D.J. Grybeck, unpublished field notes and analyses, 1984) contained up to 500 parts per million (ppm) silver, 2,000 ppm arsenic, 3,000 ppm copper, more than 2 percent lead, 700 ppm antimony, 200 ppm tungsten, more than 1 percent zinc, and 31 ppm gold. A small shipment to a smelter in 1914 returned $33 a ton after deducting shipping and smelter charges.

The Lucky Nell Mine was discovered in 1900 and it has operated or been explored intermittently to at least the recent past. It produced small amounts of ore in 1905, from 1912 to 1914, and probably in a few other years. It produced 39 tons of ore in 1905 (Herreid and Rose, 1966) and 30 tons of ore in 1914 (Bufvers, 1967). The mine is developed by nearly 1,000 feet of underground workings, including 5 adits, a raise, and a winze. Roehm (1938 [PE119-15], 1947 [MIR 195-43]) recorded several visits to the property when it was active. During his last visit a road was being constructed to the mine along Maybeso Creek and equipment for a mill had been cached along the road. There is no indication, however, that the road or the mill reached the property. Swainbank, Bundtzen, and Wood (1991) reported that Guy Comer of Ketchikan reopened the portal and took samples of the underground workings for metallurgical testing.

The Gervais prospect (Brooks, 1902; Herreid and Rose, 1966) and the Summit prospect (Wright and Wright, 1905; Herreid and Rose, 1966) are either similar deposits nearby or alternative names for the the Lucky Nell. Wright and Wright (1908) described the property under the name 'Flora and Nellie claims' and also mentioned several other deposits nearby--the Red Jacket claim and the Commander Group--that are similar to the Lucky Nell, but they have not been described since.

Alteration:

Age of mineralization:
Unknown, other than that the vein cuts Silurian or Ordovician rocks.

Deposit model:
Polymetallic vein with gold and silver values (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The Lucky Nell Mine was discovered in 1900 and it has operated or been explored intermittently to at least the recent past. The mine is developed by nearly 1,000 feet of underground workings, including 5 adits, a raise, and a winze. Roehm (1938 [PE119-15], 1947 [PE 195-43]) recorded several visits to the property when it was active. During his last visit a road was being constructed to the mine along Maybeso Creek and equipment for a mill had been cached along the road. There is no indication, however, that the road or the mill reached the property. Swainbank, Bundtzen, and Wood (1991) reported that Guy Comer of Ketchikan reopened the portal and took samples of the underground workings for metallurgical testing.

Production notes:
The Lucky Nell Mine produced small amounts of ore in 1905, from 1912 to 1914, and probably in a few other years. It produced 39 tons or ore in 1905 (Herreid and Rose, 1966) and 30 tons of ore in 1914 (Bufvers, 1967).

Reserves:
None.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright and Wright, 1908; Smith, 1914; Chapin, 1919; Roehm, 1938 (PE 119-15); Roehm, 1945 (PE 119-29); Roehm, 1947 (MIR 195-43); Herbert and Race, 1964; Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Swainbank, Bundtzen, and Wood, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Dew Drop; Rose

Site type: Prospect

ARDF no.: CR032

Latitude: 55.5198 **Quadrangle:** CR C-3

Longitude: 132.8054

Location description and accuracy:

The prospect on the Dew Drop and Rose claims is about 0.2 mile southeast of peak 2944 at an elevation of about 2,800 feet; it is about 0.4 mile south of the center of section 21, T. 73 S., R. 83 E.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

The Dew Drop and Rose claims are on a quartz vein in metamorphosed volcanic rocks near the contact of the Luck Creek Breccia and the Descon Formation, both of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). The vein contains galena, pyrite, and chalcopyrite (Wright and Wright, 1905, 1908; Wright, 1906, 1907; Herreid and Rose, 1966) The vein is 6 to 14 inches thick; it strikes N60W and dips 85SW. Maas and others (1991) located a 21-foot adit on the prospect but found no sign of mineralization or quartz veins; the highest gold value in their samples was 477 parts per billion. They did, however, find a possible extension of the Lucky Nell vein (CR031) about 500 feet northwest of the Dew Drop prospect; it consists of a 0.5- to 1.0-foot-wide vein with about 70 percent pyrite, sphalerite, galena, and chalcopyrite. Three samples across 0.67 feet of vein averaged 1.25 ounces of gold per ton, 126.9 ounces of silver per ton, 5.22 percent lead, and 2.38 percent zinc.

Alteration:

Age of mineralization:

Unknown, other than that the vein is in Silurian or Ordovician volcanic rocks.

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Some prospecting and at least one short adit.

Production notes:

Reserves:

Additional comments:
The prospect is in the Karta River Wilderness, which is closed to prospecting and mining.

References:
Wright and Wright, 1905; Wright, 1906; Wright, 1907; Wright and Wright, 1908; Cobb, 1978; Herreid and Rose, 1966; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north of Maybeso Creek)

Site type: Occurrence

ARDF no.: CR033

Latitude: 55.5226 **Quadrangle:** CR C-3

Longitude: 132.7175

Location description and accuracy:
This occurrence is about 1.7 miles west-southwest of Granite Mountain and about 0.5 mile east-southeast of the center of section 24, T. 73 S., R. 83 E. The location accurate.

Commodities:

Main: Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, pyrrhotite

Gangue minerals: Calcite, quartz

Geologic description:
Herreid and Rose (1966) discovered this previously unknown occurrence. It is a 100-foot-wide zone with thin quartz-carbonate veins that contain pyrrhotite, chalcopyrite, and galena. The rocks in the vicinity are graywacke, conglomeratic graywacke, slate, limestone, and phyllite of the Descon Formation of Silurian and Ordovician age.

Alteration:

Age of mineralization:
Unknown, other than that the veins are in Silurian or Ordovician sedimentary rocks.

Deposit model:
Thin veins with chalcopyrite, galena, and pyrrhotite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
None; only examination by government geologist.

Production notes:

Reserves:

Additional comments:

References:
Herreid and Rose, 1966; Cobb, 1978.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lucky Jim

Site type: Prospect

ARDF no.: CR034

Latitude: 55.5220 **Quadrangle:** CR C-3

Longitude: 132.6737

Location description and accuracy:

As located by Maas and others (1991), the Lucky Jim prospect is at an elevation of about 2,900 feet, 0.5 mile south of Granite Mountain and about 0.3 mile south-southeast of the center of section 20, T. 73 S., R. 84 E.

Commodities:

Main: Ag, Au, Pb

Other:

Ore minerals: Azurite, galena, malachite, pyrite

Gangue minerals: Quartz

Geologic description:

The rocks in the vicinity of the Lucky Jim prospect are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous; however, recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). Wright and Wright (1908) described the deposit as an auriferous quartz vein that strikes N25W and dips 40NE in granitic rock. The vein also contains pyrite, galena, and secondary copper carbonates. Maas and others (1991) collected two samples that averaged 28.1 parts per million (ppm) silver and 0.96 ppm lead. They also cited an unconfirmed report of a small vein of galena in highly deformed marble. That report contradicts Wright and Wright (1908), who described the prospect as a vein in granitic rock. Maas and others (1995) do not mention marble in their table of deposits in the Hollis area. At the location visited by Maas and others (1991), the workings consisted of a 20-foot shaft and a short adit below the shaft.

Alteration:

Age of mineralization:

Unknown, other than that the vein is in Devonian granitic rocks.

Deposit model:

Unclear; there are contradictory descriptions of the deposit and its host rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

The only workings are a 20-foot shaft and a short adit below the shaft.

Production notes:

Reserves:

Additional comments:

This prospect is now in the Karta River Wilderness Area which is closed to exploration and mining.

References:

Wright and Wright, 1908; Sainsbury, 1961; Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lucky Find

Site type: Prospect

ARDF no.: CR035

Latitude: 55.5284 **Quadrangle:** CR C-3

Longitude: 132.6828

Location description and accuracy:

The only published location for the Lucky Find prospect is on a small map by Wright and Wright (1908) that cannot be reconciled with the modern USGS 1:63,360-scale topographic map. For this record, the location is about 0.3 mile west-southwest of Granite Mountain and about 0.2 mile northwest of the center of section 20, T. 73 S., R. 84 E. The location is probably accurate to within 0.5 mile.

Commodities:

Main: Au?, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz, siderite?

Geologic description:

The rocks in the vicinity of the Lucky Find prospect are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous; however, recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). Wright and Wright (1908) describe this prospect as a 1-foot-thick quartz vein between a diabase dike and granite. The vein also contains calcite and possibly siderite, as well as chalcopyrite and pyrite. The prospect has been explored by a 50-foot tunnel.

Alteration:

Age of mineralization:

Unknown, other than that the vein is in Devonian granitic rocks.

Deposit model:

Gold?-quartz vein, with chalcopyrite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Prospected by a 50 foot tunnel.

Production notes:

Reserves:

Additional comments:

This prospect is in the Karta River Wilderness Area, which is closed to exploration and mining.

References:

Wright and Wright, 1908; Herreid and Rose, 1966; Cobb, 1978; Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Clipper; Cutter; Bendingo

Site type: Prospects

ARDF no.: CR036

Latitude: 55.5304 **Quadrangle:** CR C-3

Longitude: 132.6737

Location description and accuracy:
The only published location of the Clipper and Cutter prospects is on a small-scale map in Wright and Wright (1908). For this record, they are presumed to be 0.2 mile northeast of Granite Mountain and about 0.4 mile north-northeast of the center of section 20, T. 73 S., R. 84 E. The location of the Bendingo prospect is even more speculative; for lack of better information, it is grouped with the Clipper and Cutter prospects.

Commodities:

Main: Ag, Au, Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite

Gangue minerals: Quartz

Geologic description:
The deposit on the Cutter claim is a quartz vein with gold and sulfides (Wright and Wright, 1908). The sulfides are unspecified but the vein reportedly is similar to veins at the Flagstaff Mine (CR043) that contain chalcopyrite, galena, and pyrite. The quartz vein on the Clipper claim is 8 to 18 inches wide in an altered and decomposed diabase dike in granite (Wright and Wright, 1908). The Clipper vein was explored with surface stripping and short test adits. The deposit on the Bendingo claim is a quartz vein in granite; it contains free gold and sulfides, and is similar to the veins at the Flagstaff Mine.
The rocks in the vicinity of these prospects are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered it to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003).

Alteration:

Age of mineralization:
Unknown, other than that the veins are in Devonian granitic rocks.

Deposit model:
Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Inactive

Workings/exploration:
Various combinations of surface stripping and short adits.

Production notes:

Reserves:

Additional comments:
These prospect are now in the Karta River Wilderness Area which is closed to exploration and mining.

References:
Wright and Wright, 1906; Wright and Wright, 1908; Sainsbury, 1961; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Buckhorn

Site type: Prospects

ARDF no.: CR037

Latitude: 55.5336 **Quadrangle:** CR C-3

Longitude: 132.6769

Location description and accuracy:

The Buckhorn prospect is at an elevation of about 3,000 feet about 0.3 mile north of Granite Mountain and 0.5 mile south of the center of section 17, T. 73 S., R. 84 E. The location is accurate.

Commodities:

Main: Ag, Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite

Gangue minerals: Quartz

Geologic description:

The rocks in the vicinity of the Buckhorn prospect are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered it to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). Wright and Wright (1908) described the Buckhorn prospect as 9 claims explored by open cuts and several tunnels. A quartz vein about 15 inches wide that strikes N5W and dips 45NE can be traced for several miles. The vein has free gold and sulfides. The sulfides are unspecified but the vein reportedly is similar to quartz veins at the Flagstaff Mine (CR043) that contain chalcopyrite, galena, and pyrite. Maas and others (1991) found a trench and caved adit. A 1-foot sample across a quartz vein in the trench had negligible metal values. A sample of quartz with pyrite from the dump of the adit contained 2.2 parts per million (ppm) gold and 15.7 ppm silver.

Alteration:

Age of mineralization:

Unknown, other than that the vein is in Devonian granitic rocks.

Deposit model:

Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Inactive

Workings/exploration:

The workings consist of a trench and a caved adit.

Production notes:

Reserves:

Additional comments:
This prospect is in the Karta River Wilderness Area, which is closed to exploration and mining.

References:
Wright and Wright, 1906; Wright and Wright, 1908; Sainsbury, 1961; Herreid and Rose, 1966; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Juneau; Go-by

Site type: Prospects

ARDF no.: CR038

Latitude: 55.5498 **Quadrangle:** CR C-3

Longitude: 132.6851

Location description and accuracy:
As plotted on a small map by Wright and Wright (1908), the Juneau claims are about halfway between Granite Mountain and Salmon Lake; by implication, the Go-by claims are nearby. For this record, the location is about 1.2 mile north-northwest of Granite Mountain and about 0.5 mile southwest of the center of section 8, T. 73 S., R. 84 E. The claims are probably within one-half mile of this location.

Commodities:

Main: Au, Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite

Gangue minerals: Quartz

Geologic description:
The rocks in the vicinity of these prospects are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). The only published description of the deposits on the Juneau and Go-by claims indicates that they are similar to the other gold-quartz veins on Granite Mountain (Wright and Wright, 1908). There is no information about any workings.

Alteration:

Age of mineralization:
Unknown, other than that the veins are in Devonian granitic rocks.

Deposit model:
Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Inactive

Workings/exploration:
There is no information about any workings on these prospects.

Production notes:

Reserves:

Additional comments:
These prospect are in the Karta River Wilderness Area, which is closed to exploration and mining.

References:
Wright and Wright, 1908; Cobb, 1978; Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lone Jack

Site type: Prospect

ARDF no.: CR039

Latitude: 55.5634 **Quadrangle:** CR C-3

Longitude: 132.6789

Location description and accuracy:

The Lone Jack prospect is at an elevation of about 400 feet, about 1.2 mile east-southeast of the mouth of McGilvery Creek on Salmon Lake. It is just north of the center of the southern boundary of section 5, T. 73 S., R. 84 E.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

The Lone Jack prospect has a tunnel at an elevation of about 400 feet; large quartz boulders are on the dump (Roehm, 1938 [PE 119-8]. Between about 300 and 400 feet elevation, 2 parallel quartz veins in diorite are exposed for about 500 feet along a creek. Large masses of pyrite are scattered in the veins. Assays showed less than $1 per ton each in gold and silver. Maas and others (1995) collected several samples of quartz with minor pyrite and chalcopyrite that contained 20 to 1,850 parts per billion gold, 0.4 to 10.8 parts per million (ppm) silver, and 30 to 2,516 ppm copper.

The rocks in the vicinity of this prospect are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003).

Alteration:

Age of mineralization:

Unknown, other than that the veins are in Devonian granitic rocks.

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status: None

Site Status: Probably inactive

Workings/exploration:

At least one short adit.

Production notes:

Reserves:

Additional comments:
This prospect is in the Karta River Wilderness Area, which is closed to exploration and mining.

References:
Roehm, 1938 (PE 119-8); Sainsbury, 1961; Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1938 (PE 119-8)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Rush Peak)

Site type: Occurrence

ARDF no.: CR040

Latitude: 55.6397 **Quadrangle:** CR C-3

Longitude: 132.6903

Location description and accuracy:

This occurrence is exposed in a road-metal pit about 1.4 miles northwest of Rush Peak and about 0.1 mile southeast of the center of section 9, T. 72 S., R. 83 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:

This occurrence was first described by Maas and others (1995). The rocks in the vicinity are part of the Silurian and Ordovician, andesitic breccia unit of Luck Creek (Eberlein and others, 1983; Brew, 1996). The occurrence consists of clots and disseminations of chalcopyrite and pyrite along fault zones of varying attitude in a 75-foot-thick section of brecciated argillite and agglomerate. Locally the mineralized fault zones forms stockworks. Up to 3 percent of the material along the fault zones is chalcopyrite but most zones contain much less. A chip sample across 4 feet of mineralized rock contained 2,619 parts per million copper and no gold.

Alteration:

Age of mineralization:

Unknown, other than that the occurrence is in Silurian or Ordovician rocks.

Deposit model:

Chalcopyrite along fault zones.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Jarvis Island)

Site type: Occurrence

ARDF no.: CR041

Latitude: 55.5031 **Quadrangle:** CR C-2

Longitude: 132.5546

Location description and accuracy:
This occurrence is about 0.3 mile southwest of the center of Jarvis Island in the NW1/4 section 31, T. 73 S., R. 85 E. The location is accurate.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:
Sainsbury (1961) identified chalcopyrite in recrystallized limestone, and chalcopyrite, pyrrhotite, and pyrite in quartz veinlets in skarn at the contact of a quartz diorite body that intrudes the Ordovician and Silurian Descon Formation. Sainsbury mapped the intrusion as Cretaceous but it probably is part of the large pluton to the northwest across Twelvemile Arm, which has recently been dated as Devonian (S.M. Karl, oral communication, 2003). Maas and others(1991) took two samples of skarn that contained negligible metal values.

Alteration:
Skarn developed at contact of a Devonian(?) granitic intrusion.

Age of mineralization:
Probably related to the contact zone of a Devonian(?) granitic intrusion.

Deposit model:
Skarn with quartz veinlets.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only limited surface sampling by government geologists.

Production notes:

Reserves:

Additional comments:

This occurrence is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Sainsbury, 1961; Cobb, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Sainsbury, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Stella; Monday

Site type: Mine?

ARDF no.: CR042

Latitude: 55.5026 **Quadrangle:** CR C-2

Longitude: 132.6079

Location description and accuracy:

In most reports, the Monday prospect is located about 0.9 mile west-northwest of Kajusgidnas Point and about 0.5 mile north-northwest of the center of section 35, T. 73 S., R. 84 E. Herreid and Rose (1966) and Maas and others (1991) did not visit it or could not find it; they use Brooks' (1902) location, which may not be accurate.

Commodities:

Main: Ag, Au, Pb, Zn

Other:

Ore minerals: Galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The Monday deposit is a quartz vein 4 to 14 inches thick along a shear zone (Brooks, 1902; Herreid and Rose, 1966). The quartz contains galena and pyrite; assays showed $5 to $8 per ton in gold (at $20.67 per ounce) and 15-40 ounces of silver per ton. The only workings are open cuts. There is no indication of work since 1901. The rocks in the vicinity of the Monday prospect are Silurian or Ordovician slate of the Descon Formation; sheared andesite forms one wall of the vein.

The Stella prospect is nearby. Wright and Wright (1908) describe it as a 3-foot-thick quartz-calcite vein with gouge along one wall; the vein follows the contact between a diorite porphyry dike and black slate. The quartz carries pyrite, galena, and sphalerite. The gold content is low. The prospect was explored by a 130-foot tunnel, which Maas and others (1991) could not find.

Alteration:

Age of mineralization:

Unknown, other than that the prospects are in Silurian or Ordovician rocks.

Deposit model:

Polymetallic vein? (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c?

Production Status: None

Site Status: Undetermined

Workings/exploration:

The only workings on the Monday prospect are open cuts. The Stella prospect was explored by a 130-foot tunnel.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Herreid and Rose, 1966; Cobb, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Brooks, 1902; Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Flagstaff; Last Chance; Treasure

Site type: Mine

ARDF no.: CR043

Latitude: 55.5355 **Quadrangle:** CR C-2

Longitude: 132.6627

Location description and accuracy:

The Flagstaff Mine is a well known property on the east side of Granite Mountain. The workings are extensive and the location used here is the main adit of the mine at an elevation of about 1,400 feet. This adit is shown on the USGS 1:63,360-scale topographic map; it is about 0.5 mile southwest of the center of section 16, T. 73 S., R. 84 E.

Commodities:

Main: Ag, Au, Pb

Other: Cu, Zn

Ore minerals: Bornite, chalcocite, chalcopyrite, copper, covellite, galena, gold, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

The rocks in the vicinity of the Flagstaff Mine are part of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). The granitic rocks are cut by diabase dikes of unknown age.

The Flagstaff mine is a well known property that has been described several times in considerable detail (Wright and Wright, 1908; Twenhofel and others, 1949; Stewart, 1938, 1944; Maas and others, 1991). The property has two vein systems. The main workings of the mine are on a quartz vein--the lower or Flagstaff vein-- that can be traced for nearly a mile through a vertical extent of at least 1,300 feet. The vein strikes about N55W and dips 60-86NE. The footwall of the vein is a diabase dike more than 8 feet thick that near the vein is almost completely altered to calcite, chlorite, and brown clay. Twenhofel and others (1949) describe the hanging wall as diorite and gabbro. ((Detailed maps of the main vein are on Plate 1 of Twenhofel and others (1949) and on several appendices in Stewart (1944)). The vein varies from less than an inch to more than 36 inches thick; it averages about 18 inches thick but the thickness often varies abruptly. The vein is white, vuggy quartz with free gold and locally abundant sulfide minerals that in many places are banded parallel to the vein. The sulfide minerals include galena, chalcopyrite, pyrite, bornite, and sphalerite. Native copper, covellite and chalcocite occur and may be secondary. The sulfides average 1-2 percent of the vein but may form up to 5 percent locally. The main vein has been sampled several times (see Stewart, 1944, in particular). There are high gold and silver values, but the data are not systematic enough to provide their average values in the vein. The mill operators told Stewart (1938) that the ore was running about $25 to $35 in gold and silver (with gold at $35 per ounce). Maas and others (1991) sampled the main vein. One sample across 2.5 feet of the vein contained 0.35 ounce of gold per ton, 10.77 ounces of silver per ton, and 7.04 percent lead. The weighted average of 4 other samples was 0.15 ounce of gold and 1.75 ounce of silver per ton across an average width of 1.9 feet.

The upper vein is exposed west of the main workings of the mine between about 2, 600 to 2,800 feet elevation near the top of Granite Mountain. This vein strikes about N25E and dips about 20NW, but it is cut by several cross faults and/or deflects markedly and varies in strike and dip. It varies in width from about 1 to 3 feet. The upper vein is similar to the lower vein, but it is mainly in quartz diorite. The intersection of the two veins has not been found. The upper vein has less sulfides but more free gold than the lower vein.

The property was originally staked prior to 1905 as the Treasure group and was developed by two tunnels, one 50 feet long and the other 400 feet long. The 400-foot tunnel became the main adit of the mine (Wright and Wright, 1908; Twenhofel and others, 1949; Stewart, 1938, 1944; Maas and others, 1991, 1995). In 1912, the claims were restaked as the Last Chance Group. Another 50-foot adit was driven at an elevation of about 2,400 feet and there were several other short adits. There was little work on the property until 1935, when the main adit was extended another 80 feet. In 1937, the Flagstaff Mining Company was formed to develop the property and they extended the main adit to a length of 515 feet, built a road to the property, and established a 25-ton mill at the bottom of a tramway from the main adit to the valley below. Mining and milling continued intermittently until the fall of 1941 when the property reverted to its original owners and the mine closed. Poor gold and silver recovery in the mill is cited as a major cause of the closure. There is no record of production since, but El Paso Mining and Milling Company examined the property in the mid-70's and Killick Gold Company, Ltd. optioned the property and did geological mapping and geochemical surveys from 1980 to 1988.

Maas and others (1995) give the total production of the Flagstaff Mine as 257 ounces of gold, 1,980 ounces of silver, 2,864 pounds of copper, and 5,926 pounds of lead from 873 tons of ore; however, they cite another report that gives the total production from 1938 to 1940 as 1,305 tons of ore.

Alteration:

Diabase dikes are almost totally altered to chlorite, calcite, and brown clay near the veins.

Age of mineralization:

Unknown, other than that the veins are in Devonian granitic rocks.

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

The property was originally staked prior to 1905 as the Treasure group and was developed by two tunnels, one 50 feet long and the other 400 feet long. The 400-foot tunnel became the main adit of the mine (Wright and Wright, 1908; Twenhofel and others, 1949; Stewart, 1938, 1944; Maas and others, 1991, 1995). In 1912, the claims were restaked as the Last Chance Group. Another 50-foot adit was driven at an elevation of about 2,400 feet and there were several other short adits. There was little work on the property until 1935, when the main adit was extended another 80 feet. In 1937, the Flagstaff Mining Company was formed to develop the property and they extended the main adit to a length of 515 feet, built a road to the property, and established a 25-ton mill at the bottom of a tramway from the main adit to the valley below. Mining and milling continued intermittently until the fall of 1941 when the property reverted to its original owners and the mine closed. Poor gold and silver recovery in the mill is cited as a major cause of the closure. There is no record of production since, but El Paso Mining and Milling Company examined the property in the mid-70's and Killick Gold Company, Ltd. optioned the property and did geological mapping and geochemical surveys from 1980 to 1988.

Production notes:

Maas and others (1995) give the total production of the Flagstaff Mine as 257 ounces of gold, 1,980 ounces of silver, 2,864 pounds of copper, and 5,926 pounds of lead from 873 tons of ore; however, they cite another report that gives the total production from 1938 to 1940 as 1,305 tons of ore.

Reserves:

Probably none.

Additional comments:

This mine is in the Karta River Wilderness Area, and any area which is not already a valid claim or is patented is closed to exploration and mining.

References:

Wright and Wright, 1906; Wright, 1907; Wright and Wright, 1908; Chapin, 1916; Chapin, 1918; Stewart, 1938; Smith, 1939 (B 910-A); Wilcox, 1938 (PE 119-6); Smith, 1941; Smith, 1942 (B 933-A); Stewart, 1944; Tolonen, 1945; Twenhofel and others, 1949; Sainsbury, 1961; Herreid and Rose, 1966; Bufvers, 1967; Black, 1981; St. Louis, 1981; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Stewart, 1944; Twenhofel and others, 1949

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (outlet of Salmon Lake)

Site type: Occurrence

ARDF no.: CR044

Latitude: 55.5746 **Quadrangle:** CR C-2

Longitude: 132.6423

Location description and accuracy:
This occurrence is at the mouth of Salmon Lake. It is near the northeast corner of section 4, T. 73 S., R. 84 E. The location is accurate.

Commodities:

Main: Cu, Pb, W

Other:

Ore minerals: Chalcopyrite, galena, scheelite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:
This occurrence is at or near the contact of a large granodiorite-quartz diorite stock (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). Early workers considered the stock to be Mesozoic or Cretaceous, but recent radiometric dating indicates that it is Devonian (S.M. Karl, oral communication, 2003). The pluton is in contact with hornfelsed chert, argillite, graywacke, and tuff of the Silurian and Ordovician Descon Formation. The rocks near the contact contain disseminated sulfides and quartz-sulfide veins with a few grains of scheelite (Sainsbury, 1961). The sulfides are mainly pyrite and pyrrhotite with minor chalcopyrite and galena.

Alteration:
The mineralized sedimentary rocks near the contact are hornfelsed.

Age of mineralization:
The mineralization is in the contact zone of a Devonian granitic pluton and is probably related to its emplacement.

Deposit model:
Contact metamorphic Cu-Pb-W deposit.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:
Only surface sampling by a government geologist.

Production notes:

Reserves:

Additional comments:
This occurrence is in the Karta River Wilderness Area, which is closed to exploration and mining.

References:
Sainsbury, 1961; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Sainsbury, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Paul Young Creek)

Site type: Occurrence

ARDF no.: CR045

Latitude: 55.6048 **Quadrangle:** CR C-2

Longitude: 132.6007

Location description and accuracy:
This occurrence is at an elevation of about 170 feet, about 1.3 miles northwest of the mouth of Paul Young Creek. It is about 0.2 mile east of the northwest corner of section 30, T. 72 S, R. 84 E. The location is accurate.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:
As described by Sainsbury (1961), this prospect consists of several trenches along about 350 feet of a creek that coincides with a fault. The rocks in the vicinity are black argillite of the Descon Formation of Silurian and Devonian age. In the southernmost trench, pyrite and chalcopyrite occur in seams one-eighth to one-quarter inch thick and in quartz veins along bedding. About 40 feet upstream, pyrite and chalcopyrite form disseminations and sulfide veins that also contain calcite. At a third trench, about 200 feet upstream, pyrite-bearing calcite veins up to 6 inches thick occur along joints in the argillite. The rocks along the fault to the northwest and southeast of this occurrence are sheared and pyritized. This is probably a prospect noted by Chapin (1919).

Alteration:
Pyritization along fault zone.

Age of mineralization:
Unknown, other than that the occurrence is in Silurian or Ordovician argillite.

Deposit model:
Cu in small veins and layers along a fault in argillite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
At least three trenches.

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1919; Sainsbury, 1961; Cobb, 1978.

Primary reference: Sainsbury, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Venus

Site type: Prospect

ARDF no.: CR046

Latitude: 55.6094 **Quadrangle:** CR C-2

Longitude: 132.5868

Location description and accuracy:

The Venus prospect is about 1.3 miles north-northwest of the mouth of Paul Young Creek in about the center of the SE1/4 section 19, T. 72 S., R. 84 E.

Commodities:

Main: Ag, Au, Cu, Fe, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, pyrrhotite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The bedded rocks in the vicinity of the Venus prospect are Silurian: they include conglomerate with chert, rhyolite, and diorite clasts; and volcanic graywacke, tuff, agglomerate, and andesite. A Cretaceous gabbro pluton is south of the prospect (Sainsbury, 1961).

As described by Roehm (1938 [PE 119-12]), Warner and others (1961), and Maas and others (1995), the prospect is in greenstone (andesite?) cut by a diorite dike. The deposit is a vein that strikes N85E, dips steeply south, and is exposed for about 200 feet. The vein varies from a few inches thick at its eastern end to about 6 feet thick at its western end. Figure 35 of Warner and others (1961) is a map of the deposit. The vein locally is almost entirely pyrrhotite, with minor pyrite, sphalerite, chalcopyrite. The gangue is quartz and calcite. Three samples contained 0.01 ounce of gold per ton, up to 1 ounce of silver per ton, 0.91 to 1.78 percent copper, 33.1 to 52.4 percent iron, and 0.13 to 1.01 percent zinc (Warner and others, 1961). A sample across 6 feet of the vein contained 1.7 percent copper, 0.2 percent zinc, and 40.2 parts per million silver (Maas and others, 1995). The volcanic rocks up to several meters from the vein have been pyritized and intensely altered to chlorite and epidote.

The deposit was found in 1904 by a magnetic survey. The workings consist of more than 800 feet of trenches and at least one short adit. Maas and others (1995) estimate that the deposit has an inferred resource of about 7,200 metric tons of material of variable grade.

Alteration:

The volcanic rocks up to several meters from the vein have been pyritized and intensely altered to chlorite and epidote.

Age of mineralization:

Unknown, other than that the vein in in Silurian volcanic and sedimentary rocks.

Deposit model:

Pyrrhotite vein with chalcopyrite and sphalerite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

The deposit was found in 1904 by a magnetic survey. The workings consist of more than 800 feet of trenches and at least one short adit.

Production notes:

Reserves:

Maas and others (1995) estimate that the deposit has an inferred resource of about 7,200 metric tons of material of variable grade.

Additional comments:

References:

Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Wright, 1915; Roehm, 1938 (PE 119-12); Warner and others, 1961; Sainsbury, 1961; Maas and others, 1992; Maas and others, 1995.

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on North Pole Hill)

Site type: Prospects

ARDF no.: CR047

Latitude: 55.6364 **Quadrangle:** CR C-2

Longitude: 132.6041

Location description and accuracy:

There are several prospects in the large gabbro-pyroxenite pluton that forms North Pole Hill (Sainsbury, 1961). There are numerous pits and mineral occurrences scattered on the hill and this site is somewhat arbitrarily located at about the center of the hill, near the southwest corner of section 7, T. 72 S., R. 84 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Bornite

Gangue minerals:

Geologic description:

The gabbro and pyroxenite that makes up North Pole Hill is an extension of the pluton at the Salt Chuck Mine (CR049), where it has been dated at 429 Ma (Loney and others, 1987).

In 1954 and 1955, Juan Munoz carried out geophysical and geochemical surveys on North Pole Hill and dug several prospects pits that showed bornite in the gabbro and pyroxenite (Munoz, 1955; Sainsbury, 1961). In 1969--and perhaps other years--Munoz drilled several holes on the body (D.J. Grybeck, field visit, 1969). Although not well documented, North Pole Hill has been examined and prospected repeatedly since the 1970s because of its proximity and similar geology to the Salt Chuck Mine. Santoy Resources Ltd. is currently active on North Pole Hill (http://www.santoy.ca/index.html; Sept. 2003). They have one showing on the north flank of the hill ('Geoff showing') with samples that contained 1.1 percent copper and 0.19 gram of palladium per ton. They also located a previously unknown small adit (at an unspecified location on the hill); grab samples from the dump contained 2.67 percent copper, 0.63 gram of palladium per ton, 2.42 grams of gold per ton, and 14.03 grams of silver per ton.

In his 1954 and 1955 work, Munoz also located several pyritiferous quartz veins, 6 to 18 inches thick, near a prominent fault. They contained about $7.00 in gold (at $35 per ounce). Those veins are probably at the prospect (shown on Plate 33 of Sainsbury, 1961) at about the center of section 7, T. 72 S., R. 84 E.

Alteration:

Age of mineralization:

The gabbro on North Pole Hill has been dated at 429 Ma; the bornite deposit is probably cogenetic with the intrusion of the gabbro.

Deposit model:

Disseminated bornite in gabbro.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active

Workings/exploration:

Prospect pits and at least two drill holes. Although not well documented, North Pole Hill has been examined and prospected repeatedly since the 1970s because of its proximity and similar geology to the Salt Chuck Mine. Santoy Resources Ltd. is currently active on North Pole Hill (http://www.santoy.ca/index.html; Sept. 2003). They have one showing on the north flank of the hill ('Geoff showing') with samples that contained 1.1 percent copper and 0.19 gram of palladium per ton. They also located a previously unknown small adit (at an unspecified location on the hill); grab samples from the dump contained 2.67 percent copper, 0.63 gram of palladium per ton, 2.42 grams of gold per ton, and 14.03 grams of silver per ton.

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Production notes:

Reserves:

Additional comments:

References:

Munoz, 1955; Sainsbury, 1961; Cobb, 1978; Loney and others, 1987; Maas and others, 1992; Maas and others, 1995.

Primary reference: Sainsbury, 1961; Loney and others, 1983

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Rush and Brown

Site type: Mine

ARDF no.: CR048

Latitude: 55.6256 **Quadrangle:** CR C-2

Longitude: 132.5880

Location description and accuracy:

The main shaft of the Rush and Brown Mine is marked by name on the USGS 1:63,360-scale topographic map; it is about 0.2 mile southeast of the center of section 18, T. 72 S., R 84 E, The extensive workings of the Rush and Brown are shown on plates 19 and 20 of Warner and others (1961).

Commodities:

Main: Ag, Au, Cu, Fe

Other:

Ore minerals: Chalcopyrite, pyrite, pyrrhotite

Gangue minerals: Magnetite

Geologic description:

The rocks in the vicinity of the Rush and Brown Mine are mostly greenstone (probably metamorphosed andesite) and minor sedimentary rocks. They are part of the Descon Formation of Silurian and Ordovician age (Sainsbury, 1961; Eberlein and others, 1983; Brew, 1996). No limestone or marble is present in the mine but tactites are developed near a large magnetite ore body.

The mine has two types of deposits: a mass of magnetite and sulfide veins (Warner and others, 1961). The magnetite ore body consists almost entirely of magnetite with minor chalcopyrite and pyrite along tiny fractures in the magnetite. Aside from a few pillars, the magnetite ore body was almost entirely mined out from a glory hole. Originally it was about 160 feet long, 40-50 feet thick, and about 100 feet deep. Some additional magnetite-rich material is exposed but it had too low a copper content to mine.

The main sulfide vein, which extends from the surface to the 500-foot level, was the principal source of the ore. It strikes about N60E at the surface, about N55E at the 200-foot level, and nearly east at the 400-foot and 450-foot levels. The vein dips 60SE at the surface, 55SE at the 200-foot level, and 30E at the 500-foot level. In places the stopes were 14 feet wide. As described by Mertie (1921), the ore body in the vein consisted of chalcopyrite with some pyrite and pyrrhotite, that occurred in lenses and reticulated veins and veinlets in sheared rock. The gangue is mostly crushed country rock The ore bodies extended about 400 feet horizontally from the surface to the deepest level of workings at the 500-foot level. There are also several smaller, similar veins nearby that have not been mined.

The Rush and Brown Mine was discovered in 1904 and ore was shipped almost continuously from 1906 to 1923 by the Alaska Copper Company and U.S. Rush, the owner of the mine. The mine closed in 1923 for lack of a convenient smelter to process the ore and due to low copper prices. In 1929, a subsidiary of the Consolidated Mining and Smelting Company optioned the mine and shipped a small amount of ore. The mine consists of 6 levels and a glory hole. Plate 19 of Warner and others (1961) is a map of the workings. The U.S. Bureau of Mines drilled 4 holes during World War II (Holt and others, 1948). There is a long adit--the Sawmill adit--that was driven to tap the ore body at depth. Warner and others note that the adit stopped about 175 feet short of the main vein. Maas and others (1995) indicate that the Sawmill adit was extended sometime between 1960 and the mid-1980's to intersect the main vein at about the 200-foot level; their figure 9 is a map of the extension and the stopes that were mined from it. In 1995, the Rush and Brown Mine was on claims controlled by Fox Geological Consultants, Ltd. Most of the exploration and emphasis has been at Salt Chuck (CR049), but the Rush and Brown Mine continues to be of interest.

Holt and others (1948) indicate that the main vein down to the 500-foot level produced 9,700 tons of hand-sorted ore that averaged 10.5 percent copper, 0.26 ounce of gold per ton, and 1.6 ounce of silver per ton. The magnetite ore body produced about 35,000 tons of ore that contained an average of 3.25 percent copper, 0.06 ounce of gold per ton, and 0.25 ounce of silver per ton. Maas and others (1995) give the total production of the mine as 2,160 tons of copper, 1.65 tons of silver, and 8,198 ounces of gold. The magnetite ore body was entirely mined out. The ore bodies on the main vein appear to extend undiminished in grade and size below the deepest workings at the 500 level.

Alteration:

Tactite developed in the magnetite ore body.

Age of mineralization:

Unknown; the host rocks are Silurian or Ordovician and the deposits are similar to the Cu-Fe deposits on the Kasaan Peninsula (see, for example, CR051).

Deposit model:

Magnetite mass with minor chalcopyrite and pyrite and a mineralized shear (vein) with chalcopyrite and minor pyrite and pyrrhotite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

The Rush and Brown Mine was discovered in 1904 and ore was shipped almost continuously from 1906 to 1923 by the Alaska Copper Company and U.S. Rush, the owner of the mine. The mine closed in 1923 for lack of a convenient smelter to process the ore and due to low copper prices. In 1929, a subsidiary of the Consolidated Mining and Smelting Company optioned the mine and shipped a small amount of ore. The mine consists of 6 levels and a glory hole. Plate 19 of Warner and others (1961) is a map of the workings. The U.S. Bureau of Mines drilled 4 holes during World War II (Holt and others, 1948). There is a long adit--the Sawmill adit--that was driven to tap the the ore body at depth. Warner and others note that the adit stopped about 175 feet short of the main vein. Maas and others (1995) indicate that the Sawmill adit was extended sometime between 1960 and the mid-1980's to intersect the main vein at about the 200-foot level; their figure 9 is a map of the extension and the stopes that were mined from it. In 1995, the Rush and Brown Mine was on claims held by Fox Geological Consultants, Ltd. (Maas and others, 1995).

Production notes:

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Reserves:

The magnetite ore body was almost entirely mined out. The ore bodies on the main vein appear to extend undiminished in grade and size below the lowest workings at the 500 level.

Additional comments:

References:

Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909;

Knopf, 1910; Knopf, 1911; Wright, 1915; Chapin, 1916; Mertie, 1921; Smith, 1932; Smith, 1936; Thorne and others, 1945; Holt and others, 1948; Wells and others, 1957; Sainsbury, 1961; Warner and others, 1961; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Warner and others, 1961; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Salt Chuck; Stevens; Liebrant; Goodro; Joker

Site type: Mine

ARDF no.: CR049

Latitude: 55.6339 **Quadrangle:** CR C-2

Longitude: 132.5602

Location description and accuracy:

The Salt Chuck Mine is labeled on the USGS 1:63,360-scale topographic map, but at the wrong location. The principal workings of the mine are about 0.3 mile west of the mine symbol on the map, or about 0.5 mile north-northeast of the center of section 17, T. 72 S., R. 84 E. The location of the underground workings and glory holes of the mine are shown in detail on the maps and diagrams of Gault (1945) and Gault and Wahrhaftig (1992).

Commodities:

Main: Ag, Au, Cu, Pd, Pt

Other: Sb, Te

Ore minerals: Bornite, chalcocite, chalcopyrite, covellite, digenite, gold, hessite, isomertieite, kotulskite, magnetite, pyrite, pyrrhotite, sopocheite, sperrylite, stibiopalladonite, temanganite

Gangue minerals: Calcite, clinopyroxene, epidote, plagioclase

Geologic description:

The Salt Chuck Mine is in a mafic pluton about 4.5 miles long and up to a mile wide in outcrop. The pluton consists of gabbro, clinopyoxenite, and diorite and most workers believe that the pluton is roughly cogenetic with the mineral deposit (Gault, 1945; Sainsbury, 1961; Gault and Wahrhaftig, 1992; Loney and others, 1987). Detailed studies by Watkinson and Melling (1992) and by Loney and Himmelberg (1992) describe the rocks in the vicinity of the mine as layered gabbro intruded by magnetite-bearing pyroxenite. The host rocks at the deposit are variably altered to epidote, actinolite, chlorite, sericite, titanite, and calcite. The pluton has been dated at 429 Ma (Loney and others, 1987). It intrudes metamorphosed volcanic and sedimentary rocks of the Descon Formation of Silurian and Devonian age (Eberlein and others, 1983; Brew, 1996).

The deposit consists chiefly of bornite, chalcopyrite, and platinum-group minerals that occur as disseminations or as veinlets and irregular masses in the gabbro and clinopyroxenite (Wright 1915; Mertie, 1921; Buddington and Chapin, 1929; Gault, 1945; Sainsbury, 1961; Page and others, 1973). The ore bodies are generally pods, lenses, and irregular masses with higher-grade cores. Numerous small faults cut the ore bodies. Most of the sulfides are in clinopyroxenite near its contact with gabbro. The ore minerals include varying amounts of digenite, chalcocite, and covellite that often rim bornite and chalcopyrite; they are mainly in irregular disseminated masses but some are in pyrite-pyrrhotite veins, and in epidote or calcite veinlets. The platinum-group minerals are mainly kotulskite (PdTe) or sperrylite (PtAs2), with minor amounts of the palladium-antimony minerals stibiopalladonite and isomertieite. The kotulskite is variably altered to temanganite (Pd3HgTe3) or intergrown with or rimmed by sopocheite (Pd3Ag4Te4) and hessite (Ag2Te). The platinum-group minerals occur in small grains and masses in epidote, at sulfide grain boundaries, and, in decreasing order of abundance, in chalcopyrite, digenite, chalcocite, and covellite. Argentian gold occurs in chalcopyrite, in complex intergrowths with platinum-gourp minerals, and in epidote rims on clinopyroxene.

The deposit probably formed in two stages: 1) magmatic deposition of sulfides and platinum-group minerals, probably near the contact between layered gabbro and clinopyroxenite; and 2) remobilization of the sulfides and platinum-group minerals by low-temperature deuteric, or externally derived, chlorine-rich fluids with redeposition near gabbro-clinopyroxenite contacts.

The deposit at the Salt Chuck Mine was discovered in 1906 and produced copper, silver, gold, and palladium intermittently until 1941 (Wright and Wright, 1908; Wright, 1915; Mertie, 1921; Gault, 1945; Holt and others, 1948; Roppel, 1991; Maas and others, 1995). In 1915, platinum was discovered in the ore but it wasn't until 1917 that palladium was recognized. A succession of companies operated the mine: the Goodro Mining Company from 1907 to 1916; the Salt Chuck Mining Company from 1918 to 1920; the Alaska Palladium Company from 1924 to 1926; the Solar Development Company from 1929 to 1931; and the Alaska Gold and Metals Company from 1935 to 1941. For most of its life, the mine was the only producer of palladium in the United States and the price of palladium, which varied markedly, was a key factor in the profitability of the mine. During World War II, the U.S. Geological Survey and the U.S. Bureau of Mines studied the deposit in detail, drilled 13 holes, and reinterpreted 7 holes that had been drilled earlier by Solar Development Company (Gault, 1945; Holt and others, 1948; Gault and Wahrhaftig, 1992).

The workings of the mine are shown in detail on the maps and diagrams of Gault (1945) and Gault and Wahrhaftig (1992). The deposit was mined in three glory holes connected by an intricate network of raises, stopes, and drifts at three levels. The workings connected to a main haulage tunnel at the 300-foot level that led to a mill (described in detail by Mertie, 1921) on the shore of the salt chuck at the head of Kasaan Bay.

Since at least the late 1970's, the deposit has been almost continuously active with varying degrees of intensity. Orbex Resources, in a joint venture with Alaska Platinum Company, did extensive mapping and geochemical work on the property from 1980 to 1989 and drilled several holes (Nevin and Reader, 1979; Peterson and Stevens, 1981; Payne, 1985; Goodall and Fox, 1988, 1989). Stealth Ventures worked at the property in 1997 and 1998, and since November, 2000, Santoy Resources Ltd. has owned the property and continues to explore the deposit (http://www.santoy.ca/index.html; March, 2004).

According to Gault (1945), the total production (from incomplete records) from 1907 to to 1941 was about 300,000 tons of ore. The ore averaged 0.9 percent copper, 0.01 ounce of gold per ton, 0.10 ounce of silver per ton, and 0.05 ounce of palladium per ton. In its later years of production under the Alaska Gold and Metals Company, the ore contained 0.94 percent copper, 0.04 ounce of gold per ton, 0.15 ounce of silver per ton, and 0.065 ounce of palladium per ton. Bundtzen and others (1988) indicated that the work by American Platinum Company defined several zones that contain up to 7.8 percent copper, 0.7 ounce of gold per ton, 0.25 ounce of palladium per ton, and 0.007 ounce of platinum per ton. Maas and others (1995) give the total production of the mine as about 6.2 million pounds of copper, 55,620 ounces of silver, 20,540 ounces of palladium, and 11,740 ounces of gold. According to almost all of the literature, the platinum content of the ore was negligible or not mentioned, but Mertie (1969) indicates that there may have been much more platinum in the ore than is generally recognized.

Gault (1945) gives a detailed analysis of the ore reserves at the mine. At a 0.2 percent cutoff for copper, the total reserves in three ore bodies are 251,000 tons of material with 0.65 to 0.92 percent copper, 0.005 to 0.25 ounce of gold per ton, 0.07 to 0.26 ounce of silver per ton, and 0.0 to 0.13 ounce of platinum-group elements per ton. The reserves are smaller at higher copper grades. Nevin and Reader (1979) estimate that the total resources and reserves of the deposit are about 244,000 tons of material with 0.6 percent copper, 0.45 parts per million (ppm) gold, 5.55 ppm silver, and 0.1 ppm palladium.

At various times over the life of the mine, it or claims that were eventually incorporated into the property have been given a variety of names, including the Goodro, Stevens, Joker, and Leibrant.

Alteration:

The host rocks are variably altered to epidote, actinolite, chlorite, sericite, titanite, and calcite.

Age of mineralization:

The deposit is probably rough cogenetic with the 429 Ma gabbro-clinopyroxenite body that hosts it.

Deposit model:

Cu and platinum-group minerals in gabbro-clinopyroxene intrusion.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes

Site Status: Active

Workings/exploration:

The workings of the mine are shown in detail on the maps and diagrams of Gault (1945) and Gault and Wahrhaftig (1992). The deposit was mined in three glory holes connected by an intricate network of raises, stopes, and drifts at three levels. The workings connected to a main haulage tunnel at the 300-foot level that led to a mill (described in detail by Mertie, 1921) on the shore of the salt chuck at the head of Kasaan Bay.

Since at least the late 1970's, the deposit has been almost continuously active with varying degrees of intensity. Orbex Resources, in a joint venture with Alaska Platinum Company, did extensive mapping and geochemical work on the property from 1980 to 1989 and drilled several holes (Nevin and Reader, 1979; Peterson and Stevens, 1981; Payne, 1985; Goodall and Fox, 1988, 1989). Stealth Ventures worked at the property in 1997 and 1998, and since November, 2000, Santoy Resources Ltd. has owned the property and continues to explore the deposit (http://www.santoy.ca/index.html; March, 2004).

Production notes:

The deposit at the Salt Chuck Mine was discovered in 1906 and produced copper, silver, gold, and palladium intermittently until 1941 (Wright and Wright, 1908; Wright, 1915; Mertie, 1921; Gault, 1945, Holt and others, 1948; Roppel, 1991; Maas and others, 1995). In 1915, platinum was discovered in the ore but it wasn't until 1917 that palladium was recognized. A succession of companies operated the mine: the Goodro Mining Company from 1907 to 1916; the Salt Chuck Mining Company from 1918 to 1920; the Alaska Palladium Company from 1924 to 1926; the Solar Development Company from 1929 to 1931; and the Alaska Gold and Metals Company from 1935 to 1941. For most of its life, the mine was the only producer of palladium in the United States and the price of palladium, which varied markedly, was a key factor in the profitability of the mine. During World War II, the U.S. Geological Survey and the U.S. Bureau of Mines studied the deposit in detail, drilled 13 holes, and reinterpreted 7 holes that had been drilled earlier by Solar Development Company (Gault, 1945; Holt and others, 1948; Gault and Wahrhaftig, 1992).

According to Gault (1945), the total production (from incomplete records) from 1907 to to 1941 was about 300,000 tons of ore. The ore averaged 0.9 percent copper, 0.01 ounce of gold per ton, 0.10 ounce of silver per ton, and 0.05 ounce of palladium per ton. In its later years of production under the Alaska Gold and Metals Company, the ore contained 0.94 percent copper, 0.04 ounce of gold per ton, 0.15 ounce of silver per ton, and 0.065 ounce of palladium per ton. Bundtzen and others (1988) indicated that the work by American Platinum Company defined several zones that contain up to 7.8% copper, 0.7 ounce of gold per ton, 0.25 ounce of palladium per ton, and 0.007 ounce of platinum per ton. Maas and others (1995) give the total production of the mine as about 6.2 million pounds of copper, 55,620 ounces of silver, 20,540 ounces of palladium, and 11,740 ounces of gold. According to almost all of the literature, the platinum content of the ore was negligible or not mentioned, but Mertie (1969) indicates that there may have been much more platinum in the ore than is generally recognized.

Reserves:

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Additional comments:

References:

Wright and Paige, 1908; Wright and Wright, 1908; Knopf, 1910; Knopf, 1911; Wright, 1915; Chapin, 1916; Brooks, 1918; Chapin, 1918; Brooks, 1921; Mertie, 1921; Brooks, 1922; Brooks, 1923; Smith, 1926; Davis, 1926; Moffit, 1927; Buddington and Chapin, 1929; Smith, 1929; Smith, 1930 (B 810); Smith, 1930 (B 813); Smith, 1932; Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Smith, 1936; Smith, 1937; Smith, 1938; Smith, 1939 (B 910-A); Smith, 1939 (B 917-A); Smith, 1941; Smith, 1942 (B 933-A); Gault, 1945; Holt and others, 1948; Wedow and others, 1952; Twenhofel, 1953; Sainsbury, 1961; Warner and others, 1961; Bufvers, 1967; Mertie, 1969; Clark and Greenwood, 1972 (PP 800-C, p. C157-160); Page and others,

1973; Cobb, 1978; Nevin and Reader, 1979; Peterson and Stevens, 1981; Eberlein and others, 1983; Payne, 1985; Goodall and Fox, 1988; Bundtzen and others, 1988; Goodall and Fox, 1989; Roppel, 1991; Gault and Wahrhaftig, 1992; Loney and Himmelberg, 1992; Maas and others, 1992; Watkinson and Melling, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Loney and Himmelberg, 1992; Watkinson and Melling, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Stevens

Site type: Prospect

ARDF no.: CR050

Latitude: 55.6200 **Quadrangle:** CR C-2

Longitude: 132.5396

Location description and accuracy:

This prospect is about one mile southeast of the Salt Chuck Mine (CR049). It is near the center of the north boundary of section 21, T. 72 S., R. 84 E. (Early in the history of the Salt Chuck Mine, a claim on that property was called Stevens for the prospector who staked it, but that name has long since fallen out of use at the mine. The same prospector also found the deposit at this site.)

Commodities:

Main: Cu

Other:

Ore minerals: Bornite

Gangue minerals:

Geologic description:

This prospect consists of a small pit and trench that exposes diorite with small stringers and masses of bornite along fractures Some of the fractures also contain aplitic material (Gault, 1945; Sainsbury, 1961; Gault and Wahrhaftig, 1992). The rocks are an extension of the gabbro-pyroxenite-diorite pluton that hosts the Salt Chuck deposit (CR049) about a mile to the northwest; the presence of bornite at this prospect suggests that the deposits are similar. The pluton at the Salt Chuck Mine has been dated at 429 Ma (Loney and others, 1987). See CR049 for a fuller description of this type of deposit at a much better studied locality.

Alteration:

Not noted at this prospect but it is well documented at the geologically similar Salt Chuck deposit (CR049) about a mile to the northwest.

Age of mineralization:

The mineralization is probably related to the emplacement of a 429 Ma gabbro-pyroxenite-diorite pluton.

Deposit model:

Masses and disseminations of bornite in diorite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active

Workings/exploration:

Only a small pit and trench.

Production notes:

Reserves:

Additional comments:

References:

Gault, 1945; Sainsbury, 1961; Loney and others, 1987; Gault and Wahrhaftig, 1992.

Primary reference: Gault and Wahrhaftig, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Copper Center

Site type: Prospect

ARDF no.: CR051

Latitude: 55.6180 **Quadrangle:** CR C-2

Longitude: 132.5063

Location description and accuracy:

The Copper Center propect is about 0.3 mile west of Copper Center Lake, and about 0.6 mile northeast of the center of section 22, T. 72 S., R. 84 E. The workings are shown on Plate 22 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, quartz

Geologic description:

The rocks in the vicinity of the Copper Center prospect are largely covered by glacial drift, alluvium, and dense vegetation. Most that are exposed are greenstone. A single diorite dike is present in the workings but several bodies of diorite crop out a few hundred feet to the south. Several, widely-spaced, small pods and lenses of ore are exposed. Magnetite is dominant and some of the ore is nearly solid magnetite. Pyrite and chalcopyrite are disseminated through the pods and some of the greenstone is altered to garnet and epidote, associated with minor quartz and calcite. One well-defined vein 1 to 3 feet thick is dominated by chalcopyrite. The vein is exposed for about 20 feet and may widen at depth. Dip-needle surveys suggest that there are no large magnetite bodies in the vicinity. Several selected samples of ore contained 4.08 to 4.72 percent copper, 41.05 to 54.40 percent iron, 0.030 to 0.345 ounce of gold per ton, and 0.35 to 2.00 ounces of silver per ton.

The Copper Center prospect has been explored by several pits and trenches and four shallow shafts. Most of the work probably took place before 1915 although there was at least some activity in the 1930's. There is no record of production.

The Copper Center prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:
Some development of garnet-epidote tactite in greenstone.

Age of mineralization:
The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:
Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18d

Production Status: None

Site Status: Probably inactive

Workings/exploration:
The Copper Center prospect has been explored by several pits and trenches and four shallow shafts. Most of the work probably took place before 1915 and there was at least some activity in the 1930's.

Production notes:
There is no record of production.

Reserves:

Additional comments:

References:
Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1912; Wright, 1915; Roehm, 1938 (PE 119-9); Wells and others, 1957; Warner and others, 1961; Bufvers, 1967; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Maas and others, 1992; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Haida; Hyda; Mammoth

Site type: Mine

ARDF no.: CR052

Latitude: 55.6053 **Quadrangle:** CR C-2

Longitude: 132.4921

Location description and accuracy:

The Haida Mine is shown on the USGS 1:63,360-scale topographic map by name. It is about 0.5 mile north of the center of section 26, T. 72 S., R. 84 E. The geology and workings of the Haida Mine are shown on Plate 21 of Warner and others (1961).

Commodities:

Main: Ag, Au, Cu, Fe

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:

Much of the area surrounding the Haida Mine is covered by glacial drift, alluvium, and dense vegetation. The rocks that are exposed consist mainly of fine-grained greenstone; very little intrusive igneous rock is known although there is a diorite dike about 500 feet southwest of the mine (Warner and others, 1961). The deposit consists mostly of magnetite replacing greenstone. Locally the greenstone contains lenses of calcareous sedimentary rocks and is replaced by garnet and epidote. Pyrite and chalcopyrite are disseminated in the magnetite as tiny veinlets. Three small masses of copper-bearing magnetite are known. Samples of this material contain an average of about 33 percent iron, 0.88 percent copper, 0.03 ounce of gold per ton, and 0.2 ounce of silver per ton.

Development of the property began in 1905 and there was a small shipment of ore in 1907. Apparently there has been no work on the property since 1908 (Roppel, 1991). The workings consist of several open cuts, pits, and trenches, a short adit, and two shafts. The workings and the geology of the deposit are shown on plate 21 of Warner and others (1961).

The Haida Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Greenstone and marble are replaced by magnetite, garnet, and epidote.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

The workings consist of several open cuts, pits, and trenches, a short adit, and two shafts. The workings and the geology of the deposit are shown on plate 21 of Warner and others (1961).

Production notes:

Development of the property began in 1905 and there was a small shipment of ore in 1907. Apparently there has been no work on the property since 1908.

Reserves:

None.

Additional comments:

References:

Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Brooks, 1912; Wright, 1915; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Charles

Site type: Prospect

ARDF no.: CR053

Latitude: 55.5929 **Quadrangle:** CR C-2

Longitude: 132.4761

Location description and accuracy:

The Charles prospect is about 1.0 mile southeast of the Haida Mine (CR052) which is shown by name on the USGS 1:63,360-scale topographic mine. The Charles prospect is about 0.5 mile southwest of the center of section 25, T. 72 S., R. 84 E.

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Garnet

Geologic description:

The Charles prospect was discovered in 1907. Little work has been done on it and its geology has only been briefly described. A mineralized body exposed in an open cut consists of chalcopyrite with some magnetite in garnet skarn replacing greenstone (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961). Wright and Wright (1908) reported high (but unspecified) gold and silver values. There is no record of production.

The Charles prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:
Pervasive development of skarn in greenstone.

Age of mineralization:
The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:
Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18d

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Apparently only a small open cut.

Production notes:

Reserves:

Additional comments:

References:
Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Brown and Metzdorf

Site type: Mine

ARDF no.: CR054

Latitude: 55.5882 **Quadrangle:** CR C-2

Longitude: 132.4814

Location description and accuracy:
The Brown and Metzdorf Mine is about 0.7 mile northwest of the Alarm Mine (CR055), which is shown on the USGS 1:63,360-scale topographic map. The Brown and Metzdorf Mine is about 0.3 mile southwest of the northeast corner of section 35, T. 72 S., R. 84 E. The location is accurate. The geology and workings in the area are shown on plates 24 and 25 of Warner and others (1961).

Commodities:

Main: Cu, Fe, Mo

Other:

Ore minerals: Chalcopyrite, magnetite, molybdenite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:
Most of the area in the vicinity of the Brown and Metzdorf mine is covered by vegetation and surficial deposits and the geology is not well known. The rocks north and west of the deposit are mainly greenstone, but marble and garnet-epidote tactite are exposed in several places. The greenstone and tactite are cut by several basalt and andesite dikes. The deposit consists of one or more small pods of high-grade ore comprising pyrite and chalcopyrite in tactite. Molybdenite is present in minor amounts. There is also a small amount of pyrite and chalcopyrite disseminated in the tactite and greenstone.

The deposit was discovered prior to 1908 and Wright (1915) reported that it produced a small amount of ore. The workings consist of several open cuts and trenches, two shafts, and an adit with 225 feet of workings.

The Brown and Metzdorf Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Development of garnet-epidote skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; small

Site Status: Probably inactive

Workings/exploration:

The workings consist of several open cuts and trenches, two shafts, and an adit with 225 feet of workings.

Production notes:

The deposit was discovered prior to 1908 and Wright (1915) reported that it produced a small amount of ore.

Reserves:

None.

Additional comments:

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Wright, 1915; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Alarm

Site type: Mine

ARDF no.: CR055

Latitude: 55.5820 **Quadrangle:** CR C-2

Longitude: 132.4671

Location description and accuracy:

The Alarm Mine is labeled on the USGS 1:63,360-scale topographic map; it is near the center of section 36, T. 72 S., R. 84 E. The geology and workings of the Alarm Mine are shown on Plates 23 and 24 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, pyroxene, quartz

Geologic description:

The Alarm mine is about 800 feet northwest of the much larger and more productive It Mine (CR056). The mines are often described together, they were probably mined together, and they share similar geology. Much of the area of the Alarm Mine is covered by surficial deposits or vegetation. The exposed rocks are mainly marble and garnet-epidote skarn; diorite crops out nearby (Warner and other, 1961; Myers, 1985). A few pods of ore were mined out but some disseminated chalcopyrite in tactite remains. As at the It Mine, the ore was probably in skarn near marble or diorite.

Little is known specifically about the history of the Alarm Mine; prior to 1919, it was probably mined in conjunction with the It Mine. The production, if any, was small. It was developed by a few open cuts and trenches and two short adits. Warner and others (1961, plate 23) and Myers (1985) provide detailed maps of the workings and the geology of the deposit.

The Alarm Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Greenstone and marble are replaced by magnetite, garnet, and epidote.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

The Alarm Mine was developed by a few open cuts and trenches and two short adits. Warner and others (1961, plate 23) and Myers (1985) provide detailed maps of the workings and the geology of the deposit.

Production notes:

Little is known specifically about the history of the Alarm Mine; prior to 1919, it was probably mined in conjunction with the It Mine. The production, if any, was small.

Reserves:

None.

Additional comments:

The patented claims of the Alarm Mine were purchased by the Sealaska Corporation in 1998.

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Wright, 1915; Warner and others, 1961; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961; Myers, 1985

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): It; Reed

Site type: Mine

ARDF no.: CR056

Latitude: 55.5778 **Quadrangle:** CR C-2

Longitude: 132.4648

Location description and accuracy:

The It Mine is located by name on the USGS 1:63,360-scale topographic map; it is about 0.3 mile south of the center of section 36, T. 72 S., R. 84 E. The geology and workings of the It Mine are shown on Plates 23 and 24 of Warner and others (1961).

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, magnetite

Gangue minerals: Calcite, epidote, garnet, pyroxene, quartz

Geologic description:

The metamorphic rocks at the It Mine consist of thick, northwest-trending, bands and lenses of garnet-epidote-quartz-calcite-pyroxene skarn, marble, and greenstone (Warner and others, 1961; Myers, 1985). They have been intruded by a northwest-trending, irregular band of diorite up to about 700 feet wide, and by several basalt, andesite, diabase, and gabbro dikes.

The best ore in the main workings--most of which is mined out--was localized along the contact of skarn and lenses of marble; individual ore shoots have been mined to a depth of about 350 feet. Similar but less extensive ore occurs at the north workings. The ore minerals are mainly pyrite and chalcopyrite. Magnetite is sparse in the mine workings although several small magnetite bodies were found nearby. In his detailed study of the mine, Myers (1985) noted that the skarns are dominated by the association garnet-epidote-quartz-calcite with minor magnetite after platy hematite. The ore has relatively high silver values--greater than 200 parts per million (ppm)--and gold values of less than 10 ppm.

The mine has two groups of workings. The main workings consist of two glory holes, 3 adits, several open cuts, and a few trenches. The north workings, about a quarter of a mile northwest of the main workings, consist of a glory hole, two adits, and numerous pits and trenches. The detailed geology of the mine and locations of the numerous workings are shown on plate 23 of Warner and others (1961) and in Myers (1985).

Development began in 1907 and the first shipment of copper ore was in 1908. Except for two years, the mine produced steadily until 1918, principally by Granby Consolidated Mining, Smelting, and Power Company. About $1,000,000 in copper was produced. Maas and others (1995) give the total production as 2,030 tons of copper, 28,970 ounces of silver, and 4,372 ounces of gold. The average grade of the ore was 3.99 percent copper, 0.0685 ounce of gold per ton, and 0.478 ounce of silver per ton. Granby reportedly mined out the deposit and was unsuccessful in finding any additional ore bodies in spite of extensive diamond drilling.

The Reed prospect nearby is similar (Wright, 1909) and may be part of this mine or the nearby Alarm (CR055) Mine.

The It Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Development of calc-silicate skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

The mine has two groups of workings. The main workings consist of two glory holes, 3 adits, several open cuts, and a few trenches. The north workings, about a quarter of a mile northwest of the main workings, consist of a glory hole, two adits, and numerous pits and trenches. The detailed geology of the mine and locations of the numerous workings are shown on plate 23 of Warner and others (1961) and in Myers (1985). Development began in 1907 and the first shipment of copper ore was in 1908. Except for two years, the mine produced steadily until 1918, principally by Granby Consolidated Mining, Smelting, and Power Company.

Production notes:
About $1,000,000 in copper was produced. Maas and others (1995) give the total production as 2,030 tons of copper, 28,970 ounces of silver, and 4,372 ounces of gold.

Reserves:
Probably none left. Granby Mining, Smelting, and Power Company reportedly mined out the deposit by 1919 and was unsuccessful in finding any additional ore bodies despite extensive diamond drilling.

Additional comments:
The patented claims of the It Mine were purchased by the Sealaska Corporation in 1998.

References:
Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Chapin, 1918; Chapin, 1919; Martin, 1919; Martin, 1920; Brooks, 1921; Buddington and Chapin, 1929; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Maas and others, 1992; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961; Myers, 1985

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (head of Poor Man Creek)

Site type: Occurrence

ARDF no.: CR057

Latitude: 55.5721 **Quadrangle:** CR C-2

Longitude: 132.4445

Location description and accuracy:

This prospect is about a quarter-mile below the mouth of the small lake at the head of Poor Man Creek, near the center of the NE1/4 section 2, T. 73 S., R 85 E.

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Bornite, chalcopyrite, hematite, magnetite, pyrite

Gangue minerals: Calcite, diopside, epidote, garnet, quartz

Geologic description:

This previously unknown mineral occurrence is in an area with few workings other than one old prospect pit (Hedderly-Smith, 1999 [Inventory]) . The rocks in the area are mainly graywacke, calcareous graywacke, greenstone, and marble. The occurrence was found by following up persistent geochemical anomalies marked by high values of arsenic, bismuth, and tungsten. A rock chip sample of a 50-foot-wide zone of epidote-calcite-garnet-quartz skarn and diorite breccia with magnetite, chalcopyrite, bornite, and hematite contained 20 parts per million (ppm) copper, 5.94 percent iron, 0.4 ppm silver, and 20 parts per billion (ppb) gold. A sample from a 30-foot-wide marble skarn with garnet, epidote, pyrite and chalcopyrite contained 1,899 ppm copper, 8.80 percent iron, 0.8 ppm silver, and 1,060 ppb gold. A sample of high-grade garnet-epidote-calcite-diopside skarn with about 3 percent pyrite and 2 percent chalcopyrite contained 1.19 percent copper, 18 percent iron, 5.0 ppm silver, and 0.410 ppm gold.

This occurrence is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: None

Site Status: Active?

Workings/exploration:

At least one old prospect pit.

Production notes:

Reserves:

Additional comments:

This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Anzman, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Poorman; Copper King; Morning Star; Blackbird; Kansas

Site type: Mine

ARDF no.: CR058

Latitude: 55.5582 **Quadrangle:** CR C-2

Longitude: 132.4359

Location description and accuracy:
The Poor Man Mine is shown on the USGS 1:63,360-scale topographic map; it is about 0.6 mile northwest of the center of section 12, T. 73 S., R. 85 E. The geology and workings are the Poorman Mine are shown on plates 12 to 15 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:
The Poorman deposit is in greenstone containing layers of quartzite and graywacke and lenses of marble, all intruded by a multitude of dikes of intermediate to basic composition. The rocks are cut by a series of north-trending, en echelon faults. The deposit is essentially a magnetite lens about 100 feet wide and 1,500 feet long at the surface; the lens lies along one of the faults and dips 60-80W. The magnetite body contains less than 10 percent pyrite and chalcopyrite; the chalcopyrite usually occurs in a network of quartz-calcite veinlets in the magnetite. About 10 percent of the deposit consists of fragments of altered greenstone and dike material. The mineralization appears to preferentially replace shattered greenstone. The magnetite lens is bordered by several feet of lower-grade material containing disseminated chalcopyrite, pyrite, and magnetite.
The deposit was originally developed as a copper prospect, but since WWII has mainly been considered to be a high-grade iron deposit with copper values. It has been explored by 3 short adits, 4 shafts, and numerous pits and trenches. During World War II, the U.S. Bureau of Mines diamond drilled 13 holes and delineated the full extent of the body by a dip-needle survey. In recent years, the deposit has been drilled as part of a patent application process, and the drilling has revealed additional shallow magnetite bodies.
Holt and Sanford (1946) estimate that the deposit contains about 900,000 tons of measured and indicated ore and 450,000 tons of inferred ore. The body averages 52.4 percent iron, 0.25 percent copper, 0.032 ounce of gold per ton, and 0.071 ounce of silver per ton.
The Morning Star, Blackbird, and Copper King are old prospects nearby (Brooks, 1902; Chapin, 1916) that probably became part of the Poorman property.
The Poorman prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subse-

quently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Development of calc-silicate skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: None

Site Status: Active

Workings/exploration:

The property has been explored by 3 short adits, 4 shafts, and numerous pits and trenches. During World War II, the U.S. Bureau of Mines diamond drilled 13 holes and delineated the full extent of the ore body by a dip-needle survey. In 1989 and 1990, the claims were being drilled as part of an application for patent, and the drilling revealed additional magnetite bodies. In 1998, three claims were patented.

Production notes:

Reserves:

Holt and Sanford (1946) estimate that the deposit contains about 900,000 tons of measured and indicated ore and 450,000 tons of inferred ore. The body averages 52.4 percent iron, 0.25 percent copper, 0.032

ounce of gold per ton, and 0.071 ounce of silver per ton. Drilling in 1989 and 1990 as part of an application for patent discovered several additional magnetite bodies.

Additional comments:

The surrounding area consists of land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Wright, 1915; Chapin, 1916; Smith, 1917 (B 153); Brooks, 1921; Buddington and Chapin, 1929; Holt and Sanford, 1946; Wells and others, 1957; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Iron King; Iron King No. 1

Site type: Prospects

ARDF no.: CR059

Latitude: 55.5452 **Quadrangle:** CR C-2

Longitude: 132.4248

Location description and accuracy:

The Iron King prospects are about 0.4 mile north-northwest of Sunny Hat Point, and about 0.5 mile west-southwest of the northeast corner of section 13, T. 73 S., R. 85 E. The geology and workings at the Iron King prospects are shown on figure 32 of Warner and others (1961).

Commodities:

Main: Au, Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:

The Iron King prospect is in folded and metamorphosed greenstone that is cut by northeast- and north-trending dikes of basalt, andesite, and dacite (Warner and others, 1961). Near the deposit, the greenstone is epidotized. The deposit is an irregular zone about 150 feet long and 10-15 feet wide that trends about N15 E and dips 64NW; it is probably localized along a fault. Magnetite locally makes up 50 percent of the mineralized zone, and chalcopyrite, pyrite, and magnetite are disseminated widely in it. The U.S. Bureau of Mines diamond drilled four holes which did not cut mineralization; their surface sampling indicates that the mineralized zone contains about 2 percent copper. The deposit has been explored by several trenches and prospect pits; most of the area is covered by glacial drift, alluvium, and vegetation.

Recent sampling shows an unusually high gold content in the deposit. Hedderly-Smith (1999 [Inventory]) cites a high-grade sample with over 10 percent copper and 37 percent iron, that contained 19.3 parts per million (ppm) gold, and 79.5 ppm silver. Several other samples across 17 feet of old trench contained 0.246 to to 0.301 ounce of gold per ton and 13.8 to 20.7 ounces of silver per ton. These and other samples contained 2.22 to 3.68 percent copper, and 31.2 to 50.97 percent iron. Hedderly-Smith (1999 [Inventory]) estimates that the deposit has one or more million tons of material that contains 2 to 4 percent copper, one-quarter of an ounce of gold per ton, and more than 35 percent iron.

The Iron King prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Greenstone is altered to epidote. Development of calc-silicate skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: None

Site Status: Active

Workings/exploration:

The deposit has been explored by several trenches and prospect pits. During WW II, the U.S. Bureau of mines diamond drilled 4 holes that did not cut mineralization. Recent sampling shows an unusually high gold content in the deposit. Hedderly-Smith (1999 [Inventory]) cites a high-grade sample with over 10 percent copper and 37 percent iron, that contained 19.3 parts per million (ppm) gold, and 79.5 ppm silver. Several other samples across 17 feet of old trench contained 0.246 to to 0.301 ounce of gold per ton and 13.8 to 20.7 ounces of silver per ton. These and other samples contained 2.22 to 3.68 percent copper, and 31.2 to 50.97 percent iron.

Production notes:

Reserves:

Hedderly-Smith (1999 [Inventory]) estimates that the deposit has one or more million tons of material that contains 2 to 4 percent copper, one-quarter of an ounce of gold per ton, and more than 35 percent iron.

Additional comments:

The Iron King prospects are on or surrounded by land whose subsurface rights are held by the Sealaska Corporation.

References:

Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Copper Queen

Site type: Prospect

ARDF no.: CR060

Latitude: 55.5388 **Quadrangle:** CR C-2

Longitude: 132.3839

Location description and accuracy:

The Copper Queen prospect is noteworthy for being the first claim staked in Alaska, although little if any work has been done since before WW I (Wright and Wright, 1908). The prospect is about 0.5 mile northeast of triangulation station Ann and about 0.7 mile east of the town of Kasaan. It is at an elevation of about 650 feet, and about 0.4 mile west-southwest of the center of section 17, T. 73 S., R. 86 E.

Commodities:

Main: Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:

The Copper Queen prospect is noteworthy for being the first lode claim staked in Alaska (Wright and Wright, 1908). It was staked in 1867 and there was intermittent interest in the property through the 1880's (Roppel, 1991). Perhaps the first serious development began in 1900 and there was activity through about 1906. At least three adits were driven and there was a total of about 500 feet of underground workings. It is unlikely that any ore was produced and there is little mention of any activity on the property after 1907. Wright and Wright (1915) describe the deposit as an irregular mass of chalcopyrite with pyrite and magnetite in garnet-epidote tactite at the contact between altered greenstone and syenite (probably diorite).

The Copper Queen prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Development of calc-silicate skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status:

Site Status:

Workings/exploration:

The Copper Queen prospect is noteworthy for being the first lode claim staked in Alaska. It was staked in 1867 and there was intermittent interest in the property through the 1880s. Perhaps the first serious development began in 1900 and there was activity through about 1906. At least three adits were driven and there was a total of about 500 feet of underground workings.

Production notes:

Probably none.

Reserves:

Additional comments:

The prospect is located on patented claims. The surrounding area is land whose subsurface rights are held by the Sealaska Corporation.

References:

Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1992; Anzman, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Maas and others, 1995; Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright, 1915

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Uncle Sam; Elm City

Site type: Mine

ARDF no.: CR061

Latitude: 55.5327 **Quadrangle:** CR C-2

Longitude: 132.3752

Location description and accuracy:

The location of the Uncle Sam Mine is shown on the USGS 1:63,360-scale topographic map. The mine is near the center of the south boundary of section 17, T. 73 S., R. 86 E.

Commodities:

Main: Cu, Fe

Other: Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:

The rocks in the vicinity of the Uncle Sam Mine are intensely altered greenstone and sedimentary rocks cut by dacite, granodiorite, and diabase dikes (Wright and Wright, 1908; Warner and others, 1961; Maas and others, 1995). The deposit consists of several irregular masses of chalcopyrite, pyrite, and magnetite in a gangue of epidote, garnet, and calcite. The main ore body is cut off by a steep east-trending fault.

The Uncle Sam Mine was discovered in 1899; some ore was produced prior to 1902 but did not return the cost of mining (Roppel, 1991). About 350 tons of ore were shipped in 1906; this ore returned $22 a ton. The mine closed in the fall of 1907 (Wright and Wright, 1908). Maas and others (1995) indicate that the mine produced 12 metric tons of copper. The workings include an open pit and about 800 feet of underground workings from three adits. The workings are shown in detail on figure 15 of Maas and others (1995).

The Elm City and Skookum claims are near the Uncle Sam Mine (Brooks, 1902). A short tunnel on those claims exposes pyrite and chalcopyrite in a zone 3 feet wide; the ore is reported to contain a half ounce of gold per ton.

The Uncle Sam Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Greenstone and sedimentary rocks are intensely altered; formation of skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; small

Site Status: Active

Workings/exploration:

The workings include an open pit and about 800 feet of underground workings from three adits. The workings are shown in detail on figure 15 of Maas and others (1995).

Production notes:

The deposit was discovered in 1899; some ore was produced prior to 1902 but did not return the cost of mining (Roppel, 1991). About 350 tons of ore were shipped in 1906; this ore returned $22 a ton. The mine closed in the fall of 1907. Maas and others (1995) indicate that the mine produced 12 metric tons of copper.

Reserves:

None.

Additional comments:

The Uncle Sam Mine is on or is surrounded by land whose subsurface rights are held by the Sealaska Corporation.

References:

Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Roppel, 1991; Myers, 1985; Roppel, 1991; Bond, 1993; Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Kasaan Mountain)

Site type: Prospects

ARDF no.: CR062

Latitude: 55.5428 **Quadrangle:** CR C-2

Longitude: 132.3612

Location description and accuracy:
The location of these prospects is uncertain other than that they are in the vicinity of Kasaan Mountain. For this record, the site is arbitrarily plotted at the top of Kasaan Mountain in the NW1/4 section 16, T. 73 S., R. 86 E. The prospects may be a mile or more from this location.

Commodities:

Main: Ag, Au, Pb

Other: Ba

Ore minerals: Chalcopyrite, galena, sphalerite, tetrahedrite

Gangue minerals: Barite, calcite, quartz

Geologic description:
Wright (1915) mentions vein deposits 1 to 5 feet wide that were prospected at some uncertain location on Kasaan Mountain. They are distinctly different from the many Cu-Fe skarn deposits on the Kasaan Peninsula in that the veins contain galena, tetrahedrite, sphalerite, and chalcopyrite; the gangue is quartz, calcite, and barite, and the veins were valued for their lead, silver, and gold content. No other information is available. A large Silurian or Ordovician diorite pluton is exposed north of Kasaan Mountain and the layered rocks in the vicinity consist of Silurian or Ordovician andesite and metasedimentary rocks (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
The veins are younger than the Silurian or Ordovician host rocks.

Deposit model:
Quartz vein with lead, silver, and gold.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
None mentioned.

Production notes:

Reserves:

Additional comments:
The Sealaska Corporation holds the subsurface rights to the land in the vicinity of Kasaan Mountain.

References:
Wright, 1915; Eberlein and others, 1983; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright, 1915

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Rich Hill

Site type: Mine

ARDF no.: CR063

Latitude: 55.5254 **Quadrangle:** CR C-2

Longitude: 132.3457

Location description and accuracy:

The Rich Hill Mine is shown by name on the USGS 1:63,360-scale topographic map. It is about 0.2 mile east of the center of section 21, T. 73 S., R. 86 E. The geology and workings at the Rich Hill Mine are shown on Plates 26 to 28 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calc-silicate skarn

Geologic description:

The host rocks at the Rich Hill mine are mainly greenstone and interbedded sedimentary rocks that have been pervasively altered to tactite (Warner and others, 1961). These rocks are cut by numerous dikes of varying composition including dacite, diorite, gabbro, basalt, andesite, and diabase, most of which trend north or northwest. The largest dike, up to 50 feet thick, is diorite porphyry that can be traced for more than a quarter-mile. There are several lenses of magnetite nearby.

Most of the mineralization consists of disseminated chalcopyrite, pyrite, and magnetite in tactite, but there are local high-grade pods of chalcopyrite-rich material with little magnetite (Warner and others, 1961). The mineralization appears to be stratabound. Some of the high-grade portions seem to be preferentially aligned along northwest-trending faults and concentrated along chemically more reactive sedimentary rock layers. The main ore body consisted of a mass of chalcopyrite-rich ore along a fault zone that dips N77E and dips 80N to vertical. Warner and others (1961) have defined four zones of mineralization: Zone 1 is about 140 feet wide and exposed for about 500 feet; Zone 2 is about 100 feet wide and about 1,200 feet long; Zone 3 is about 500 feet long and about 160 feet wide; and the size of Zone 4 is indeterminate. Warner and others estimate that about two-thirds of the rock in these zones is waste and the rest contains about 1 percent copper. A block of ore about 100 feet long, 35 feet wide, and 80 feet deep remains; several samples indicate that it runs 1.4 to 2 percent copper.

The workings consist of three adits, many trenches and open cuts, and a small, shallow, glory hole that have developed the mine over a vertical extent of about 120 feet. Granby Consolidated Mining Company shipped a small tonnage of ore in 1917 and 1918 and is reputed to have mined a considerable tonnage of high-grade, chalcopyrite-rich ore in 1928. Maas and others (1995) indicate that the total production was 47 tons of copper, 514 ounces of silver, and 77 ounces of gold. Hedderly-Smith (1999 [Inventory]) cites samples that contained 2 to 3 percent copper and 500 to 1,300 parts per billion (ppb) gold; Maas and others (1995) cite a sample that contained 6.15 percent copper, 12,439 ppb gold and 43.5 parts per million silver.

The Rich Hill Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of tactite in greenstone and sedimentary rocks.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; small

Site Status: Active

Workings/exploration:

The workings consist of three adits, many trenches and open cuts, and a small, shallow, glory hole that have developed the deposit over a vertical extent of about 120 feet.

Production notes:

Granby Consolidated Mining Company shipped a small tonnage of ore in 1917 and 1918 and is reputed to have mined a considerable tonnage of high-grade chalcopyrite-rich ore in 1928. Maas and others (1995) indicate that the total production was 47 tons of copper, 514 ounces of silver, 77 ounces of gold.

Reserves:

Warner and others (1961) have defined four zones of mineralization: Zone 1 is about 140 feet wide and exposed for about 500 feet; Zone 2 is about 100 feet wide and about 1,200 feet long; Zone 3 is about 500 feet long and about 160 wide; and the size of Zone 4 is indeterminate. They estimate that about two-thirds of the rock in these zones is waste and the rest contains about 1 percent copper. A block of ore about 100 feet long, 35 feet wide, and 80 feet deep remains; several samples indicate that it contains 1.4 to 2 percent copper.

Additional comments:

The Rich Hill Mine is on or surrounded by land whose subsurface rights are held by the Sealaska Corporation.

References:

Wright and Wright, 1908; Wright, 1909; Wright, 1915; Chapin, 1919; Martin, 1919; Martin, 1920; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Tacoma; Peacock

Site type: Prospects

ARDF no.: CR064

Latitude: 55.5212 **Quadrangle:** CR C-2

Longitude: 132.3366

Location description and accuracy:
The Tacoma and Peacock claims are about 0.5 mile southeast of the Rich Hill Mine (CR063) and about 0.3 mile north of triangulation station Cole. The claims are about about 0.5 mile southeast of the center of section 21, T. 73 S., R. 86 E.

Commodities:

Main: Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite, molybdenite

Gangue minerals: Epidote, garnet

Geologic description:
The Tacoma claim contains small, irregular, contact-metamorphic deposits that consist of chalcopyrite, magnetite, and minor molybdenite, in garnet-epidote rock (Warner and others, 1961). The deposit is exposed on the beach and in a 60-foot adit. The Peacock claim extends north from the Tacoma claim. At an elevation of about 120 feet, a 45-foot-long tunnel cuts a belt of garnet-epidote rock that contains magnetite and minor chalcopyrite. At an elevation of about 325 feet, an adit 30 feet long exposes similar garnet-epidote rock adjacent to a diabase dike. Wright and Wright (1906) reported that considerable ore had been mined from one or both of the claims and was awaiting shipment.

The Peacock and Tacoma claims contain several small prospects similar to many of the other copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:
Pervasive development of tactite.

Age of mineralization:
The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:
Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18d

Production Status:

Site Status: Active

Workings/exploration:
Explored by several pits and two adits.

Production notes:
Wright and Wright (1906) reported that considerable ore had been mined from one or both of the claims and was awaiting shipment. However, there is no indication that the ore was actually shipped.

Reserves:
None.

Additional comments:
These old claims are on or surrounded by land whose surface rights are held by the Sealaska Corporation.

References:
Wright and Wright, 1906; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Big Five

Site type: Prospect

ARDF no.: CR065

Latitude: 55.6523 **Quadrangle:** CR C-2

Longitude: 132.4037

Location description and accuracy:

As described by Warner and others (1961), the Big Five prospect is about 4,600 feet N65W of Tolstoi Mountain at an elevation of about 250 feet. However, the contours on their map do not coincide well with the modern USGS 1:63,360-scale topographic map. For this record, the prospect is in the SE1/4 section 5, T, 72 S., R. 85 E. The geology and workings in the area are shown on plate 16 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite, pyrrhotite

Gangue minerals:

Geologic description:

The Big Five is a small, old prospect northwest of Tolstoi Mountain. The deposit was explored by a 40-foot adit with a 15-foot winze, probably before 1908. There is no record of production and little evidence of more recent work. The deposit is in impure limestone near the contact of a northwest-trending diorite dike (Warner and others, 1961, plate 16). Near the diorite, the limestone has been altered to tactite. The deposit consists of small pods and stringers of pyrrhotite with magnetite and chalcopyrite.

The Big Five prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Limestone is altered to tactite near diorite body.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The Big Five is a small, old prospect northwest of Tolstoi Mountain. The deposit was explored by a 40-foot adit with a 15-foot winze, probably before 1908.

Production notes:

There is no record of production.

Reserves:

Additional comments:

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Iron Cap

Site type: Prospects

ARDF no.: CR066

Latitude: 55.6490 **Quadrangle:** CR C-2

Longitude: 132.3914

Location description and accuracy:

The center of the area that contains the Iron Cap prospects is about 0.4 mile northwest of the top of Tolstoi Mountain and about 0.5 mile south of the center of section 4, T. 72 S., R. 85. The workings and geology of the Iron Cap and nearby prospects are shown on plate 17 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite, pyrrhotite

Gangue minerals: Calcite, chlorite, diopside, epidote, garnet, hornblende, quartz

Geologic description:

The rocks in the vicinity of the Iron Cap prospects consist mainly of greenstone and clastic sedimentary rocks interlayered with limestone. The area is cut by a multitude of closely spaced, northeast-trending, nearly vertical dikes of diorite, granodiorite, diabase, basalt, and andesite. There is a major fault southwest of the prospects that can be traced for at least three miles. About 1,500 feet to the northeast, there is a contact with a large granodiorite body that postdates the dikes. The geology of the area and the location of the workings are shown in detail by Warner and others (1961, plate 17).

The deposit crops out in an area of about 1,000 by 2,000 feet, but most of the mineralization is confined to an area of about 150 by 200 feet delineated by numerous trenches. The mineralization consists of pods and lenses as much as 200 feet long and 20 to 30 feet thick of magnetite with subordinate pyrite and chalcopyrite. A few of the lenses consist largely of pyrite, pyrrhotite, and chalcopyrite, with subordinate magnetite. The ore bodies preferentially replace what was probably calcareous shale or sandstone (as distinct from the greenstone) and are roughly conformable to the layering. The ore bodies are associated with tactite composed of diopside, andradite garnet, hornblende, epidote, and blue-green chlorite, and are cut by late veinlets of quartz and calcite.

The Iron Cap prospect was explored around 1900 by an adit about 100 feet long, by numerous pits and trenches, and, in 1901, by several hundred feet of drilling (Brooks, 1902). During WW II, the U.S. Bureau of Mines drilled the deposit , collected numerous samples, and carried out a dip needle survey (Erickson, 1948). The dip-needle survey suggested that the ore bodies are shallow and do not extend outside the area of the known magnetite lenses. However, the American Copper and Nickel Company recently commissioned an aerial geophysical [aeromagnetic?] survey that located several strong anomalies in the area (Anzman, 1998; Hedderly-Smith, 1999 [Inventory]). The work by the Bureau of Mines defined about 90,000 metric tons of reserves with 40 percent iron, 0.25 percent copper, and trace gold and silver (Erickson, 1948; Warner and others, 1961; Maas and others, 1995).

The Iron Cap prospect is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Development of calc-silicate skarn.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Undetermined.

Site Status: Active

Workings/exploration:

The Iron Cap prospect was explored around 1900 by an adit about 100 feet long, by numerous pits and trenches, and, in 1901, by several hundred feet of drilling (Brooks, 1902). During WW II, the U.S. Bureau of Mines drilled the deposit , collected numerous samples, and carried out a dip needle survey (Erickson, 1948). The dip-needle survey suggested that the ore bodies are shallow and do not extend outside the area of the known magnetite lenses. However, the American Copper and Nickel Company recently commissioned an aerial geophysical [aeromagnetic?] survey that located several strong anomalies in the area

(Anzman, 1998; Hedderly-Smith, 1999 [Inventory]).

Production notes:

Reserves:

The work by the Bureau of Mines defined about 90,000 metric tons of reserves with 40 percent iron, 0.25 percent copper, and trace gold and silver (Erickson, 1948; Warner and others, 1961; Maas and others, 1995).

Additional comments:

References:

Brooks, 1902; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Roehm, 1941 (PE 119-19); Erickson, 1948; Warner and others, 1961; Cobb, 1978; Maas and others, 1992; Eberlein and others, 1983; Glavinovich, 1987; Myers, 1985; Roppel, 1991; Bond, 1993; Hedderly-Smith, 1993 (1992 season); Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north of Tolstoi Mountain)

Site type: Occurrence

ARDF no.: CR067

Latitude: 55.6508 **Quadrangle:** CR C-2

Longitude: 132.3802

Location description and accuracy:
This occurrence is a few hundred feet southeast of the outlet of a small lake about 0.4 mile north of Tolstoi Mountain. It is in the SE1/4 section 4, T. 72 S., R. 85 E. The geology and workings in the area are shown on plate 16 of Warner and others (1961).

Commodities:

Main: Au?

Other: As

Ore minerals: Arsenopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
This occurrence was first described by Warner and others (1961). The deposit consists of a vein about 4 inches thick that is exposed for about 8 feet; it strikes N50W and dips 60SW. It consists of stringers of pyrite and arsenopyrite in brecciated quartz, and may contain gold. The rocks in the vicinity are part of a large Silurian or Ordovician granodiorite stock.

Alteration:

Age of mineralization:
The vein cuts Silurian or Ordovician granodiorite.

Deposit model:
Gold?-quartz vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:
Warner and others, 1961; Cobb, 1978.

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Wallace; Muckers Dream; Tolstoi

Site type: Prospect

ARDF no.: CR068

Latitude: 55.6400 **Quadrangle:** CR C-2

Longitude: 132.3775

Location description and accuracy:

There are several deposits at this site that are unnamed or described under different names. Several of descriptions are probably of the same deposit but some of the locations are not precise and it is unclear how many different deposits are present. See the 'Geologic description' field for the locations of the individual deposits. The site is somewhat arbitrarily plotted about 0.4 mile east-southeast of the center of section 9, T. 72 S., R. 85 E., about 0.5 mile southeast of Tolstoi Mountain. Several of the deposits are probably quite close to this location and all are probably with a mile. The geology and workings in the area are shown on plates 16 and 17 of Warner and others (1961).

Commodities:

Main: Au, Cu, Fe

Other:

Ore minerals: Chalcopyrite, hematite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, quartz

Geologic description:

Warner and others (1961) describe a quartz vein with magnetite and chalcopyrite about 2,500 feet S25E from Tolstoi Mountain. The vein is exposed in a stream along a major fault zone. The vein consists of vuggy quartz with chalcopyrite in the vugs. The vein has been explored by an adit that follows the vein for about 20 feet until it feathers out into small stringers. The rocks in the area consist largely of conglomerate, calcareous siltstone and sandstone, and greenstone, cut by many diorite dikes. This is probably near the Wallace Group that Wright and Wright (1908) describe as containing small, scattered masses of garnet-epidote rock with chalcopyrite and magnetite and which has been explored by at least one adit. Hedderly-Smith (1999 [Inventory]) describes adits, some trenches, and a dump between about 1,150 and 1,220 feet elevation in this vicinity. Several samples of float and dump rock contained up to 8.9 percent copper, 44.6 percent iron, 40.6 parts per million (ppm) silver, and 3.8 ppm gold.

Roehm (1938 [PE 119-14]) describes the Mucker's Dream Group, a prospect about two miles north of Windfall Harbor; it is probably in this area. The workings consist of trenches at elevations of about 740 and 920 feet; a 55-foot adit with a 15-foot crosscut at an elevation of about 1,200 feet; and a long trench, an adit, and a shaft at an elevation of about 1,240 feet. The original discovery was in 1914. In 1916, 10 tons of ore returned $85 in gold per ton; a 3-ton shipment in 1922 also returned $85 in gold per ton. The property was still being worked in 1938. The rocks in the area consist mainly of greenstone and the deposits are along a major N30-35W fault that is probably the same fault that Warner and others (1961, plate 16) show west of Tolstoi Mountain. In one adit, a 12-inch quartz vein with chalcopyrite, pyrite, hematite, and magnetite contained 0.02 ounce of gold per ton. In another adit, high-grade copper-gold ore in a quartz vein cuts garnet-epidote rock. A sample of this vein contained 0.68 ounce of gold per ton and 1.40 ounces of silver per ton. The higher-grade ore in these quartz veins reportedly was similar to the ore in the contact metamorphic copper deposits of the Kasaan Peninsula.

Wright and Wright (1908) describe the Tolstoi Group of claims, which are south of the Wallace Group, just below the summit of Tolstoi Mountain. The ore bodies are low-grade magnetite-chalcopyrite masses similar to those at the Iron Cap prospect (CR066).

These prospects are probably related in origin and geologic setting to the numerous copper-iron deposits on the Kasaan Peninsula, although they are among the few where gold-quartz veins are specifically mentioned. The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:
Extensive development of skarn.

Age of mineralization:
The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:
Gold-quartz vein and Cu-Fe skarn (Cox and Singer, 1986; models 18d and 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18d, 36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

Several to many adits and trenches depending on the number of different deposits that are included in this site.

Production notes:

Reserves:

Additional comments:

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Roehm, 1938 (PE 119-14); Warner and others, 1961; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Hedderly-Smith, 1993 (1992 season); Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Sunny Day

Site type: Prospect

ARDF no.: CR069

Latitude: 55.5117 **Quadrangle:** CR C-2

Longitude: 132.4228

Location description and accuracy:

The location for this old prospect described by Wright and Wright (1908) is vague. However, Sainsbury (1961) found a tunnel at the location used for this site that is probably the old prospect. It is about 0.8 mile west- southwest of Baker Point, and about 0.1 mile northeast of the center of section 25, T. 73 S., R. 85 E.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Quartz

Geologic description:

The deposit at this old prospect is a (quartz?) vein that contains chalcopyrite and low gold and silver values; the vein strikes N65E and has a vertical dip (Wright and Wright, 1906; Wright, 1907; Wright and Wright, 1908). The vein is in highly metamorphosed greenstone with marble bands and 'bosses' of diorite, and follows one wall of a wide porphyry dike. The greenstone and marble are part of the Silurian and Ordovician, Descon Formation and the prospect is near a small Cretaceous(?) granitic body near Point Baker (Eberlein and others, 1983; Brew, 1996). An attempt was made to undercut the vein with a 135-foot tunnel that apparently did not reach it. Sainsbury (1961) identified the material on the dump of the tunnel as pyritized greenstone with specks of magnetite; he saw no copper minerals.

Alteration:

Age of mineralization:

Unknown, other than that the vein is in Silurian or Ordovician greenstone and marble. The deposit may be related to a nearby Cretaceous(?) intrusion.

Deposit model:

Vein with low silver and gold values.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

The vein was undercut by a 135-foot tunnel that apparently did not reach it.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1906; Wright, 1907; Wright and Wright, 1908; Sainsbury, 1961; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Sainsbury, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Baker Point)

Site type: Occurrence

ARDF no.: CR070

Latitude: 55.5071 **Quadrangle:** CR C-2

Longitude: 132.4107

Location description and accuracy:
This occurrence is at or near sea level, about 0.6 mile south of Baker Point and 0.2 mile north-northeast of the southwest corner of section 30, T. 73 S., R. 86 E. The location is accurate.

Commodities:

Main: Fe

Other:

Ore minerals: Magnetite

Gangue minerals:

Geologic description:
This occurrence consists of magnetite layers and lenses up to several inches thick in banded chert and argillite that is interbedded with a pyroxene-bearing flow or dike (Sainsbury, 1961). Deformed limestone, banded chert, and calcareous argillite crop out to the south. The rocks are probably part of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). Several samples collected by Maas and others (1992, 1995) contained up to 72.13 percent iron but insignificant amounts of other metals.

Alteration:

Age of mineralization:
Magnetite layers and lenses in metamorphosed, Silurian or Ordovician sedimentary and volcanic rocks.

Deposit model:
Magnetite layers in metamorphosed volcanic and sedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only sampling by government geologists.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury, 1961; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Sainsbury, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Mount Andrew

Site type: Mine

ARDF no.: CR071

Latitude: 55.5167 **Quadrangle:** CR C-1

Longitude: 132.3021

Location description and accuracy:

The location of the Mount Andrew Mine is shown on the USGS 1:63,360-scale topographic map. It is about 0.5 mile north-northwest of the center of section 26, T. 73 S., R. 86 E. The extensive surface and underground workings of the Mount Andrew Mine and the geology of the mine area are shown on plates 7 to 11 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, hornblende

Geologic description:

The Mount Andrew is one of the principal mines on the Kasaan Peninsula (Wright and Wright, 1908; Wright, 1915; Wright and Tolonen, 1947; Warner and others, 1961; Maas and others, 1995; Hedderly-Smith, 1999 [Inventory]). The host rocks are mainly greenstone, largely altered to tactite composed of garnet, epidote, and hornblende, and scattered small marble lenses. The dominant structure in the deposit is a syncline that outcrops over an area at least 600 feet long and 550 feet wide, and exposes about 550 feet of layered rocks. The syncline trends about N10W. Nearly half the rock in the syncline is massive magnetite in conformable layers or mantos a few feet to 50 feet thick, interlayered with the greenstone. The greenstone and magnetite layers are cut by numerous north-trending, steeply dipping dikes of alkalic granodiorite, gabbro, andesite, and diorite porphyry. Pyrite and chalcopyrite are disseminated widely in the tactite and magnetite; there were probably local concentrations of chalcopyrite-rich ore, but most such high-grade pockets were probably mined prior to 1919.

The Mount Andrew Mine comprises three adits, 4 glory holes, several winzes, and a sublevel, to a depth of about 250 feet. The geology and workings are shown in detail on plates 7 to 11 of Warner and others (1991). The deposit was discovered in 1898 and the first ore was shipped in 1906 to the Tacoma smelter (Wright and Wright, 1915; Warner and others, 1961; Roppel, 1991). There was intermittent production until 1918, but none since. In 1944, the U.S. Bureau of Mines trenched the deposit and drilled 14 holes. The U.S. Geological Survey mapped the deposit in detail from 1942 to 1944. Utah Construction and Mining did geologic mapping and geophysical surveys in 1957 and drilled the deposit from 1960 to 1962 and in 1968. The property is still (2004) active and exploration on it continues.

There have been several estimates of the remaining resources in the Mount Andrew, Stevenstown (CR072), and Mamie (CR073) mines. Warner and others (1961) and Wright and Tolonen (1947) estimate a collective resource of 2,684,000 long tons of ore, of which about 80 percent is in the Mount Andrew deposit. The weighted average grade of this resource is 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tolonen, 1947). Twenhofel (1953) estimated that about 3,500,000 tons of ore remain in the deposits. Carr and Dutton (1959) estimated that the deposits still contain about 2.3 million tons of indicated magnetite ore with 50 percent iron, and 0.91 million tons of inferrred ore. The total production from the Mount Andrew, Stevenstown, and Mamie mines from 1905 to 1918 was about 270,000 tons of ore with an average grade of 2.37 percent copper, and 0.026 ounce of gold and 0.212 ounce of silver per ton (Warner and others, 1961). Little copper-rich ore such as was mined prior to 1919 probably remains.

Warner and others (1961) and Maas and others (1995) describe several geologically similar, small deposits east of the Mount Andrew Mine. They were originally under the same management as the Mount Andrew Mine and some produced small amounts of ore. These include the Peacock, Rico, North Star, Glory, and Good Luck claims, and the Good Luck-Mayflower group.

The Mount Andrew Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of tactite.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

The Mount Andrew Mine comprises three adits, 4 glory holes, several winzes, and a sublevel, to a depth of about 250 feet. The geology and workings are shown in detail on plates 7 to 11 of Warner and others (1991). The deposit was discovered in 1898 and the first ore was shipped in 1906 to the Tacoma smelter (Wright and Wright, 1915; Warner and others, 1961; Roppel, 1991). There was intermittent production until 1918, but none since. In 1944, the U.S. Bureau of Mines trenched the deposit and drilled 14 holes. The U.S. Geological Survey mapped the deposit in detail from 1942 to 1944. Utah Construction and Mining did geologic mapping and geophysical surveys in 1957 and drilled the deposit from 1960 to 1962 and in 1968. The property is still (2004) active and exploration on it continues.

Production notes:

No figures are available solely for the production of the Mount Andrew Mine. However, the cumulative production from it and the nearby Stevenstown (CR072) and Mamie (CR073) mines from 1905 to 1918 was about 270,000 tons of ore with an average grade of 2.37 percent copper, and 0.026 ounce of gold and 0.212 ounce of silver per ton (Warner and others, 1961).

Reserves:

There have been several estimates of the remaining resources of the Mount Andrew, Stevenstown (CR72), and Mamie (CR73) mines. Warner and others (1961) and Wright and Tolonen (1947) estimate a collective resource of 2,684,000 long tons of ore, of which about 80 percent is in the Mount Andrew deposit. The weighted average grade of this resource is 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tolonen, 1947). Twenhofel (1953) estimated that about 3,500,000 tons of ore remain in the deposits. Carr and Dutton (1959) estimated that the deposits still contain about 2.3 million tons of indicated magnetite ore with 50 percent iron, and 0.91 million tons of inferrred ore. Little copper-rich ore such as was mined prior to 1919 probably remains.

Additional comments:

The Mount Andrews Mine is covered by patented claims. The Sealaska Corporation holds the subsurface rights to the land around it.

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Brooks, 1912; Brooks, 1913; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Buddington and Chapin, 1929; Thorne and others, 1945; Wright and Tolonen, 1947; Twenhofel, 1953; Carr and Dutton, 1959; Mount Andrew Mining Company, 1960; Warner and others, 1961; Bufvers, 1967; Nordine, 1972; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Maas and others, 1992; Anzman, 1995; Maas and others, 1995; Brew, 1996; Bond, 1993; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Stevenstown

Site type: Mine

ARDF no.: CR072

Latitude: 55.5173 **Quadrangle:** CR C-1

Longitude: 132.2882

Location description and accuracy:
The location of the Stevenstown Mine is shown on the USGS 1:63,360-scale topographic map. The mine is near the northeast corner of section 26, T. 73 S., R. 86 E.

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, hornblende

Geologic description:
The rocks at the Stevenstown Mine consist mainly of an irregular layer, 50 feet or more thick, of greenstone altered to tactite that forms the roof of a large diorite stock (Wright, 1915; Warner and others, 1961). The tactite and diorite are cut by several diorite, diorite porphyry, and dacite dikes. Most of the ore is confined to a nearly-flat, undulating layer near the surface; it is about 8 to 25 feet thick, 300 feet long, and 200 feet wide. The layer contains disseminated pyrite and chalcopyrite and scattered pockets of higher-grade chalcopyrite, magnetite, and pyrite that commonly are intergrown with coarse-grained hornblende and chlorite. There is relatively little magnetite in the mine but several bodies of magnetite with disseminated pyrite and chalcopyrite occur nearby.

The Stevenstown Mine consists of two large and two small glory holes and a 550-foot tunnel about 50 to 60 feet below the glory holes (Wright (1915; Warner, 1961; Roppel, 1991; Maas and others, 1995; Hedderly-Smith, 1999 [Inventory]). There is another adit nearby that did not encounter ore and there are numerous trenches and pits and a shallow shaft.

The mine was active from 1906 to 1908 and produced about 42,000 tons of ore with an average grade of 2.88 percent copper, 0.0308 ounce of gold per ton, and 0.264 ounce of silver per ton. In 1915 the property was acquired by the Granby Consolidated Mining Company and was mined until 1918.

Warner and others (1961) and Wright and Tolonen (1947) estimate that the Mount Andrew (CR071), Stevenstown, and Mamie (CR073) mines have a combined resource of 2,684,000 long tons of ore, but indicate that about 80 percent of that is at the Mount Andrew Mine and most of the rest is at the Mamie Mine. This material has an average grade of 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tononen, 1947).

The Stevenstown Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of tactite.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status: Active

Workings/exploration:

The Stevenstown Mine consists of two large and two small glory holes and a 550-foot tunnel about 50 to 60 feet below the glory holes. There is another adit nearby that did not encounter ore and there are numerous trenches and pits and a shallow shaft.

Production notes:

The Stevenstown Mine was active from 1906 to 1908 and produced about 42,000 tons of ore with an average grade of 2.88 percent copper, 0.0308 ounce of gold per ton, and 0.264 ounce of silver per ton. In 1915 the mine was acquired by the Granby Consolidated Mining Company, who operated it and the Mamie Mine until 1918.

Reserves:

Warner and others (1961) and Wright and Tolonen (1947) estimate that the Mount Andrew (CR071), Stevenstown, and Mamie (CR073) mines have a combined resource of 2,684,000 long tons of ore, but indicate that about 80 percent of that is at the Mount Andrew Mine and most of the rest is at the Mamie Mine. This material has an average grade of 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tononen, 1947).

Additional comments:

In 1998, Sealaska Corporation purchased the patented ground that covers the Mamie and Stevenstown mines and they hold the subsurface rights to the land around them.

References:

Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Buddington and Chapin, 1929; Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Bain, 1946; Wright and Tolonen, 1947; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Maas and others, 1992; Bond, 1993; Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Mamie

Site type: Mine

ARDF no.: CR073

Latitude: 55.5191 **Quadrangle:** CR C-1

Longitude: 132.2839

Location description and accuracy:
The location of the Mamie Mine is shown on the USGS 1:63,360-scale topographic map. It is near the southwest corner of section 24, T. 73 S., R. 86 E. The extensive surface and underground workings and the geology of the mine area are shown on plate 6 of Warner and others (1961).

Commodities:

Main: Cu, Fe

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet, hornblende

Geologic description:
The Mamie Mine is on the west flank of a syncline (Warner and others, 1961). The tactite and greenstone host rocks are complexly faulted and folded. The rocks are cut by numerous large, irregular masses and dikes of diorite, andesite, diorite porphyry, and dacite. The ore bodies are mainly in a contorted layer of magnetite 15 to 50 feet thick that is at least 500 feet long. Pyrite and chalcopyrite are disseminated through the magnetite and tactite. The ore bodies consisted of several irregular, copper-rich masses near the periphery of the magnetite bodies. The ore contained about 1.8 percent copper, 0.0204 ounce of gold per ton, and 0.126 ounce of silver per ton.

The Mamie Mine consists of 3 glory holes, 3 adits, a shaft, and many drifts and crosscuts. There are about 5,000 feet of workings to a depth of about 200 feet. Details of the geology and the workings are shown on plate 6 of Warner and others (1961).

The early history of the Mamie Mine is intimately tied to the 350-ton smelter at Hadley on the north side of Kasaan Peninsula (Wright, 1915; Warner and others, 1961; Roppel, 1991). The smelter, which operated intermittently from late 1905 to 1908, was built to process ore from the Mamie Mine that was delivered to it by an aerial tramway. In 1908, however, the smelter closed due to low copper prices and to the generally marginal economics of small copper smelters. In 1913, Granby Consolidated Mining Company acquired the Mamie and Stevenstown mines and shipped ore until 1918. There has been no production since. The Mamie Mine produced over $1,000,000 in copper ore from 1905 to 1918.

Warner and others (1961) and Wright and Tolonen (1947) estimate that the Mount Andrew (CR071), Stevenstown, and Mamie (CR073) mines have a combined resource of 2,684,000 long tons of ore, but indicate that about 80 percent of that is at the Mount Andrew Mine and most of the rest is at the Mamie Mine. This material has an average grade of 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tononen, 1947).

The Mamie Mine is one of many copper-iron deposits on the Kasaan Peninsula having similar geology and origin (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of tactite.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

The Mamie Mine consists of 3 glory holes, 3 adits, a shaft, and many drifts and crosscuts. There are about 5,000 feet of workings to a depth of about 200 feet. Details of the geology and the workings are shown on plate 6 of Warner and others (1961). The early history of the Mamie Mine is intimately tied to the 350-ton smelter at Hadley on the north side of the Kasaan Peninsula (Wright, 1915; Warner and others, 1961; Roppel, 1991). The smelter, which operated intermittently from late 1905 to 1908, was built to process ore from the Mamie Mine that was delivered to it by an aerial tramway. In 1908, however, the smelter closed due to low copper prices and to the generally marginal economics of small copper smelters. In 1913, Granby Consolidated Mining Company acquired the Mamie and Stevenstown mines and shipped ore until 1918. There has been no production since. The Mamie Mine produced over $1,000,000 in copper ore from 1905 to 1918.

Production notes:
The Mamie Mine produced over $1,000,000 in copper ore from 1905 to 1918.

Reserves:
Warner and others (1961) and Wright and Tolonen (1947) estimate that the Mount Andrew (CR071), Stevenstown, and Mamie (CR073) mines have a combined resource of 2,684,000 long tons of ore, but indicate that about 80 percent of that is at the Mount Andrew Mine and most of the rest is at the Mamie Mine. This material has an average grade of 47.8 percent iron, 0.32 percent copper, and 0.011 ounce of gold and 0.55 ounce of silver per ton (Wright and Tononen, 1947).

Additional comments:
In 1998, Sealaska Corporation purchased the patented ground that covers the Mamie and Stevenstown mines and they hold the subsurface rights to the land around them.

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Buddington and Chapin, 1929; Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Bain, 1946; Wright and Tolonen, 1947; Twenhofel, 1953; Carr and Dutton, 1959; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Maas and others, 1992; Bond, 1993; Anzman, 1995; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Kasaan); Hedderly-Smith, 1998 (Kasaan); Hedderly-Smith, 1999 (Kasaan); Hedderly-Smith, 1999 (Inventory).

Primary reference: Warner and others, 1961

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Pelaska; Hilma; Sunrise; Venus; Pennsylvania

Site type: Prospects

ARDF no.: CR074

Latitude: 55.5351 **Quadrangle:** CR C-1

Longitude: 132.3032

Location description and accuracy:

Prior to WW I, many claims were staked west of the head of Lyman Anchorage in what was then called 'Hole in the Wall' (Wright, 1915). There is little specific information about the location of most of these claims and prospects and this site is somewhat arbitrarily plotted about 0.3 mile west of the site of Hadley, in the SW1/4 section 14, T. 73 S., R. 86 E. This site is near the workings on the Hilma claim at an elevation of about 310 feet. The other prospects may be 0.5 mile or more away.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, magnetite, pyrite

Gangue minerals: Calcite, epidote, garnet

Geologic description:

Prior to WW I, many claims were staked near the contact between contact-metamorphosed limestone and diorite west of 'Hole in the Wall,' a constricted basin at the the head of Lyman Anchorage (Wright and Wright, 1908; and Wright 1915) At the Hilma claim, 1/2 mile northwest of the head of the bay at an elevation of 310 feet, a 25-foot tunnel at a limestone-diorite contact exposes small masses of garnet-epidote-calcite tactite with chalcopyrite. The Eureka claim, near tidewater at the head of the bay, has similar mineralization. At an elevation of about 1,050 feet on the Sunrise claims, a 25-foot-wide contact zone contains considerable chalcopyrite and magnetite; and at an elevation of about 950 feet, an open cut exposed coarsely crystalline marble and small amounts of tactite containing some chalcopyrite. On the Pennsylvania claims, an open cut at an elevation of about 850 feet follows a felsite dike and exposes a 2- to 3-foot-wide vein with pyrite and minor chalcopyrite. At the Pelaska claims, which extend west from the head of the bay, a 100-foot tunnel follows a belt of altered limestone cut by a diabase dike. Garnet-epidote rock with minor chalcopyrite occurs at the contact.

The small deposits at this site are similar in geology and origin to many copper-iron deposits on the Kasaan Peninsula (Warner and others, 1961; Eberlein and others, 1983; Brew, 1996). The rocks on the peninsula consist mainly of andesite ('greenstone' in much of the older literature) interbedded with about 25 percent sedimentary rocks comprising approximately equal amounts of limestone or marble, calcareous mudstone and sandstone, and graywacke and conglomerate. These units are part of the Luck Creek Breccia of Silurian and Devonian age, but many of the sedimentary units are similar to and probably grade into rocks of the Silurian and Ordovician, Descon Formation. The bedded rocks are intruded by a profusion of Silurian or Ordovician dikes, sills, and irregular masses of porphyritic gabbro, basalt, andesite, diorite, dacite, and granodiorite. Near some of the deposits, these intrusions may make up 20 percent or more of the outcrop and usually are associated with the development of tactite and alteration of the greenstone. The area subsequently was intruded by several large Silurian or Ordovician plutons; they are mainly granodiorite but locally are diorite and gabbro.

The ore deposits are typically small and of irregular shape; often the ore bodies form lenses or mantos. Some of the deposits conform to the layering in the greenstone and sedimentary rocks. The principal ore minerals are chalcopyrite, pyrite, and magnetite; hematite is often present and a little molybdenite occurs in some deposits. Most of the deposits are associated with tactite or skarn with varying amounts of actinolite, calcite, chlorite, garnet, diopside, epidote, and hornblende. There was significant by-product silver and gold in the ore that was mined in the past, and the gold values in some deposits are high enough to have encouraged exploration in recent years. Marble is more common in the deposits in the western part of the peninsula, where the gold values are generally higher as well (Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Myers, 1985; Bond, 1993; Maas and others, 1995).

Early interpretations of the ore deposits on the Kasaan Peninsula emphasize their contact metamorphic origin and their probable Mesozoic age (for example, Warner and others, 1961). However, recent radiometric dating and mapping indicate that the deposits formed in a Silurian or Ordovician, arc-related environment characterized by deposition of andesite and submarine sedimentary rocks that were intruded by swarms of dikes of varying composition, mineralized, and then intruded by large granodiorite plutons (Hedderly-Smith, 1999 [Inventory]).

The copper deposits of the Kasaan Peninsula were known to the Russians and the first claim was staked in 1867. Most of the production and development occurred from about 1900 to 1918, especially from 1905 to 1907, when copper prices soared and a smelter was built at Hadley on the north side of the Kasaan Peninsula. After World War I, copper supply exceeded demand, prices fell, and there has been no further copper production since 1918 (Wright, 1915; Warner and others, 1961; Roppel, 1991; Maas and others, 1995). However, because of the intense and widespread mineralization on the peninsula, the area has repeatedly been re-examined for copper, iron, and gold, notably during WW II (Warner and others, 1961) and in the last several decades.

Alteration:

Pervasive development of tactite in greenstone and marble.

Age of mineralization:

The deposit formed in a Silurian or Ordovician, submarine arc-related environment characterized by the deposition of volcanic and sedimentary rocks, the intrusion of swarms of dikes of diverse composition, and the emplacement of several large plutons.

Deposit model:

Cu-Fe skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Numerous claims were staked in the area prior to 1918, and two short adits and several trenches explored a number of occurrences of copper mineralization near the contact of limestone with diorite.

Production notes:

None, although Bufvers (1967) noted that 50 tons of material was mined at the Pelaska prospect and left on the dump.

Reserves:

None.

Additional comments:

References:

Wright and Paige, 1908; Wright and Wright, 1908; Wright, 1915; Warner and others, 1961; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Myers, 1985; Roppel, 1991; Bond, 1993; Maas and others, 1995;

Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Keystone

Site type: Prospect

ARDF no.: CR075

Latitude: 55.6133 **Quadrangle:** CR C-1

Longitude: 132.0159

Location description and accuracy:

The portal of the main adit of the Keystone prospect is on the north bank of Smugglers Creek, about 1.1 mile above its mouth. It is about 0.4 mile west of the center of section 24, T. 72 S., R. 87 E. The location is accurate.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:

The Keystone prospect consists of two sets of veins: one is parallel to the foliation of the country rocks and has sharp walls; the other set consists of gash veins that extend into the wallrock. The veins are auriferous and contain pyrite, which also is disseminated in the wall rock. The best ore is at the intersection of the two sets of veins. The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

According to Brooks (1902) and Wright and Wright (1908), the workings on the Keystone prospect consist of a shaft 120 feet deep with drifts and crosscuts from it, and a tunnel with about 700 feet of crosscuts and drifts. Apparently, no workings have been driven since before 1908 and there is no record of production The tunnel intersects a sheared and brecciated zone 20 to 40 feet wide in greenstone and greenschist. The zone has many irregular quartz veins and lenses an inch to several feet wide; pyrite impregnates much of the rock in the zone. Samples of ore contained $3.20 to $20.00 per ton in gold (at $20.67 per ounce), and averaged about $8 per ton. 28 samples along the workings collected by Munoz (1977) averaged 0.099 ounce of gold per ton. Samples across 5-foot widths varied from 0.01 to 0.44 ounce of gold per ton. Soil geochemistry and and self-potential geophysics have indicated that they are effective in defining the mineralized zone (Maas and others, 1995).

Alteration:

Not specifically mentioned; the brecciated and sheared zone that hosts the auriferous quartz veins is impregnated with pyrite.

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The workings, all of which date from before WW I, consist of a 120-foot shaft with drifts and crosscuts from it, and a tunnel with drifts and crosscuts that total about 700 feet.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Bufvers, 1967; Munoz, 1977; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Brooks, 1902; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Novatney

Site type: Prospect

ARDF no.: CR076

Latitude: 55.6212 **Quadrangle:** CR C-1

Longitude: 132.0073

Location description and accuracy:
The Novatney prospect is about 1.5 miles north of the mouth of Smugglers Creek and about 0.3 mile east of hill 1761. It is about 0.4 mile south-southwest of the center of section 13, T. 72 S., R. 87 E. The location is accurate.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
As described by Townsend (1952) and Williams (1952), the Novatney prospect consists of small cut about 100 feet long that exposes a mineralized shear zone in greenstone and greenschist. The shear zone is up to 10 feet wide, contains lenses of quartz, strikes northeast, and dips 72SE. Fine-grained pyrite occurs both in the quartz and in schist in the shear zone. In one location, the shear zone which is about 4.5 feet thick, contains pyrite-bearing quartz. Six channel samples 6 to 42 feet long across the mineralized structure contained a trace to 0.04 ounce of gold per ton. The best sample was about 60 percent quartz that contained 0.06 ounce of gold per ton and no silver. Recent sampling produced values up to 2,830 parts per billion gold and up to 4.1 parts per million silver (Bittenbender and others, 1993; Maas and others, 1995) The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:
Not specifically mentioned; the brecciated and sheared zone that hosts the auriferous quartz veins is impregnated with pyrite.

Age of mineralization:
The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only working is an open cut about 100 feet long.

Production notes:

Reserves:

Additional comments:

References:
Townsend, 1952; Williams, 1952; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Bittenbender and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hoffman; Alexander; Melville

Site type: Mine

ARDF no.: CR077

Latitude: 55.6295 **Quadrangle:** CR C-1

Longitude: 132.0248

Location description and accuracy:
This site is about at the center of three old prospects with similar geology--the Alexander, Hoffman, and Melville--in an area of about one-quarter square mile. The site is about 2.2 miles north-northwest of the mouth of Smugglers Creek, near the center of the NE1/4 section 14, T. 72 S., R. 87 E.

Commodities:

Main: Au

Other:

Ore minerals: Arsenopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
This site consist of a group of three neighboring prospects--Alexander, Hoffman, and Melville--that date from before WW I and have similar geology (Wright and Wright, 1908). At the Alexander prospect, a 45-foot tunnel exposes a quartz vein 6 inches to 3 feet wide that strikes north and dips 45W; it intersects the schistosity of folded greenstone and slate. At the Hoffman prospect, an irregular quartz vein about 5 feet thick strikes N5W and dips steeply west. It is exposed in a 21-foot tunnel in faulted greenstone and schist. Minor pyrite occurs in the quartz vein and in the wallrock. At the Melville prospect, a quartz vein cuts folded and faulted slate and greenstone. A little ore was mined from a short tunnel and treated in an arrastre. The deposit at the Melville prospect is unusual in the Helm Bay district because it contains arsenopyrite rather than pyrite in the quartz vein and wallrock. There is no indication of any exploration on any of these prospects since before WW I. The best of several recent samples of these prospects contained 2,642 parts per billion gold across 5 inches of mineralization (Bittenbender and others, 1993; Maas and others, 1995). The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:
The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status:

Workings/exploration:

Each of these three prospects was explored by short adits, the longest 45 feet long, that were driven prior to 1908.

Production notes:

No production from the Alexander and Hofman prospects; the Melville produced a small amount of ore prior to 1908 that was treated in a local arrastre.

Reserves:

None.

Additional comments:

References:

Wright and Wright, 1906; Wright and Wright, 1908; Cobb, 1978; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908; Bittenbender and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Puzzler

Site type: Prospect

ARDF no.: CR078

Latitude: 55.6417 **Quadrangle:** CR C-1

Longitude: 132.0320

Location description and accuracy:
The Puzzler prospect is at an elevation of about 500 feet, about 0.3 mile south of the center of an unnamed lake in the upper half of section 11, T. 72 S., R. 87 E. The location is accurate.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
As described by Wright and Wright (1908), the Puzzler prospect was explored by a 180-foot tunnel in greenstone and greenschist. At 60 feet, the tunnel intersected a quartz vein. The vein is parallel to the foliation of the host rocks, which strike N50E and dip 60 SE. The deposit reportedly has two sets of veins similar to those at the Gold Standard Mine (CR081). One set is parallel to the foliation of the host rocks and the other is oblique to the foliation. Slip planes parallel to the foliation and faults are common. There has probably been no work at the prospect since before 1908 and there is no record of production. The highest value in several samples taken during a recent study of the the district contained 51 parts per billion gold across 5 feet (Bittenbender and others, 1993; Maas and others, 1995). The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:
The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
A 180-foot tunnel and several trenches and prospect pits.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Cobb, 1978; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908; Bittenbender and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lone Jack

Site type: Prospect

ARDF no.: CR079

Latitude: 55.6440 **Quadrangle:** CR C-1

Longitude: 132.0048

Location description and accuracy:

The only description of the Lone Jack prospect is by Roehm (1936 [MR 191-3]). He indicates that the workings are southwest of the lower workings of the Gold Standard Mine (ARDF site KC028 in the Ketchikan quadrangle), about 2,100 feet from the shoreline, and between about 850 and 1,200 feet in elevation. This would place the prospect near the middle of the N1/2 section 12, T. 72 S. R. 87 E. The location probably is accurate.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:

As described by Roehm (1936 [MR 191-3]), two tunnels were driven on a mineralized structure that is exposed for about 600 feet, between 850 and 1,200 feet elevation. Quartz lenses occur along the structure, which has highly sheared walls. The hanging wall of the structure is greenschist; the footwall is greenstone. The quartz is mixed with numerous pieces of wall rock, and contains pyrite, calcite, and chlorite. The lower tunnel is 60 feet long and has a 10-foot crosscut. A small lens of quartz is exposed for half the length of the tunnel; the first 20 feet was reported to average about 0.25 ounce of gold per ton. The lens strikes N15E and dips 63E. The upper tunnel is 30 feet long and has an 8-foot crosscut. A flat-lying, 4-inch quartz vein is exposed that cuts other small quartz veins. The flat vein was reported to have good gold values; the other small veins were reported to average about 0.25 ounce of gold per ton. The wall rock of the veins is also mineralized. Apparently, there has been no other work on the property. The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The prospect was explored by two tunnels, one 60 feet long and the other 30 feet long.

Production notes:

Reserves:

Additional comments:

References:
Roehm, 1936 (MR 191-3); Eberlein and others, 1983; Gehrels and Berg, 1992; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1936 (MR 119-03)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Midnight Sun

Site type: Prospect

ARDF no.: CR080

Latitude: 55.6558 **Quadrangle:** CR C-1

Longitude: 132.0184

Location description and accuracy:

In their text, Wright and Wright (1908) locate this prospect at an elevation of about 560 feet, about one-half mile west of the upper workings of the Gold Standard Mine (CR081). However, their small-scale, somewhat generalized map shows it about one-half mile northwest of the upper workings of the Gold Standard Mine; this would would place it at a considerable higher elevation of about 1,000 feet or more. For this record, the site follows their map and places the prospect about 0.5 mile east of the center of section 2, T. 72 S., R. 87 E. The location is probably accurate to within 0.5 mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold, pyrite

Gangue minerals: Quartz

Geologic description:

The only working at the Midnight Sun prospect is a 15-foot open cut (Wright and Wright, 1908). A quartz vein 6 inches to 2 feet thick, that strikes N80W and dips 30N, cuts greenstone and greenschist. The vein and host rocks are cut by numerous faults that offset the vein. The vein includes fragments of wall rock, and minor pyrite and free gold. Apparently there has been no work on the prospect since 1908. The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The only working is a 15-foot open cut.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Cobb, 1978; Eberlein and others, 1983; Gehrels and Berg, 1992; Clautice and others, 1994; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gold Standard; Blue Jay; Lakeview

Site type: Mine

ARDF no.: CR081

Latitude: 55.6514 **Quadrangle:** CR C-1

Longitude: 132.0041

Location description and accuracy:
This record describes only the upper workings of the Gold Standard Mine. They are centered about 0.4 mile south of the 'Bert Lide Mine' shown on the USGS 1:63,360-scale topographic map, and about 0.3 mile south of the center of section 1, T. 72 S., R. 87 E. The location is accurate. (The glory holes at the lower workings of the Gold Standard Mine are in the Ketchikan (C-6) quadrangle and are described in ARDF record KC028.)

Commodities:

Main: Ag, Au

Other:

Ore minerals: Galena, gold, pyrite, tetradymite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:
The Gold Standard Mine was discovered in 1898 and the upper workings, which are described in this record, were mined until 1914. The production from those workings is obscure but probably significant. About $20,000 in gold (at $20.67 per ounce) was said to have been produced just from a surface pocket prior to 1902 (Brooks, 1902). In 1914, operations at this mine shifted to glory holes near the shoreline to the east . Those lower workings are in the Ketchikan quadrangle and are described in ARDF record KC028.
According to Brooks (1902) and Wright and Wright (1908), the upper workings consisted of a 150-foot shaft on the principal vein, and two tunnels with about 1,000 feet of workings on two levels. The ore was processed at a mill on the property. The deposit consists of two sets of quartz veins in metamorphosed greenstone and greenschist. One set, typified by the principal vein, is parallel to the schistosity of the host rocks. It strikes about N25W and dips 60E and varies from 6 inches to 6 feet thick. The other set consists of gash veins that extend from the main vein; they also strike about N25W but dip 60-75 SW. The veins are faulted and there is considerable gouge along the footwalls. The veins are mainly quartz with subordinate chlorite and calcite. Free gold occurs in the veins with minor pyrite and galena; the telluride tetradymite is reported from the gash veins. The ore is free milling and was said to run about $5 to $15 per ton in gold (at $20.67 per ounce). Bittenbender and others (1993) and Maas and others (1995) sampled the workings. The average gold content of samples taken along 40 meters of vein that averages 0.73 meter thick, was 3,713 parts per billion (ppb). A sample across 0.43 meters of the 'Folwarzny vein' contained 5,500 ppb gold.
The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.
This site also includes the Lakeview prospect described by Maas and others (1995), which is about 0.1 mile west of the main workings of the upper Gold Standard Mine. The deposit is probably similar to the one at the Gold Standard. The average gold content of samples taken over a length of 550 feet of a vein that averages about 20 inches wide was 3,103 ppb. The only workings are trenches and prospect pits.

Alteration:

Age of mineralization:
The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
The deposit was discovered in 1898 and the mine was productive until 1914, when operations shifted to glory holes to the east in the Ketchikan quadrangle (ARDF KC028). The workings consist of a 150-foot shaft on the principal vein, and two tunnels with about 1,000 feet of workings on two levels; there was a mill on the property.

Production notes:
The production from the upper workings of the Gold Standard Mine is obscure but probably substantial. About $20,000 in gold (at $20.67 per ounce) was said to have been produced just from a surface pocket prior to 1902 (Brooks, 1902). There was also considerable production from 1915 to 1940 from several glory holes near the shoreline to the east in the Ketchikan quadrangle. That production is described in ARDF record KC028.

Reserves:
None

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Smith, 1914; Brooks, 1915; Chapin, 1916; Brooks, 1922; Roehm, 1938 (PE 120-6); Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908; Bittenbender and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Freegold

Site type: Prospect

ARDF no.: CR082

Latitude: 55.6566 **Quadrangle:** CR C-1

Longitude: 132.0046

Location description and accuracy:

The Freegold prospect is the name used most frequently for what is labeled the 'Bert Lide Mine' on the USGS 1;63,360-scale topographic map. (The correct spelling is Bert Libe, who was involved with many of the properties in the area, including this one.) The prospect is about 0.1 mile north of the center of section 1, T. 72 S., R. 87 E. The location is accurate.

Commodities:

Main: Ag, Au

Other:

Ore minerals: Chalcopyrite, gold, pyrite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:

The Freegold prospect was discovered in 1903 and in early reports was included with the Gold Standard Group (Wright and Wright, 1908). According to Roehm (1938 [PE 120-5]), it emerged as a separate prospect in about 1932. Shortly thereafter the Freegold tunnel was started and reached a length of 1,470 feet. Several of the veins on the property have been traced on the surface in numerous pits and trenches.

The mineralization is in shear zones that contain lenses, stringers, and pods of quartz. The host rocks are folded and faulted greenstone and greenschist. The two major mineralized structures are the Rodgers and the Bugge veins. In addition to the Freegold tunnel, there are two short adits on the property, and several smaller quartz veins are exposed in surface pits. Pyrite, and minor chalcopyrite and free gold occur both in the quartz veins and in the adjacent schist and greenstone. The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

The Rodgers vein was exposed in open cuts for 800 feet. The vein is 6 inches to 3 feet thick and lenticular. Small quartz veins project from the main vein and their intersections with it are notably rich. Fine needles of tourmaline occur in the quartz. Roehm (1938 [PE 120-5]) channel sampled the Rodgers vein for 150 feet on the surface; the samples contained about $14 per ton in gold (at $35 per ounce?).

The Freegold tunnel was driven to intersect the Bugge vein, but about 250 feet from the portal, the tunnel crossed another mineralized shear zone with quartz lenses. Roehm's cross-section indicates that it is about 30 feet thick. His channel samples across 7 feet of this zone contained about $14 per ton in gold (at $35 per ounce?). Bittenbender and others (1993) and Maas and others (1995) sampled in the Freegold tunnel. The weighted average of their samples along 65 feet of mineralization in the tunnel is 2,056 parts per billion gold. A select sample across 30 inches contained 17.31 parts per million (ppm) gold and 7.7 ppm silver.

Alteration:

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings consist of a 1,470-foot tunnel, two short adits, and numerous trenches and open pits.

Production notes:
Apparently none.

Reserves:
None.

Additional comments:

References:
Wright and Wright, 1908; Roehm, 1936 (MR 191-3); Roehm, 1938 (PE 120-5); Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1938 (PE 120-5); Bittenbender and others, 1993

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Portland; Helm Bay King

Site type: Mine

ARDF no.: CR083

Latitude: 55.6633 **Quadrangle:** CR C-1

Longitude: 132.0202

Location description and accuracy:

This property, which is commonly known as the Portland Mine, is near the adit symbol on the USGS 1:63,360-scale topographic map just to the east of name 'Sleeping Beauty Mine.' (The adit is not the Sleeping Beauty Mine, which is ARDF site CR084, about 0.3 mile to the northwest.) The Portland Mine is near the southeast corner of section 35, T. 71 S., R. 87 E. The location is accurate.

Commodities:

Main: Ag, Au

Other: Cu

Ore minerals: Gold, pyrite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:

The Portland Mine was probably discovered prior to 1921, but the first published description of it is in Buddington (1925). He described the deposit as two sets of veins along shear zones in greenstone and greenschist. One set of veins is parallel to the foliation; the other set consists of gash veins oblique to the foliation. The veins consist mainly of milky white quartz with minor calcite and chlorite. In 1923, the workings consisted of a 45-foot shaft, a tunnel, and trenches. The ore zone at the bottom of the shaft was reported to contain about $14 per ton in gold (at $20.67 per ounce). Roehm (1938 [PE 119-13]) reports a mill on the property which processed a few tons of ore. He described the deposit as numerous quartz stringers up to 2 feet thick in highly folded greenstone and greenschist. Townsend (1941) visited the property when the workings consisted of a 320-foot tunnel and about 100 feet of drift along the mineralized zone. He noted some barren quartz veins, but the gold values were chiefly associated with bands of fine pyrite in greenschist. The weighted average of 11 samples collected by Townsend along 100 feet of the mineralized zone that averaged about 4.2 feet wide was 0.07 ounce of gold per ton. A mill had been in operation only a few weeks at the time of his visit. Bittenbender and others (1993) and Maas and others (1995) mapped and sampled the underground workings. They indicate that the best mineralization is along an ore shoot that plunges northwest at about 25 degrees and is localized by a deflection in the fault along the vein. The weighted average of their samples along about 270 feet of mineralization that averaged about 5 feet thick was 5,962 parts per billion gold. Maas and others (1995) indicate that mine produced 64 ounces of gold and 38 ounces of silver.

The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
As last described in 1941 when the mine was still active, the workings consisted of a 45-foot shaft, a 320 foot tunnel, and about 100 feet of drift along the mineralized zone.

Production notes:
The mine was active intermittently from 1921 or earlier to at least 1941 and probably produced small amounts of gold in some years. Maas and others (1995) indicate that the mine produced 64 ounces of gold and 38 ounces of silver.

Reserves:
None.

Additional comments:

References:
Brooks, 1925; Buddington, 1925; Roehm, 1938 (PE 119-13); Townsend, 1941; Cobb, 1978; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Townsend, 1941

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Sleeping Beauty; Beat; Stensland

Site type: Prospect

ARDF no.: CR084

Latitude: 55.6668 **Quadrangle:** CR C-1

Longitude: 132.0287

Location description and accuracy:
The adit symbol for the Sleeping Beauty prospect on the USGS topographic map is incorrectly located. The actual location of the workings are at an elevation of about 400 feet, about 0.4 mile west-northwest of the adit symbol shown on the USGS map, and about 0.2 mile south of the center of section 35, T. 71 S., R. 87 E. The location is accurate.

Commodities:

Main: Ag, Au

Other: Cu

Ore minerals: Chalcopyrite, gold, pyrite

Gangue minerals: Calcite, chlorite, quartz

Geologic description:
As described by Roehm (1936 [MR 191-3] and 1938 [PE 119-12]), the Sleeping Beauty prospect consists of 6 claims, a 35-foot adit with a short crosscut along the mineralization, and several trenches and pits. The deposit is in greenschist and greenstone and consists of quartz and gouge along a fault that strikes N30W and dips 74SW. Numerous quartz stringers dip into the fault from its footwall. The mineralized zone can be traced for about 300 feet. A sample 20 feet long along the mineralization in the crosscut averaged $11.00 per ton in gold (at $20.67 per ounce). The ore minerals are free gold, pyrite, and minor chalcopyrite in a gangue of quartz, calcite, chlorite, and gouge. There was some work as late as 1936 but there is no record of production. Several chip samples collected by Bittenbender and others (1993) and Maas and others (1995) contained 2,255 to 7,737 parts per billion gold; one sample across 2.0 feet of vein contained 13.61 parts per million gold.
The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:
The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The workings consist of a 35-foot adit with a short crosscut along the vein structure, and several trenches and pits.

Production notes:

Apparently none.

Reserves:

None.

Additional comments:

References:

Roehm, 1936 (MR 191-3); Roehm, 1938 (PE 119-12); Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Clautice and others, 1994; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1936 (MR 191-3)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gold Belt North; Wixon; Peterson-Arwick-Wixon Group

Site type: Prospects

ARDF no.: CR085

Latitude: 55.6811 **Quadrangle:** CR C-1

Longitude: 132.1182

Location description and accuracy:

This prospect, which has been known under several names, is west of the center of Bear Lake and extends from an elevation of about 1,300 to 1,900 feet. The center of the workings is about 0.4 mile southwest of the center of section 29, T. 71 S., R. 87 E. The location is accurate.

Commodities:

Main: Ag, Au

Other: Cu, Pb, Zn

Ore minerals: Chalcopyrite, galena, gold, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

Roehm (1936 [PE 119-1]) reported that this prospect was discovered in 1931 and was covered by a group of 8 lode claims and 1 placer claim west of Bear Lake. The deposit is in greenschist and slate and consists of three, parallel zones of quartz stringers, at elevations of 1280, 1460, and 1900 feet. The zones are 30 to 200 feet thick; the stringers are an inch to a foot thick. There are no assay data, but free gold was reported to have been panned from the veins and a small mill was built near Bear Lake. Munoz (1977) indicates that the property was examined by Cominco Exploration and restaked as the Gold Belt Group in 1975(?), but apparently there has been little work since. The mill was in ruins in 1977. Several samples were collected by Bittenbender and others (1993). Their representative samples from 13 quartz veinlets averaged 267 parts per billion (ppb) gold and 0.9 part per million (ppm) silver. A sample from a quartz vein with up to 5 percent galena, sphalerite, chalcopyrite, and pyrite contained 4,698 ppb gold, 2.4 ppm silver, and 719 ppm lead.

The rocks in the area consist of metamorphosed andesite, basalt, agglomerate, and tuff, and minor flysch, shale, and phyllite. Eberlein and others (1983) and Brew (1996) consider them to be Paleozoic or Mesozoic in age; Gehrels and Berg (1992) tentatively mapped them as Jurassic or Cretaceous.

Alteration:

Age of mineralization:

The quartz veins cut country rocks that may be as young as Cretaceous or as old as Paleozoic.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: Undetermined.

Site Status: Undetermined

Workings/exploration:
Claims were staked in 1931 and at least some surface exploration is implied. A small mill was built on Bear Lake. The property was restaked in 1975(?) but apparently there has been little work since.

Production notes:
None is recorded but it is possible that the mill produced a small amount of gold.

Reserves:
None.

Additional comments:

References:
Roehm, 1936 (PE 119-1); Munoz, 1977; Eberlein and others, 1983; Gehrels and Berg, 1992; Bittenbender and others, 1993; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1936 (PE 119-1)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Cape Addington)

Site type: Occurrence

ARDF no.: CR086

Latitude: 55.4507 **Quadrangle:** CR B-6

Longitude: 133.8109

Location description and accuracy:
This occurrence is in a cliff face about 1.0 mile north-northeast of Cape Addington at the north end of a rocky beach. It is about 0.2 mile south of the center of section 14, T. 74 S., R. 76 E.

Commodities:

Main: Ag, Cu, Zn

Other: Pb

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Epidote, garnet, quartz

Geologic description:
This occurrence is at the contact between Silurian Heceta Limestone and a Cretaceous quartz monzonite and granodiorite pluton (Clark, 1970 [OF 420]; D.J. Grybeck, unpublished field notes and analyses, 1984). The pluton extends south to Cape Addington. Patches of calc-silicate gneiss and hornfels less than a few tens of feet thick mark the contact; locally there is quartz veining. The contact is also copper stained in places and there are disseminated and scattered small masses of sulfides, including chalcopyrite, sphalerite, galena, and pyrite. Almost all of the sulfides are within 10 feet of the contact and the mineralization is sparse. Selected samples contain up to several percent copper and zinc, and up to 50 parts per million silver.

Alteration:
Sparse skarn minerals at contact of granitic pluton and marble.

Age of mineralization:
In the contact of a Cretaceous granitic pluton.

Deposit model:
Contact-metamorphic Ag-Cu-Zn deposit.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:
Only limited surface sampling during geologic mapping.

Production notes:

Reserves:

Additional comments:

References:

Clark and others, 1970 (OF 420).

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Point Santa Theresa)

Site type: Occurrence

ARDF no.: CR087

Latitude: 55.4532 **Quadrangle:** CR B-5

Longitude: 133.6424

Location description and accuracy:
This occurrence is near Point Santa Theresa at about the center of section 13, T. 74 S., R. 77 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals: Quartz

Geologic description:
This occurrence is a quartz-chalcopyrite pod in argillite of the Descon Formation of Silurian and Ordovician age (Clark and others, 1970 [OF 419]).

Alteration:

Age of mineralization:
Probably younger than the host rock, which is argillite of Silurian or Ordovician age.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:
Only surface sampling during geologic mapping.

Production notes:

Reserves:

Additional comments:

References:
Clark and others, 1970 (OF 419); Cobb, 1978.

Primary reference: Clark and others, 1970 (OF 419)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (at northeast end of St. Ignace Island)

Site type: Occurrence

ARDF no.: CR088

Latitude: 55.4210 **Quadrangle:** CR B-5

Longitude: 133.4153

Location description and accuracy:
The location of this occurrence is not known other than that it is on the northeast end of St. Ignace Island, probably somewhere in section 28, T. 74 S., R. 79 E.

Commodities:

Main: Ba

Other:

Ore minerals: Barite

Gangue minerals:

Geologic description:
This occurrence consists of a barite vein less than 2 feet thick in Silurian or Ordovician basalt or andesite of the Descon Formation (Buddington, 1925; Buddington and Chapin, 1929; Eberlein and others, 1983; Brew, 1996). Maas and others (1991) could not locate this occurrence.

Alteration:

Age of mineralization:

Deposit model:
Barite vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status: Inactive

Workings/exploration:
Probably none.

Production notes:

Reserves:

Additional comments:

References:
Buddington, 1925; Buddington and Chapin, 1929; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Buddington and Chapin, 1929

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Veta Bay)

Site type: Occurrence

ARDF no.: CR089

Latitude: 55.3364 **Quadrangle:** CR B-5

Longitude: 133.6456

Location description and accuracy:
This occurrence is on the west coast of Baker Island, about 0.2 mile northwest of Dalton Hot Springs. It is west of the center of section 25, T. 75 S., R. 77 E. The location is accurate.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, marcasite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:
A quartz vein in granodiorite can be traced for about 200 feet along the shoreline (Maas and others, 1991, 1995). The vein contains chalcopyrite, marcasite, pyrite, and pyrrhotite. A 0.5 foot sample contained 1,294 parts per billion gold and 11.23 ounces of silver per ton (Maas and others, 1991, 1995). The vein is at or near the contact between a Cretaceous granitic pluton and Silurian Heceta Limestone (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Probably related to the emplacment of the Cretaceous granitic host rock.

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only sampling by government geologists.

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near south end of Port San Antonio)

Site type: Prospect

ARDF no.: CR090

Latitude: 55.3336 **Quadrangle:** CR B-5

Longitude: 133.6095

Location description and accuracy:
This prospect is a vein that extends from near the head of the south arm of Port San Antonio about 4,000 feet south-southeast toward Mount Miramar. The coordinates are at the north end of the vein in about the center of the SE1/4 section 30, T. 75 S., R. 78 E.

Commodities:

Main: Ag, Au

Other: Cu, Pb, Zn

Ore minerals: Bornite, chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
A quartz vein crops out on the beach at the southeast end of the south arm of Port San Antonio (Roehm (1936 [PE 119-3]). It can be traced S65E for about 4,000 feet and averages about 2 to 3 feet thick. The veins cuts both the Cretaceous granite south of Port San Antonio and the Silurian or Ordovician argillite and graywacke of the Descon Formation peripheral to the granite (Eberlein and others, 1983; Brew, 1996). The most intense mineralization is 200 to 300 feet from the granite contact. The vein contains pyrite, sphalerite, and galena, with minor chalcopyrite and bornite. Several channel samples contained a trace of gold and up to 2 ounces of silver per ton. In 1916, the prospector who discovered the vein said that it averaged about $3 per ton in gold (at $20.67 per ounce?) and 4 ounces of silver per ton over a distance of 3,000 feet. The vein has been prospected by several trenches and open cuts. This may be the prospect described by Wright and Wright (1908) as quartz veinlets with galena, sphalerite, and pyrite that cut argillite, but they locate it on the north side of Port San Antonio.

Alteration:

Age of mineralization:
The vein cuts a Cretaceous pluton.

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
The vein has been prospected by several trenches and open cuts.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Roehm, 1936 (PE 119-3); Twenhofel and others, 1946; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Roehm, 1936 (PE 119-3)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Mount Miramar)

Site type: Prospect

ARDF no.: CR091

Latitude: 55.3209 **Quadrangle:** CR B-5

Longitude: 133.5883

Location description and accuracy:

The location of this prospect is from an old, small-scale map that lacks topographic contours. For this record, the prospect is about 0.5 mile east of Mount Miramar near the center of section 32, T. 75 S., R. 78 E. The location is probably accurate to within 0.5 mile.

Commodities:

Main: Ag, Cu, Pb, Zn

Other:

Ore minerals: Galena, pyrite, sphalerite, tetrahedrite

Gangue minerals: Quartz?

Geologic description:

A silver-lead-zinc(-quartz?) vein in Silurian or Ordovician slate and argillite of the Descon Formation is exposed for nearly 300 feet along the south bank of a small creek and in old opencuts (Roehm, 1936 [PE 119-3]). The vein averages 18 to 24 inches thick and contains irregular masses of intergrown sphalerite and galena, with small amounts of pyrite and tetrahedrite. A sample across 22 inches of the vein contained a trace of gold, 9.20 ounces of silver per ton, 0.3 percent copper, 6.4 percent lead, and 15.3 percent zinc. A large Cretaceous granitic pluton crops out less than a mile to the south (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

May be related to the large Cretaceous granitic pluton to the south.

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status: None

Site Status: Undetermined

Workings/exploration:

A few open cuts.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Roehm, 1936 (PE 119-3); Twenhofel and others, 1946; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Roehm, 1936 (PE 119-3)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of mouth of Port San Antonio)

Site type: Prospect

ARDF no.: CR092

Latitude: 55.3250 **Quadrangle:** CR B-5

Longitude: 133.5744

Location description and accuracy:
This well known propect is along the shoreline about 0.2 mile northwest of triangulation station 'San Antonio.' It is about 0.9 mile north-northeast of Thimble Cove and about 0.4 mile south-southeast of the northwest corner of section 33, T. 75 S., R. 78 E.

Commodities:

Main: Au, Mo

Other: As

Ore minerals: Arsenopyrite, molybdenite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:
This deposit is exposed for about 600 feet just above the shoreline (Roehm, 1936 [PE 119-3]; Smith, 1942 [B 926-C]; Twenhofel and others, 1946). Silurian or Ordovician argillite and quartzite of the Descon Formation are intruded by a Cretaceous granodiorite pluton (Eberlein and others, 1983; Brew, 1996). The contact is marked by several hundred, generally parallel, quartz veins and veinlets 1 to 3 inches thick in the granodiorite. Molybdenite, arsenopyrite, pyrite, and pyrrhotite occur in the veins, along vein selvages, and along fractures in the granodiorite. The granite is silicified.
The property was originally staked from 1927 to 1930 and four holes were drilled in 1932 (Roehm, 1936 [PE 119-3]). Smith (1942 [B 926-C]), citing an unpublished report on the 1932 drilling, estimated that the deposit contains about 100,000 tons of mineralized rock that averages 0.276 percent molybdenum. The property was drilled again in 1943, and Twenhofel and others (1946) estimated that the deposit contains less than 0.05 percent molybdenum. Several descriptions of the deposit mention high gold values and Roehm (1936 [PE 119-3]) states that core samples from the holes drilled in 1932 contained an average of $3.20 in gold per ton (at $20.67 per ounce?).

Alteration:
Granodiorite host rock is silicified.

Age of mineralization:
Deposit is probably related to emplacement of the granodiorite host rock.

Deposit model:
Gold and molybdenum in quartz veinlets in the periphery of a granodiorite pluton.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

The deposit is well exposed just above the shoreline and 4 holes were diamond drilled in 1932. There was additional diamond drilling in 1943.

Production notes:

Reserves:

Smith (1942 [B 926-C]), citing an unpublished report on the 1932 drilling, estimated that the deposit contains about 100,000 tons of mineralized rock that averages 0.276 percent molybdenum. The property was drilled again in 1943, and Twenhofel and others (1946) estimated that the deposit contains less than 0.05 percent molybdenum. Several descriptions of the deposit mention high gold values, and Roehm (1936 [PE 119-3]) states that core samples from the holes drilled in 1932 contained an average of $3.20 in gold per ton (at $20.67 per ounce?).

Additional comments:

References:

Smith, 1933 (B 836); Smith, 1933 (B 844-A); Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Roehm, 1936 (PE 119-3); Smith, 1936; Smith, 1942 (B 926-C); Twenhofel and others, 1946; Wedow and others, 1953; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Roehm, 1936 (PE 119-3); Twenhofel and others, 1946

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near southern tip Baker Island)

Site type: Occurrence

ARDF no.: CR093

Latitude: 55.2700 **Quadrangle:** CR B-5

Longitude: 133.6431

Location description and accuracy:
This occurrence is at the head of an unnamed bay about 0.5 mile north-northwest of hill 1160. It is in about the center of the NW1/4 section 24, T. 76 S., R. 77 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:
This occurrence consists of pyrite and minor chalcopyrite in Silurian or Ordovician phyllite of the Descon Formation (Clark and others, 1970 [OF 419]; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:
Clark and others, 1970 (OF 419); Cobb, 1978; Brew, 1996.

Primary reference: Clark and others, 1970 (OF 419)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on San Juan Bautista Island)

Site type: Prospect

ARDF no.: CR094

Latitude: 55.4098 **Quadrangle:** CR B-4

Longitude: 133.2989

Location description and accuracy:

This site is at an elevation of about 950 feet where several holes were diamond drilled in the early 1970's. The location is near the middle of the west boundary of section 32, T. 74 S., R. 80 E. There are several other occurrences in the vicinity; all are probably less than 0.3 mile from the drill site.

Commodities:

Main: Cu, Mo?

Other: Ag, Au, Zn

Ore minerals: Chalcopyrite, pyrite, pyrrhotite, sphalerite

Gangue minerals: Quartz

Geologic description:

This prospect is associated with a small Cretaceous granitic pluton at the center of San Juan Bautista Island (Eberlein and others, 1983; Brew, 1996). The pluton intrudes Devonian graywacke, mudstone, and siltstone of the Port Refugio Formation, which crops out along the entire coastline of the island.

Clark and others (1970 [OF 418]) describe several types of deposits, most of which are probably at or near the contact between the pluton and the sedimentary rocks. The deposits include tactite with pyrite, pyrrhotite, and chalcopyrite; diorite with disseminated pyrite and chalcopyrite; and hornfels(?) cut by a quartz veinlet with pyrite and sphalerite.

There was considerable diamond drilling at an elevation of about 950 feet near a steep gully (D.J. Grybeck, unpublished field notes,1984). There are 3 or more sites where AlVenCo Inc. drilled in the early 1970's. The rock near the drill sites consists of hornblende-biotite monzonite or granodiorite. The granitic rock contains considerable disseminated pyrite and pyrite along fractures; it is also silicified and argillized. Six grab samples of outcrop and float of the richest mineralized rock contained 300 parts per million (ppm) to 2 percent copper; one contained 100 ppm silver and 150 ppm molybdenum; and one contained 0.75 ppm gold. The deposit was probably drilled as a copper or molybdenum porphyry deposit.

Alteration:

Silicification and argillization of granitic rock.

Age of mineralization:

Probably related to the emplacement of a Cretaceous granitic stock.

Deposit model:

Porphyry copper or molybdenum deposit?

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

There was considerable diamond drilling at an elevation of about 950 feet near a steep gully (D.J. Grybeck, unpublished field notes, 1984). There are 3 or more sites where Alvenco Exploration, Inc. drilled in the early 1970's.

Production notes:

Reserves:

Additional comments:

The subsurface rights to the land in the vicinity of this prospect are held by the Sealaska Corporation.

References:

Clark and others, 1970 (OF 418); Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on San Juan Bautista Island)

Site type: Occurrence

ARDF no.: CR095

Latitude: 55.4213 **Quadrangle:** CR B-4

Longitude: 133.2556

Location description and accuracy:
This occurrence is at an elevation of about 1,100 feet about 1.1 mile east-northeast of Bautista Peak. It is about 0.3 mile southeast of the center of section 28, T. 74 S., R. 80 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:
This prospect is associated with a small Cretaceous granitic stock that makes up the center of San Juan Bautista island. The stock intrudes Devonian graywacke, mudstone, and siltstone of the Port Refugio Formation, which crops out along the entire coastline of the island (Eberlein and others, 1983; Brew, 1996). The occurrence consists of minor pyrite and chalcopyrite disseminated in diorite (Clark and others, 1970 [OF 418]).

Alteration:

Age of mineralization:
Probably related to the emplacment of Cretaceous diorite.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Production notes:

Reserves:

Additional comments:
The subsurface rights to the land in the vicinity of this prospect are held by the Sealaska Corporation.

References:
Clark and others, 1970 (OF 418); Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Clark and others, 1970 (OF 418)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of Klawock Lake)

Site type: Occurrences

ARDF no.: CR096

Latitude: 55.4906 **Quadrangle:** CR B-3

Longitude: 132.9819

Location description and accuracy:

The descriptions that have been published do not provide exact locations of the several mineralized samples that define this site, but they are generally in the S1/2 section 32, T. 73 S., R. 82 E., and the N1/2 section 5, T. 74 S., R. 82 E. The coordinates are at about the center of the mineralized area.

Commodities:

Main: Ag, Pb, Zn

Other:

Ore minerals: Galena, pyrite, pyrrhotite, sphalerite

Gangue minerals: Quartz

Geologic description:

Hedderly-Smith (1999 [Inventory]) identified several mineral occurrences in this area by following up geochemical anomalies. The country rocks are mostly metamorphosed Silurian or Ordovician andesite of the Luck Creek Breccia or Descon Formation, and the deposits probably are at or near the periphery of a small syenite stock. A rock-chip sample from a borrow pit in the southeast corner of section 32 contained 216 parts per million (ppm) lead and 2,100 ppm zinc; further examination revealed pyrite-sphalerite veinlets in silicified rhyodacite(?). In the northwest corner of section 5, brecciated rhyodacite(?) with a matrix composed of quartz with minor pyrite, pyrrhotite, sphalerite, and galena, forms a zone 20-60 feet wide; a sample contained 232 ppm lead, more than 2 percent zinc, and 2.3 ppm silver.

Alteration:

Silicification of volcanic rocks.

Age of mineralization:

The deposits may be related to a small syenite stock of uncertain age.

Deposit model:

Base and precious-metal values in quartz veinlets and breccia.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only sampling by industry geologists.

Production notes:

Reserves:

Additional comments:
The Sealaska Corporation has the subsurface rights to the land in the vicinity of these occurrences.

References:
Hedderly-Smith, 1989; Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (southwest of Harris Peak)

Site type: Occurrence

ARDF no.: CR097

Latitude: 55.4610 **Quadrangle:** CR B-3

Longitude: 132.8182

Location description and accuracy:
This occurrence is along the Klawock-Hollis road near the northeast corner of section 17, T. 74 S., R. 83 E.

Commodities:

Main: Cu

Other: Ag, Au, Zn

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
Clark and others (1970 [OF 417]) report pyrite and chalcopyrite in greenstone at this site. The greenstone is probably metamorphosed Silurian or Ordovician basalt or andesite of the Descon Formation or Luck Creek Breccia (Eberlein and others, 1983; Brew, 1966). Maas and others (1992) collected two samples from a quartz vein in greenstone and black slate at about this location . The samples contained up to 124 parts per billion gold, 0.7 parts per million (ppm) silver, 133 ppm copper, and 882 ppm zinc.

Alteration:

Age of mineralization:

Deposit model:
Quartz vein?

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:
Clark and others, 1970 (OF 417); Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Clark and others, 1970 (OF 417)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Harris River; Julia; Rogers; Dunton; Kasaan Gold

Site type: Mine

ARDF no.: CR098

Latitude: 55.4615 **Quadrangle:** CR B-3

Longitude: 132.7090

Location description and accuracy:

The Harris River Mine is on the north bank of the Harris River, about 0.5 mile above its mouth. It is about 0.6 mile south-southwest of the center of section 7, T. 74 S., R. 84 E. and is marked by old mining equipment in the river. Several early geologists, notably Wright and Wright (1908), combine their descriptions of the Harris River and Dawson (CR099) mines. They are different properties, however, and are described separately in this report.

Commodities:

Main: Ag, Au, Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

The Harris River Mine is in a band of black graphic slate and quartzite; however, most of the rocks exposed along the river for several hundred yards above and below the mine are massive to schistose, intermediate to felsic volcanic rocks of the Silurian and Ordovician Descon Formation (Sales, 1916; Herreid and Rose, 1966; Wilcox, 1938 [PE 119-5]; D.J. Grybeck, unpublished field notes, 1984). The deposit consists of quartz-cemented brecciated slate and conformable quartz veins and lenses in the slate; the width of the mineralized zone varies from 1 to 12 feet and averages about 6 feet (Sales, 1916; Wilcox, 1938 [PE 119-5]; Herreid and Rose, 1966). Fine-grained to porphyritic dikes commonly are conformable to the foliation but crosscut the veins. The individual quartz veins and lenses are several inches to 1 or 2 feet thick. Sulfides, mainly disseminated pyrite and rare galena and sphalerite, are sparse; the best ore was associated with the most abundant pyrite.

When visited by Sales (1916), the workings consisted of a 280-foot shaft inclined at 30 degrees, with levels at 50, 100, and 200 feet. About 4,000 to 6,000 tons of ore had been produced; the ore averaged about $7.00 per ton in gold (at $20.67 per ounce) and some ran as high as $60 in gold per ton. By the time Wilcox (1938 [PE 119-5]) visited the property, the shaft had been extended to a depth of 700 feet and there were 2,600 feet of additional underground workings. A small 5-stamp mill was built in 1918 and there was intermittent production until the 1930's. The total production was substantial but uncertain because the mill treated ore from other mines in the area. Maas and others (1991) indicate that the total production from 1910 to 1929 (from the mine or the mill?) was 5,814 ounces of gold, 6,457 ounces of silver, 4,390 pounds of copper, and 1,159 pounds of lead from 8,173 tons of ore.

Alteration:

Age of mineralization:

Unknown, other than that the deposit is Silurian or Ordovician, or younger.

Deposit model:

Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status:

Site Status:

Workings/exploration:
When visited by Sales (1916), the workings consisted of a 280-foot shaft inclined at 30 degrees, with levels at 50, 100, and 200 feet. By the time Wilcox (1938 [PE 119-5]) visited the property, the shaft had been extended to a depth of 700 feet and there were an additional 2,600 feet of underground workings.

Production notes:
When visited by Sales (1916), about 4,000 to 6,000 tons of ore had been produced; the ore averaged about $7.00 per ton in gold (at $20.67 per ounce), and some ran as high as $60 in gold per ton. By the time Wilcox (1938 [PE 119-5]) visited the property, the shaft had been extended to a depth of 700 feet and there were 2,600 feet of additional underground workings. A small 5-stamp mill was built in 1918 and there was intermittent production until the 1930's. The total production was substantial but uncertain because the mill also treated ore from other mines in the area. Maas and others (1991) indicate that the total production from 1910 to 1929 (from the mine or the mill?) was 5,814 ounces of gold, 6,457 ounces of silver, 4,390 pounds of copper, and 1,159 pounds of lead from 8,173 tons of ore.

Reserves:
None.

Additional comments:

References:
Wright and Wright, 1908; Sales, 1916; Mertie, 1921; Wilcox, 1938 (PE 119-5); Herreid and Rose, 1966; Cobb, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Dawson

Site type: Mine

ARDF no.: CR099

Latitude: 55.4705 **Quadrangle:** CR B-3

Longitude: 132.7053

Location description and accuracy:

The Dawson Mine is named on the USGS 1:63,360-scale topographic map. It is about 0.1 mile north of the center of section 7, T. 74 S., R. 84 E. The workings extend south to just north of the Hollis-Klawock road. Herreid and Rose (1966, figure 3) provide a map of the workings of the mine. Several early geologists, notably Wright and Wright (1908), combine their descriptions of the Dawson and Harris River (CR098) mines. They are different properties, however, and are described separately in this report.

Commodities:

Main: Ag, Au, Cu, Pb

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

Herreid and Rose (1966) mapped the rocks in the vicinity of the Dawson Mine as graywacke, banded siltstone and argillite with minor slate, limestone and phyllite, and interbedded black slate and siltstone. They are part of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996).

The deposit consists of quartz veins and stringers that generally strike about N35E and dip northwest at about 28 degrees (Smith, 1914; Mertie, 1921; Roehm, 1936 [PE 119-2]; Wilcox, 1938[119-5]). The veins are in a zone 2 to more than 6 feet thick. Most of the value is in free gold that occurs along contacts between quartz stringers and slate; minor amounts of sulfides including pyrite, sphalerite, chalcopyrite, and galena are disseminated in the veins and country rocks. Pyritized, fine-grained felsic dikes parallel and crosscut the veins. There are two principal veins, the Free Gold and Humboldt. Only the Freegold vein was mined; it extends for about 210 feet along strike but it is segmented by several near-horizontal faults.

In the 1980's and 1990's, a considerable area was stripped and trenched just north of the Hollis-Klawock road (D.J. Grybeck, unpublished field notes, 1984 and 1991). Three veins, 10-24 inches thick, were exposed that dip west at about 26-55 degrees. The veins are in deformed black shale with graphitic partings; the footwalls for up to several feet from the veins are highly sheared gouge zones. The veins contain up to 1 percent sulfides, mainly pyrite and sphalerite. Three short(?) adits were driven on the veins in this area. In the 1990s, a road had been cleared to the older workings and mill site to the north. About 200 feet higher in elevation, there were several drill sites in the vicinity of the old workings and the mill. Several selected samples of quartz vein material from dumps at the old mill site contained up to 1,000 parts per million (ppm) silver, 700 ppm arsenic, 3,000 ppm copper, 1,000 ppm antimony, more than 1 percent zinc, and 59 ppm gold, but most values were much lower.

Maas and others (1991) sampled most of the accessible workings. Their samples had a wide range of values, but several of the quartz veins contained 0.3 to more than 5 ounces of gold per ton, up to several ounces of silver per ton, and lead, zinc, and copper values that reflect as much as 1 to 2 percent sulfides in the veins.

Claims were first staked before 1908 but apparently little work was done on the property until 1920, when the Kasaan Gold Company began exploring it (Herreid and Rose, 1966). The mine was developed by 2 short crosscut tunnels and at least 150 feet of underground workings. In 1938, Roehm (1936 [PE 119-2]) reported that about $22,000 in gold (at $35 per ounce?) had been produced since 1933; the ore ran about $20 to $30 in gold per ton. Wilcox (1938 [PE 119-5])--who may have been describing the Harris River Mine (CR098) to the south-- indicated that the total production was about $16,000 to $17,000 in gold (at $35 per ounce?). His samples assayed up to about $30 in gold per ton across 5 feet. Maas and others indicate that the mine operated intermittently from the 1930's to 1952, with a total production of nearly 10,000 ounces of gold, 7,000 ounces of silver, and minor lead and copper. There was a small mill on the property. The property was restaked in 1976, and from 1979 to 1981, MAPCO, Inc. explored the property and drilled several holes. Discovery Gold Explorations, Inc. drilled 5 holes in 1984 and several more holes in 1985 (Harris, 1985). The drilling defined a resource of 43,800 tons of ore averaging about 1 ounce of gold per ton. The property has recently been acquired by Red Diamond Mining Company and was active as of May, 2004 (Barnett and Clough, 2000; and http://www.reddiamondmining.com/).

Alteration:

None specifically mentioned, although the felsic dikes that cross the veins commonly are bleached and altered.

Age of mineralization:

Unknown, other than that the veins are in Silurian or Ordovician black shale and graywacke.

Deposit model:

Gold-quartz vein (Cox and Singer, 1986, model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: Yes; small

Site Status: Active

Workings/exploration:

Claims were first staked before 1908 but apparently little work was done on the property until 1920, when the Kasaan Gold Company began exploring it (Herreid and Rose, 1966). The mine was developed by 2 short crosscut tunnels and at least 150 feet of underground workings. There was a small mill on the property. The property was restaked in 1976, and from 1979 to 1981, MAPCO, Inc. explored the property and drilled several holes. Discovery Gold Explorations, Inc. drilled 5 holes in 1984 and several more holes in 1985 (Harris, 1985). The property has recently been acquired by Red Diamond Mining Company and was active as of May, 2004 (Barnett and Clough, 2000; and http://www.reddiamondmining.com/).

Production notes:

In 1938, Roehm (1936 [PE 119-2]) reported that about $22,000 in gold (at $35 per ounce?) had been produced since 1933; the ore ran about $20 to $30 in gold per ton. Wilcox (1938 [PE 119-5])--who may have been describing the Harris River Mine (CR098) to the south-- indicated that the total production was about $16,000 to $17,000 in gold (at $35 per ounce?). His samples assayed up to about $30 in gold per ton across 5 feet. Maas and others indicate that the mine operated intermittently from the 1930's to 1952, with a total production of nearly 10,000 ounces of gold, 7,000 ounces of silver, and minor lead and copper. There was a small mill on the property but it is unclear how much of the Dawson ore was milled there and how much was milled at the mill of the Harris River Mine (CR098).

Reserves:

Discovery Gold Explorations, Inc. drilled 5 holes in 1984 and several more holes in 1985 (Harris, 1985). The drilling defined a resource of 43,800 tons of ore averaging about 1 ounce of gold per ton.

Additional comments:

References:

Brooks, 1902; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Knopf, 1910; Knopf, 1911; Smith, 1914; Brooks, 1914; Brooks, 1915; Chapin, 1916; Chapin, 1918; Chapin, 1919; Martin, 1919; Martin, 1920; Mertie, 1921; Brooks, 1922; Brooks, 1923; Brooks and Capps, 1924; Brooks, 1925; Buddington, 1926; Smith, 1926; Moffit, 1927; Buddington and Chapin, 1929; Smith, 1929; Smith, 1930 (B 810); Smith, 1930 (B 813); Smith, 1932; Smith, 1933 (B 836); Smith, 1933 (B 844-A); Roehm, 1936 (PE 119-2); Wilcox, 1938 (PE 119-5); Smith, 1941; Smith, 1942 (B 933-A); Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Mitchell, 1982; Eberlein and others, 1983; Harris, 1985; Mitchell, 1986; Maas and others, 1991; Maas and others, 1995; Brew, 1996; Barnett and Clough, 2000.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Cascade; Snowdrift

Site type: Mine

ARDF no.: CR100

Latitude: 55.4836 **Quadrangle:** CR B-3

Longitude: 132.7350

Location description and accuracy:
The Cascade Mine is probably about 0.2 mile northwest of the center of section 1, T. 74 S., R. 83 E. and 1.6 miles southwest of the Puyallup Mine (CR103), which is named on the USGS 1:63,360-scale topographic map. In recent years, several workers have not been able to find the property (Herreid and Rose, 1966; Maas and others, 1991).

Commodities:

Main: Ag, Au

Other: Cu, Pb, Zn

Ore minerals: Chalcopyrite, galena, gold, pyrite, silver, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:
The rocks in the vicinity of the Cascade Mine are graywacke, siltstone, shale, and minor limestone of the Descon Formation of Silurian and Ordovician age (Herreid and Rose, 1966). A small granodiorite-quartz diorite intrusion is nearby. The deposit is a quartz-calcite vein about 2 feet wide that strikes N53W and dips 70 SW (Wright and Wright, 1908; Roehm, 1939 [PE 119-17]; Herreid and Rose, 1966; Maas and others, 1995). The vein contains chalcopyrite, pyrite, silver, sphalerite, galena, and gold in varying amounts from sparse to nearly massive ore. As described by Roehm (1939 [PE 119-17]), an upper tunnel followed the vein for 175 feet. A lower tunnel did not intersect the vein. The vein is irregular, banded and cut by numerous faults. The best gold values are associated with concentrations of sulfides. Several samples of the vein in the tunnel contained up to 0.24 ounce of gold per ton and 1.60 ounces of silver per ton. A sulfide-rich lens on the surface nearby could not be sampled but is said to have much higher values, reportedly nearly $100 per ton in gold and silver.

The Cascade deposit was found in 1900 and the following year two tunnels, 50 and 240 feet long, were driven on the property (Wright and Wright, 1908; Roehm, 1939 [PE 119-17]). During the development, a large gold-rich boulder on the property was broken up and shipped. In 1914, an arrastre was built and produced 30 ounces of gold. In 1915, a small stamp mill was installed and produced a small amount of gold. The property remained idle until 1932 when it was restaked. The property was restaked again in 1938 and the mill was upgraded with modern equipment. As of 1995, there was an active claim on the property (Maas and others, 1995).

The deposit at the nearby Snowdrift prospect is similar to the one at the Cascade Mine, as are several other properties in the area, one of which is marked by a caved adit (Chapin, 1916; Herreid and Rose, 1966).

Alteration:

Age of mineralization:
Unknown, other than that the vein is in Silurian or Ordovician rocks.

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: Yes; small

Site Status: Active

Workings/exploration:
The Cascade deposit was found in 1900 and the following year two tunnels, 50 and 240 feet long, were driven on the property (Wright and Wright, 1908; Roehm, 1939 [PE 119-17]). During the development, a large gold-rich boulder on the property was broken up and shipped. In 1914, an arrastre was built and produced 30 ounces of gold. In 1915, a small stamp mill was installed and produced a small amount of gold. The property remained idle until 1932 when it was restaked. The property was restaked again in 1938 and the mill was upgraded with modern equipment. As of 1995, there was an active claim on the property (Maas and others, 1995).

Production notes:
Somewhat more than 30 ounces of gold.

Reserves:
None.

Additional comments:

References:
Wright and Wright, 1905; Wright and Wright, 1908; Brooks, 1915; Chapin, 1916; Roehm, 1939 (PE 119-17); Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995.

Primary reference: Roehm, 1939 (PE 119-17)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Crackerjack

Site type: Mine

ARDF no.: CR101

Latitude: 55.4896

Quadrangle: CR B-3

Longitude: 132.7023

Location description and accuracy:

The main adit of the Crackerjack Mine, Adit No. 2, is at an elevation of about 800 feet, about 0.5 mile south of the Puyallup Mine, which is shown on the USGS 1:63,360-scale topographic map. The adit is on what is locally called Crackerjack Creek, near the middle of the south boundary of section 31, T. 73 S., R. 84 E. The property consists of ten claims and numerous workings that are shown on figure 2 of Herreid and Rose (1966).

Commodities:

Main: Ag, Au

Other: As, Cu, Pb, Sb, Zn

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite, tetrahedrite

Gangue minerals: Quartz

Geologic description:

The rocks in the vicinity of the Crackerjack Mine are mainly thinly interbedded black slate and black siltstone and subordinate argillite and graywacke that are part of the Descon Formation of Silurian and Ordovician age (Herreid and Rose, 1966). The mineralization at the Crackerjack Mine consists of two parallel quartz veins about 100 feet apart that closely follow two porphyry dikes for over a mile (Wright and Wright, 1908; Roehm, 1938 [PE 119-7]; Herreid and Rose, 1966; Maas and others, 1991; Maas and others, 1995). The veins and dikes strike about N20-30W and dip 20-48SW. Various workers have called the dikes gray porphyritic diorite, green porphyry, greenstone, and dacite porphyry. Near the veins, the dikes are intensely altered to quartz, pyrite, calcite, chlorite, and epidote. The quartz veins are banded and vary from 1 to 5 feet wide. They contain free gold, and, in order of abundance: pyrite, chalcopyrite, galena, sphalerite, tetrahedrite, and an antimony or bismuth sulfosalt. The gold is most abundant with the sulfides. The ore occurs in shoots that Roehm (1938 [PE 119-7]) suggests rake gently to the west; they were formed along rolls or irregularities in shear zones along the veins.

The Crackerjack Mine was discovered prior to 1902 (Brooks, 1902). By 1938, there were 8 tunnels and numerous open cuts and trenches for about 6,000 feet along the west side of what is locally called Crackerjack Creek (Roehm, 1938 [PE 119-7]; Herreid and Rose, 1966, figure 2). Most of the workings apparently were driven before 1909. Maas and others (1991; 1995, figure 18) mapped and sampled extensively in the workings; the gold content of their samples varied widely from almost nothing to several ounces per ton. Roehm's map (1938 [PE 119-7]) shows the location of 176 samples across the veins; they contained from a trace to 14.14 ounces of gold per ton and a trace to 29.41 ounces of silver per ton. He also cites an old report of 185 channel samples that averaged $7.50 per ton in gold (at $20.67 per ounce). Apparently there has been no production since 1908 and little activity until recently, other than patenting the claims in 1926 (Maas and others, 1995). The property recently was acquired by Red Diamond Mining Company and is active as of March 2004 (Barnett and Clough, 2000; http://www.reddiamondmining.com/).

A mill was in operation before 1905 at the nearby Puyallup Mine (CR103) that processed ore from both the Puyallup and Crackerjack mines (Wright and Wright, 1905). Bureau of Mines production records cited by Maas and others (1991) indicate that from 1900 to 1916, the two mines produced an estimated 10,466 ounces of gold; the average grade was 0.840 ounce of gold per ton and 0.668 ounce of silver per ton.

Alteration:
The dikes that are associated with the gold-quartz veins are intensely altered to quartz, pyrite, calcite, chlorite, and epidote near the veins.

Age of mineralization:
Unknown, other than that the veins are in Silurian or Ordovician rocks.

Deposit model:
Gold-quartz veins (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Active

Workings/exploration:
The Crackerjack Mine was discovered prior to 1902 (Brooks, 1902). By 1938, there were 8 tunnels and numerous open cuts and trenches for about 6,000 feet along the west side of what is locally called Crackerjack Creek (Roehm, 1938 [PE 119-7]; Herreid and Rose, 1966, figure 2). Most of the workings apparently were driven before 1909. Apparently there has been no production since 1908 and little activity until recently, other than patenting the claims in 1926 (Maas and others, 1995). Maas and others (1991; 1995, figure 18) mapped and sampled extensively in the workings. The property recently was acquired by Red Diamond Mining Company and is active as of March 2004 (Barnett and Clough, 2000; http://www.reddiamondmining.com/).

Production notes:
A mill was in operation before 1905 at the nearby Puyallup Mine (CR103) that processed ore from both the Puyallup and Crackerjack mines (Wright and Wright, 1905). Bureau of Mines production records cited by Maas and others (1991) indicate that from 1900 to 1916, the two mines produced an estimated 10,466 ounces of gold; the average grade was 0.840 ounce of gold per ton and 0.668 ounce of silver per ton. Apparently there has been no production since 1908 from the Crackerjack Mine.

Reserves:
Probably none.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Brooks, 1911; Smith, 1914; Brooks, 1915; Chapin, 1916; Chapin, 1918; Chapin, 1919; Mertie, 1921; Smith, 1936; Roehm, 1938 (PE 119-7); Herreid and Rose, 1966; Cobb, 1978; Bufvers, 1967; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Barnett and Clough, 2000.

Primary reference: Herreid and Rose, 1966; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Copper Hill

Site type: Prospect

ARDF no.: CR102

Latitude: 55.4944 **Quadrangle:** CR B-3

Longitude: 132.6856

Location description and accuracy:

The Copper Hill prospect is about 0.6 mile east-southeast of the Puyallup Mine which is named on the USGS 1;63,360-scale topographic map. The prospect is about 0.3 mile west-southwest of the center of section 32, T. 73 S., R. 84 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals:

Geologic description:

The deposit at the Copper Hill prospect is a network of chalcopyrite veinlets in sheared greenstone (Brooks, 1902; Chapin, 1918). The property was explored by surface stripping in 1916 but apparently there has been no work on the property since. The greenstone is probably basalt or andesite of the Descon Formation of Silurian and Ordovician age (Herreid and Rose, 1966).

Alteration:

Age of mineralization:

Unknown, other than that the deposit is in Silurian or Ordovician rocks.

Deposit model:

Chalcopyrite veinlets in greenstone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Only a little surface stripping.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Chapin, 1918; Herreid and Rose, 1966; Cobb, 1978.

Primary reference: Chapin, 1918

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Puyallup; Hope; Ready Bullion; Lucky Jack

Site type: Mine

ARDF no.: CR103

Latitude: 55.4974 **Quadrangle:** CR B-3

Longitude: 132.6996

Location description and accuracy:
The Puyallup Mine is a well known property that is named on the USGS 1:63,360-scale topographic map. It is about 0.1 mile east of the center of section 31, T. 73 S., R. 84 E. The mine has considerable workings; the coordinates are at the portal of the main adit. The workings are shown on figure 2 of Herreid and Rose (1966).

Commodities:

Main: Ag, Au

Other: Cu, Pb, Te, Zn

Ore minerals: Galena, gold, pyrite, sphalerite, unidentified telluride

Gangue minerals: Quartz

Geologic description:
The rocks in the vicinity of the Puyallup Mine are graywacke, conglomerate, andesite, and slate of the Descon Formation of Silurian and Ordovician age; they generally strike northwest and dip 20-40SW (Eberlein and others, 1983; Brew, 1996). The deposit consists of auriferous sulfide-bearing quartz veins (Brooks, 1902; Wright and Wright, 1908; Roehm, 1936 [PE 119-4]; Herreid and Rose, 1966; Maas and others, 1991, 1995). The main vein is generally 7 to 8 inches wide but locally widens to 3 feet; it trends about N25W and dips about 35NE.(Herreid and Rose, 1966). The quartz is banded and the vein commonly follows a light-gray porphyritic dike. The quartz contains sparse free gold, pyrite, galena, and a little sphalerite; tellurides are reported. There are several smaller, similar veins.

The deposit was discovered prior to 1902 and developed by several open cuts, a short shaft, 5 adits--including one 1,135 feet long and another 220 feet long--several stopes, and at least 2,865 feet of other underground workings (Brooks, 1902). In 1990, the underground workings were either unsafe or caved (Maas and others, 1991). The property has recently been acquired by Red Diamond Mining Company and is active as of March, 2004 (Barnett and Clough, 2000; http://www.reddiamondmining.com/).

A mill was in operation before 1905 (Wright and Wright, 1905) that processed ore from both the Puyallup and Crackerjack (CR101) mines. Brooks (1902) reports a shipment of 14 tons of ore (in 1901?) that returned $159 per ton (probably mainly in gold at $20.67 per ounce). Bureau of Mines production records cited by Maas and others (1991) indicate that the peak production was from 1900 to 1916 with an estimated total recovery of 10,466 ounces of gold. The average grade of the ore was 0.840 ounce of gold per ton and 0.668 ounce of silver per ton. This production probably included ore from both the Puyallup and Crackerjack (CR101) mines. Roehm (1936 [PE 119-4]) records considerable activity from 1933 to 1938 (after the price of gold rose to $35 per ounce), but only about $3,100 of gold was produced. Maas and others (1995) indicate that it is difficult to determine the production from the Puyallup Mine; they can only substantiate recovery of about 650 ounces of gold and 473 ounces of silver from 815 tons of ore mined between 1915 and 1946. However, they also note that there was considerable production before 1915.

Alteration:
None specifically noted (but see the nearby Crackerjack Mine (CR101) for details of the alteration of the dikes near the veins).

Age of mineralization:
Unknown, other than that the veins cut Silurian or Ordovician rocks.

Deposit model:
Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Active

Workings/exploration:
The deposit was discovered prior to 1902 and developed by several open cuts, a short shaft, 5 adits--including one 1,135 feet long and another 220 feet long--several stopes, and at least 2,865 feet of other underground workings (Brooks, 1902). In 1990, the underground workings were either unsafe or caved (Maas and others, 1991). The property has recently been acquired by Red Diamond Mining Company and is active as of March, 2004 (Barnett and Clough, 2000; http://www.reddiamondmining.com/).

Production notes:
A mill was in operation before 1905 (Wright and Wright, 1905) that processed ore from both the Puyallup and Crackerjack (CR101) mines. Brooks (1902) records a shipment of 14 tons of ore (in 1901?) that returned $159 per ton (probably mainly in gold at $20.67 per ounce). Bureau of Mines production records cited by Maas and others (1991) indicate that the peak production was from 1900 to 1916 with an estimated total production of 10,466 ounces of gold; the average grade was 0.840 ounce of gold per ton and 0.668 ounce of silver per ton. This production probably included ore from both the Puyallup and Crackerjack (CR101) mines. Roehm (1936 [PE 119-4]) records considerable activity from 1933 to 1938 (after the price of gold rose to $35 per ounce), but only about $3,100 of gold was produced. Maas and others (1995) indicate that the production specifically from the Puyallup Mine is difficult to determine; they can only substantiate recovery of about 650 ounces of gold and 473 ounces of silver from 815 tons of ore mined between 1915 and 1946. However, they also note that there was considerable production before 1915.

Reserves:
Probably none.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright and Wright, 1908; Smith, 1914; Brooks, 1915; Chapin, 1916; Smith, 1917 (B 142); Chapin, 1918; Smith, 1936; Roehm, 1936 (PE 119-4); Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Barnett and Clough, 2000.

Primary reference: Roehm, 1936 (PE 119-4); Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Big Harbor

Site type: Mine

ARDF no.: CR104

Latitude: 55.3745 **Quadrangle:** CR B-3

Longitude: 132.9639

Location description and accuracy:
The Big Harbor Mine is on the north side of upper Trocadero Bay, about 0.3 mile north-northeast of the (misplaced) mine symbol on the USGS 1;63,360-scale topographic map. The mine is about 0.5 mile southwest of the center of section 9, T. 75 S., R. 82 E. The location of the mine and its workings are is shown in detail on figure 19 of Maas and others (1995).

Commodities:

Main: Cu, Zn

Other: Ag, Au

Ore minerals: Chalcopyrite, magnetite, pyrite, sphalerite

Gangue minerals:

Geologic description:
The best description of the geology of the deposit at the Big Harbor Mine is in Maas and others (1995), whose report is largely based on a modern interpretation of Pittman's work (1960). The rocks in the vicinity of the deposit were originally felsic to intermediate tuffs, flows and pyroclastics interbedded with argillite, sandstone, and chert. The rocks subsequently underwent greenschist-grade metamorphism to form greenstone, greenschist, and quartz-sericite schist with a strong penetrative fabric. The rocks have been variously dated. Eberlein and others (1983) and Newkirk and others (1993) considered them to be part of of the Descon Formation of Silurian and Ordovician age. They are now generally considered to be part of the Wales Group of Cambrian and older age, mainly on the basis of their penetrative fabric and degree of metamorphism (D.J. Grybeck, unpublished field notes, 1984; Maas and others, 1995; Brew, 1996). Recent detailed geochemical and isotope analyses by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age.
The origin of the deposit was variously interpreted prior to the 1950's (Knopf, 1911; Smith, 1914; Chapin, 1918; Twenhofel and others, 1949), but it now is considered to be a volcanogenic massive-sulfide deposit (Newkirk and others, 1993; Maas and others, 1995). It consists of stratiform lenses of pyrite and chalcopyrite with minor sphalerite and magnetite, near a contact between quartz-mica schist and greenstone and greenschist. At the eastern and most extensive workings, a lens of mineralized rock that contains 1.0 to 1.2 percent copper is about 16 to 29 feet thick and extends along strike for about 650 feet. The lens strikes about west and dips about 80N. There are numerous smaller lenses of nearly massive chalcopyrite and pyrite. The lenses are truncated by faults and often pinch and swell along strike. Assays largely reflect the the sulfide content of the masses of ore; some lenses that consist of 1 to 3 feet of chalcopyrite and pyrite contain more than 15% copper. The gold and silver content of the lenses is low. The best gold value in many samples collected by Maas and others (1991, 1995) was 3.5 parts per million (ppm) gold. One high-grade sample contained 1.59 ounces of silver per ton, and 1 sample contained 7.37 percent zinc; most values, however, were much lower. No samples contained more than 871 ppm lead.
The deposit was discovered about 1902 and operated intermittently until 1917 (Knopf, 1911; Brooks, 1912, 1913, 1914,1915; Smith,1914; Chapin, 1916, 1918, 1919; Twenhofel and others, 1949; Roppel, 1991) . The property was acquired by the Northland Development Company in 1908 and they shipped ore in 1912 and 1913. In 1915 or 1916, the mine was taken over by the Southeastern Copper Company, who

made a small ore shipment in 1916. No ore has been shipped since. The total production is 136 tons of ore shipped from 1913 to 1916 that contained about 6 to 7 percent copper.

The property was examined by the U.S. Geological Survey in 1944 (Twenhofel and others, 1949) and by the Bureau of Mines in 1958 (Pittman, 1960). The property was restaked by Juan Munoz of Ketchikan in about 1954 and was held by him for at least a decade (D.J. Grybeck, personal interviews with several of the participants, 1984). Eight holes were drilled on the property in 1958, and in the mid-60's the U.S. Bureau of Mines and a private consultant ran several EM and IP lines across the trend of the mineralization; more IP work was done by a private company in 1970. According to Maas and others (1995), the property was examined by Montana Phosphate Products Company in 1957 and 1958, Texas Gulf, Inc. in 1974, and Homestake Mining Company in 1974. The Big Harbor Mine is on land selected by Sealaska Inc. in the mid-70's as part of the Alaska Native Claims Settlement Act, and since then the property has been examined by Anaconda Copper Company in the late 70's, by Exxon Minerals about 1985, and by Cominco Exploration in the early 1990's (Newkirk and others, 1993).

The mine workings are in two mineralized zones about 0.5 mile apart; the workings include four adits, an inclined shaft, several crosscuts and drifts, a 120-foot decline, and numerous pits and trenches. The best description of the workings and their location is in the text and figures of Twenhofel and others (1949), and in the text and on figure 19 of Maas and others (1995).

Pittman (1960) estimated that there is an indicated resource of about 1,450 tons of mineralized rock with 1.0 to 1.2 percent copper for each vertical foot in an orebody that is 16 to 29 feet thick and extends for about 650 feet along strike.

Alteration:

Age of mineralization:

Volcanogenic massive sulfide copper deposit in Cambrian or older rocks.

Deposit model:

Probably a Kuroko massive sulfide deposit (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

28a

Production Status: Yes

Site Status: Active

Workings/exploration:

The mine workings are in two mineralized zones about 0.5 mile apart; the workings include four adits, an inclined shaft, several crosscuts and drifts, a 120-foot decline, and numerous pits and trenches. The best description of the workings and their location is in the text and figures of Twenhofel and others (1949), and in the text and on figure 19 of Maas and others (1995).

Production notes:

The deposit was discovered about 1902 and operated intermittently until 1917 (Knopf, 1911; Brooks, 1912, 1913, 1914, 1915; Smith,1914; Chapin, 1916, 1918, 1919; Twenhofel and others, 1949; Roppel, 1991). The property was acquired by the Northland Development Company in 1908 and they shipped ore in 1912 and 1913. In 1915 or 1916, the mine was taken over by the Southeastern Copper Company, who made a small ore shipment in 1916. No ore has been shipped since. The total production is 136 tons of ore shipped from 1913 to 1916 that contained about 6 to 7 percent copper.

Reserves:

Pittman (1960) estimated that there is an indicated resource of about 1,450 tons of mineralized rock with 1.0 to 1.2 percent copper for each vertical foot in an orebody that is 16 to 29 feet thick and extends for about 650 feet along strike. He did not predict the vertical extent of the ore body.

Additional comments:

This Big Harbor Mine is on or surrounded by land to which the Sealaska Corporation holds the subsurface rights.

References:

Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1914; Smith, 1914; Brooks, 1915; Chapin, 1916; Chapin, 1918; Chapin, 1919; Brooks, 1921; Twenhofel and others, 1949; Pittman, 1960; Cobb, 1978; Eberlein and others, 1983; Glavinovich, 1987; Hedderly-Smith, 1991 (1990 season); Maas and others, 1991; Roppel, 1991; Hedderly-Smith, 1992 (1991 season); Newkirk and others, 1993; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of head of Twelvemile Arm)

Site type: Occurrences

ARDF no.: CR105

Latitude: 55.3606 **Quadrangle:** CR B-3

Longitude: 132.8644

Location description and accuracy:

The area of this site was examined by Clark and others (1970 [OF 417]) and by D.J. Grybeck (unpublished field notes, 1980). In May 1980, red flagging marked locations along the creek where private industry had taken samples and one or more claims were probably staked. The site is about 0.5 mile southwest of the center of section 18, T. 75 S., R. 83 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:

Clark and others (1970 [OF 417]) noted greenschist with pyrite and chalcopyrite near this site, and Grybeck (unpublished field notes and analyses, 1980) noted quartz-sericite schist and subordinate quartz-chlorite schist in the banks of the creek. The rocks are part of the Wales Group of Cambrian and older age (Brew, 1996). Grybeck did not observe base-metal mineralization, but up to about 5 percent pyrite is widely disseminated in the schist. Much red flagging was present in 1980, and the area has probably been claimed or sampled by private industry. Grybeck collected several random samples of the pyritiferous schist; none contained significant metal values.

Alteration:

Age of mineralization:

A metalliferous horizon in Cambrian or older felsic schist.

Deposit model:

Pyritiferous metafelsite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

None noted other than flagging from claim staking or sampling.

Production notes:

Reserves:

Additional comments:

References:

Clark and others, 1970 (OF 417); Cobb, 1978.

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near 'Cable Creek')

Site type: Occurrence

ARDF no.: CR106

Latitude: 55.3539 **Quadrangle:** CR B-3

Longitude: 132.8380

Location description and accuracy:
This occurrence is in an outcrop on the east side of the Hydaburg road at the bridge over locally-named Cable Creek. It is near the center of the NW1/4 section 20, T. 75 S., R. 83 E.

Commodities:

Main: Ag, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Chlorite, quartz, sericite

Geologic description:
This mineralization, at a roadside outcrop, has been known since at least the 1980's, when industry was searching for volcanogenic massive-sulfide deposits and staked claims throughout the area. The outcrop consists of about 200 feet of chlorite-quartz schist and sericite-quartz schist, possibly derived from a felsic volcanic protolith. The rocks are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). Locally, the rocks contain chalcopyrite, sphalerite, and up to 20 percent pyrite; there is minor copper staining. Grab samples of the sulfide-rich layers contained up to 1 part per million (ppm) silver, 2,000 ppm copper, and 500 ppm zinc (D.J. Grybeck, unpublished analyses, 1991). A selected sample collected by Maas and others (1995) contained 2.5 percent copper, 1.0 percent zinc, 790 parts per billion gold, and 11.6 ppm silver. They conclude that while the mineralization at this outcrop is limited in extent, it suggests the potential for volcanogenic massive sulfide deposits nearby in Wales Group rocks.

Alteration:

Age of mineralization:
A volcanogenic massive-sulfide deposit in Cambrian or older rocks.

Deposit model:
Probably a Kuroko massive sulfide deposit (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: None

Site Status: Undetermined

Workings/exploration:
This roadside outcrop has been sampled several times by government and industry geologists since at least the 1980's.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Nancy

Site type: Prospect

ARDF no.: CR107

Latitude: 55.3498 **Quadrangle:** CR B-3

Longitude: 132.8016

Location description and accuracy:
The location of this old prospect, which is described only by Chapin (1916), is not known precisely. It probably is about midway between the heads of Trocadero Bay and Twelvemile Arm, within a mile of the center of the SE1/4 section 21, T. 75 S., R. 83 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
The Nancy prospect is in greenstone interbedded with argillite and conglomerate (Chapin, 1916). The rocks are part of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). The deposit consists of a shear zone 25 feet wide that contains silicified greenstone with pyrite and chalcopyrite. Some quartz stringers also contain pyrite and chalcopyrite. A quartz vein 6 feet thick strikes N70E and dips 45NW. The only workings are shallow trenches.

Alteration:
Greenstone in a mineralized shear zone is silicified.

Age of mineralization:
Unknown, other than that the deposit is in Silurian and Ordovician rocks.

Deposit model:
Shear zone with chalcopyrite and pyrite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only surface trenching.

Production notes:

Reserves:

Additional comments:

References:
Chapin, 1916; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Chapin, 1916

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of upper Twelvemile Arm)

Site type: Occurrence

ARDF no.: CR108

Latitude: 55.3646 **Quadrangle:** CR B-3

Longitude: 132.7923

Location description and accuracy:
This occurrence is probably about 0.2 mile west of the top of hill 2150 and about 0.5 mile west-southwest of the center of section 15, T. 75 S., R. 83 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:
At this occurrence, Clark and others (1970 [OF 417] report pyrite and minor chalcopyrite in greenschist of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Pyrite and chalcopyrite occur in greenschist of the Wales Group of Late Proterozoic and Cambrian age.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only brief examination by government geologists.

Production notes:

Reserves:

Additional comments:

References:
Clark and others, 1970 (OF 417); Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Clark and others, 1970 (OF 417)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (southwest of head of Twelvemile Arm)

Site type: Prospect

ARDF no.: CR109

Latitude: 55.3441 **Quadrangle:** CR B-3

Longitude: 132.7622

Location description and accuracy:
This prospect is about 1.1 mile west-southwest of the head of Twelvemile Arm and about 0.2 mile east of the northwest corner of section 26, T. 75 S., R. 83 E. This is locality 2 of Herreid and Rose (1966), who suggest that it may be the Dolly Varden prospect. However, that prospect is probably about 3 miles to the east (CR110).

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals: Calcite

Geologic description:
As described by Herreid and Rose (1966), this prospect consists of an 18-foot adit and an 8-foot winze driven on a calcite vein. There are apparently no ore minerals in the vein. The rocks in the vicinity are interbedded marble, greenstone, and greenschist of the Wales Group of Cambrian and older age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
This apparently unmineralized quartz vein is in marble, greenstone, and greenschist of Cambrian or older age.

Deposit model:
Questionable deposit.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
An 18-foot adit and an 8-foot winze.

Production notes:

Reserves:

Additional comments:

References:

Herreid and Rose, 1966; Eberlein and others, 1983; Brew, 1996.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Dolly Varden

Site type: Prospect

ARDF no.: CR110

Latitude: 55.3426 **Quadrangle:** CR B-3

Longitude: 132.6887

Location description and accuracy:
Based on several old but probably reliable references (Brooks, 1902; Wright and Wright, 1908), the Dolly Varden prospect is at an elevation of about 1,100 feet, about 1.7 miles southeast of the head of Twelvemile Arm and about 0.6 mile northwest of the center of section 29, T. 75 S., R. 84 E. Herreid and Rose (1966), probably incorrectly, suggest that the Dolly Varden prospect is about 3 miles to the west at their locality 2 (which is ARDF CR109).

Commodities:

Main: Ag, Au

Other:

Ore minerals: Azurite, malachite, tetrahedrite

Gangue minerals: Quartz?

Geologic description:
As described by Brooks (1902) and Wright and Wright (1908), the deposit at the Dolly Varden prospect consists of auriferous (quartz?) veins that strike N15E and dip steeply to the SE or are vertical. The veins follow the layering in marble and contain tetrahedrite altered to azurite and malachite. The marble is part of the Wales Group of Cambrian and older age (Eberlein and others, 1983; Brew, 1996). There is no report of workings on these claims. Bufvers (1967) indicates that the quartz stringers occur in an area about 20 feet wide and 30 feet long. A sample taken in 1924 contained $80 a ton in gold and silver. Maas and others (1992, 1995) collected four samples that contained up to 20 parts per billion gold, 7.6 parts per million (ppm) silver, and 1,329 ppm copper.

Alteration:

Age of mineralization:
Veins cut marble of Cambrian or older age.

Deposit model:
Polymetallic vein? (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c?

Production Status: None

Site Status: Undetermined

Workings/exploration:
Apparently none.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Wedow and others, 1952; Herreid and Rose, 1966; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of head of Twelvemile Arm)

Site type: Prospect

ARDF no.: CR111

Latitude: 55.3312 **Quadrangle:** CR B-3

Longitude: 132.7337

Location description and accuracy:
This is locality 1 of Herreid and Rose (1966) and its location is accurate. It is about 1.2 miles south of the head of Twelvemile Arm and about 0.6 mile south-southwest of the center of section 25, T. 75 S., R. 83 E.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:
At this site, a series of discontinuous quartz veins that strike N10E and dip 80NW contain small amounts of chalcopyrite and tetrahedrite (Herreid and Rose, 1966). A sample of a vein contained 0.06 ounce of gold per ton and 8.64 ounces of silver per ton. The veins cut massive, light-gray dolomite that is part of the Wales Group of Cambrian and older age. The workings consist of a 110-foot adit and several prospect pits.

Alteration:

Age of mineralization:
Unknown, other than that the deposit consists of quartz veins that cut dolomite of Cambrian or older age.

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings consist of a 110-foot adit and several prospect pits.

Production notes:

Reserves:

Additional comments:

References:

Herreid and Rose, 1966.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Marble Heart

Site type: Prospect

ARDF no.: CR112

Latitude: 55.3225 **Quadrangle:** CR B-3

Longitude: 132.7325

Location description and accuracy:

The location of the Marble Heart prospect is uncertain. The primary and almost only description of it is by Brooks (1902). Herreid and Rose (1966) place it just outside the area they mapped. The Herreid and Rose location used for this record is about 1.8 miles south of the head of Twelvemile Arm and about 0.2 mile west of the center of section 36, T. 75 S., R. 83 E.

Commodities:

Main: Pb

Other:

Ore minerals: Galena

Gangue minerals:

Geologic description:

As described by Brooks (1902), the Marble Heart prospect consists of a small vein of galena in intensely folded and metamorphosed limestone. The limestone is part of the Wales Group of Cambrian and older age (Eberlein and others, 1983; Brew, 1996). The workings consist of a shaft about 20 feet deep and a short adit.

Alteration:

Age of mineralization:

Galena vein in limestone of Cambrian or older age.

Deposit model:

Galena vein in limestone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The workings consist of a shaft about 20 feet deep and a short adit.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Herreid and Rose, 1966; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (southwest of head of Twelvemile Arm)

Site type: Occurrence

ARDF no.: CR113

Latitude: 55.3161 **Quadrangle:** CR B-3

Longitude: 132.7845

Location description and accuracy:
This occurrence is probably about 0.2 mile northeast of hill 2337 and about 0.6 mile north-northwest of the center of section 3, T. 76 S., R. 83 E. The location is accurate to within 0.2 mile.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:
The occurrence consists of calcareous greenstone that contains pyrite and minor chalcopyrite (Clark and others,1970 [OF 417]). The greenstone is probably part of the Wales Group of Cambrian and older age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Unknown, other than that the deposit is in rocks of Cambrian or older age.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only sampling by government geologists.

Production notes:

Reserves:

Additional comments:

References:
Clark and others, 1970 (OF 417); Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Clark and others, 1970 (OF 417)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (southeast of head of Twelvemile Arm)

Site type: Occurrence

ARDF no.: CR114

Latitude: 55.3081 **Quadrangle:** CR B-3

Longitude: 132.6823

Location description and accuracy:

This occurrence is locality 3 of Herreid and Rose (1966). It is about 3.5 miles southeast of the head of Twelvemile Arm, and about 0.3 mile west of the center of section 5, T. 76 S., R. 84 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals: Quartz

Geologic description:

This occurrence is a planar quartz vein about 1 inch thick that contains chalcopyrite (Herreid and Rose, 1966). The vein cuts highly deformed amygdaloidal greenstone marked by ptygmatically-folded quartz-calcite veins. The rocks in the vicinity are greenstone, greenschist, and minor calcareous metagraywacke; they are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). A few hundred yards to the west, Herbert and Race (1964) found chalcopyrite in limestone; a sample contained 0.3 percent copper.

Alteration:

Age of mineralization:

Unknown other than that the mineralization is in rocks of Cambrian or older age.

Deposit model:

Chalcopyrite in quartz vein in greenstone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

Production notes:

Reserves:

Additional comments:

This occurrence is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Herbert and Race, 1964; Herreid and Rose, 1966; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Herreid and Rose, 1966

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Natzuhini Bay)

Site type: Occurrences

ARDF no.: CR115

Latitude: 55.2899 **Quadrangle:** CR B-3

Longitude: 132.8119

Location description and accuracy:
This occurrence is in a borrow pit about 0.8 mile northeast of the head of Natzuhini Bay. It is about 0.5 mile southwest of the center of section 9, T. 76 S., R. 83 E.

Commodities:

Main: Cu

Other:

Ore minerals: Azurite, chalcopyrite, malachite

Gangue minerals:

Geologic description:
At this site, two samples from an outcrop in a borrow pit contained 1,034 and 3,813 parts per million copper (Hedderly-Smith, 1999 [Inventory]). The rocks in the pit consist of chlorite-sericite schist with disseminated pyrite and chalcopyrite; they are part of the Wales Group of Cambrian and older age. Hedderly-Smith also cites a report from workers at a nearby logging camp of a 'copper vein' on a road about 1,200 feet or more to the south. The vein is said to be 4 to 6 inches thick and stained with malachite and azurite.

Alteration:

Age of mineralization:
Unknown other than that the occurrence is in rocks of the Wales Group of Late Proterozoic and Cambrian age.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:
Only sampling in a borrow pit.

Production notes:

Reserves:

Additional comments:
These occurrences are on land that has been conveyed to the Sealaska Corporation who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Hedderly-Smith, 1990; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Burke and Lange

Site type: Prospect

ARDF no.: CR116

Latitude: 55.4890 **Quadrangle:** CR B-2

Longitude: 132.6466

Location description and accuracy:
The Burke and Lange prospect is about 0.4 mile north of Hollis and about 0.5 mile north-northeast of the center of section 4, T. 74 S., R. 84 E. However, there is no report of anyone seeing it since Chapin (1918), and the location may not be accurate.

Commodities:

Main: Au?

Other:

Ore minerals:

Gangue minerals: Quartz

Geologic description:
At this prospect, Chapin (1918) reports a quartz vein about 20 feet wide that strikes N70W, parallel to the layering in greenstone tuff of Silurian or Ordovician age (Herreid and Rose, 1966). The only work was surface stripping.

Alteration:

Age of mineralization:
Unknown, other than that the prospect is in Silurian or Ordovician rocks.

Deposit model:
Quartz vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only surface stripping in about 1916.

Production notes:

Reserves:

Additional comments:

References:
Chapin, 1918; Herreid and Rose, 1966; Cobb, 1978.

Primary reference: Chapin, 1918

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of upper Kina Cove)

Site type: Occurrences

ARDF no.: CR117

Latitude: 55.4930 **Quadrangle:** CR B-2

Longitude: 132.5329

Location description and accuracy:

Sainsbury (1961) reported a mineral occurrence near a logging road on the west side of Kina Cove. Hedderly-Smith (1999 [Inventory]) locates this or another nearby occurrence west of the head of Kina Cove, in the SW1/4 section 32, T. 73 S., R. 85 E. The Hedderly-Smith location is used for this record.

Commodities:

Main: Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

Sainsbury (1961) reported about 2 percent chalcopyrite in recrystallized limestone in a stream bed on the west side of Kina Cove, and as much as 5 percent chalcopyrite in a knob of recrystallized limestone on the shoreline of the cove. The limestone is probably part of the Descon Formation of Silurian and Ordovician age. At or near this location, Hedderly-Smith (1999 [Inventory]) found a 12-inch-thick quartz-pyrite vein in an altered zone in greenstone. A sample contained 904 parts per million (ppm) copper, 2.14 percent zinc, 3.7 ppm silver, and 910 parts per billion gold.

Alteration:

Greenstone near a quartz vein is altered.

Age of mineralization:

Unknown, other than that the occurrences are in Silurian or Ordovician rocks.

Deposit model:

Chalcopyrite in marble and quartz vein in greenstone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only surface sampling by government and industry geologists.

Production notes:

Reserves:

Additional comments:

References:
Sainsbury, 1961; Cobb, 1978; Maas and others, 1995; Hedderly-Smith, 1999 (Inventory).

Primary reference: Sainsbury, 1961; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Shelton

Site type: Prospect

ARDF no.: CR118

Latitude: 55.4332 **Quadrangle:** CR B-2

Longitude: 132.6409

Location description and accuracy:
The Shelton prospect is about 3.4 miles south of Hollis at an elevation of about 1,000 feet. It is about 0.1 mile north of the southwest corner of section 22, T. 74 S., R. 84 E.

Commodities:

Main: Ag, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:
A quartz-calcite vein about 6 feet thick cuts fractured marble associated with schist and phyllite that are part of the Descon Formation of Silurian and Ordovician age (Wright and Wright, 1908; Twenhofel and others, 1949; Eberlein and others, 1983; Brew, 1996). The vein strikes N20E and dips 65 SE, and contains 1 to 2 percent pyrite and chalcopyrite. A 6-foot sample across the vein contained 0.25 percent copper. The prospect was explored by a short drift and a 55-foot winze. Maas and others (1991) were not able to find the workings but did find mining debris near the reported site of the prospect. Their samples of quartz in rubble contained 11.8 to 12.3 parts per million silver and 1.8 to 1.92 percent copper.

Alteration:

Age of mineralization:
Unknown, other than that the vein cuts Silurian or Ordovician marble.

Deposit model:
Quartz-calcite vein with pyrite and chalcopyrite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
The prospect was explored by a short drift and a 55-foot winze prior to 1908.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1906; Wright and Wright, 1908; Twenhofel and others, 1949; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Twenhofel and others, 1949

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hatchet

Site type: Prospect

ARDF no.: CR119

Latitude: 55.4393 **Quadrangle:** CR B-2

Longitude: 132.4314

Location description and accuracy:

The only published location for this old prospect is a small-scale map and the description by Brooks (1902). He places it about a half mile north of the shore of Polk Inlet at an elevation of about 300 feet. There is a small island on his map in section 25, T. 74 S., R. 85 E. that can be identified on the modern 1:63,360-scale topographic map. The prospect is north of the island, probably within 1/4 mile of the center of the W1/2 section 24, T. 74 S., R. 85 E.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz?

Geologic description:

The only description of this prospect is by Brooks (1902). The rocks in the vicinity include black, carbonaceous, pyritiferous slate that strikes N60W and dips 50NE. The rocks are part of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). A small cut exposes a (quartz?) vein up to 4 inches thick in crumpled slate. The vein contains pyrite and less than $1 per ton in gold (at $20.67 per ounce).

Alteration:

Slate is crumpled near the vein.

Age of mineralization:

Unknown, other than that the vein is in Silurian or Ordovician slate.

Deposit model:

Quartz(?) vein with low gold values.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

Only a small cut.

Production notes:

Reserves:

Additional comments:

The Sealaska Corporation holds the subsurface rights to the land in the vicinity of this old prospect.

References:

Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on 'Franks Ridge')

Site type: Prospect

ARDF no.: CR120

Latitude: 55.3519 **Quadrangle:** CR B-2

Longitude: 132.5928

Location description and accuracy:
The only published location for this prospect is a small-scale map of Maas and others (1991). There is a group of claims staked at the site, and apparently considerable exploration, including drilling, was done on the ridge east of the headwaters of Old Franks Creek. Somewhat arbitrarily, the site is plotted at the high point of the ridge--which is locally called Franks Ridge--about 0.3 mile east of the center of section 23, T. 75 S., R. 84 E. The exploration may extend for a mile or more from this location.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals:

Gangue minerals:

Geologic description:
Maas and others (1991) indicate that volcanogenic, massive-sulfide mineralization was found in 1981 along the prominent ridge east of the headwaters of Old Franks Creek. The area was explored by Exxon Minerals Corporation, who staked a group of claims and did extensive work, including drilling. Maas and others (1991) collected 5 samples in the area. The best contained 0.14 parts per million (ppm) gold, 1.6 ppm silver, and 703 ppm copper; most had negligible metal values. As mapped by Eberlein and others (1983), the rocks in the area are basaltic and andesitic volcanic rocks of the Descon Formation of Silurian and Ordovician age.

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Exxon Minerals Corporation staked a group of claims in 1981 and did extensive work, including drilling.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Deer Bay)

Site type: Prospect

ARDF no.: CR121

Latitude: 55.2657 **Quadrangle:** CR B-2

Longitude: 132.6667

Location description and accuracy:
This prospect is near the shoreline of upper Hetta Inlet about 0.4 mile west of Dell Island. It is in the NE1/4 section 20, T. 76 S., R. 84 E. Informally, it is sometimes called the 'Deer Island exhalite' (e.g., Hedderly-Smith, 1999 [Inventory]), although it is about 2 miles north of the mouth of Deer Bay and there is no nearby Deer Island on the USGS topographic maps. The mineralization is exposed along a logging road parallel to the shoreline at an elevation of about 100 feet.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
This prospect was identified as a massive sulfide deposit by Sealaska geologists in 1988, and mapped and sampled by the American Copper and Nickel Company in 1991 and 1993 (Maas and others, 1995; Hedderly-Smith, 1999 [Inventory]). There is a short adit near the shoreline that indicates earlier work not described in the literature.
The rocks in the vicinity consist of quartz-sericite-chlorite schist and metabasalt of the Wales Group of Late Proterozoic and Cambrian age that are cut by rhyodacite porphyry and diabase dikes and sills (Herreid and others, 1978; Maas and others, 1995; Hedderly-Smith, 1999 [Inventory]). The metamorphic rocks strike northeast and dip northwest. The deposit consists of a stratabound, exhalite zone up to 35 feet thick with pyrite, chalcopyrite, and sphalerite; the zone can be traced for about 1,100 feet along strike. The average value of a set of samples across the zone was 2,345 parts per million (ppm) copper, 2,263 ppm zinc, 5.7 ppm silver, and 309 parts per billion gold (Hedderly-Smith, 1999 [Inventory]).

Alteration:

Age of mineralization:

Deposit model:
Kuroko massive sulfide (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: None

Site Status: Active?

Workings/exploration:

Sampling of mineralization in outcrops along a logging road in the late 1990's, as well as geologic mapping and geochemical sampling. A short adit nearby was probably driven in the early 1900's.

Production notes:

Reserves:

Additional comments:
This prospect is on land that has been conveyed to the Sealaska Corporation or is under application for transfer to them.

References:
Herreid and others, 1978; Hedderly-Smith, 1989; Hedderly-Smith, 1990; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Maas and others, 1992; Maas and others, 1995; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Campbell

Site type: Prospect

ARDF no.: CR122

Latitude: 55.2631

Quadrangle: CR B-2

Longitude: 132.6436

Location description and accuracy:

The Campbell prospect is about 1.4 mile northwest of Mount Jumbo and about 0.3 mile east-southeast of the center of section 21, T. 76 S., R. 84 E.

Commodities:

Main: Ag, Cu, Zn

Other: Au, Pb

Ore minerals: Chalcopyrite, pyrrhotite

Gangue minerals:

Geologic description:

The Campbell prospect is in skarn near the contact of a small Cretaceous granodiorite stock that intrudes marble of the Wales Group of Late Proterozoic and Cambrian age (Herreid and others, 1978). The deposit consists of small, pyrrhotite-rich pods with chalcopyrite in the skarn. One sample contained 1,380 parts per million (ppm) copper, 20 ppm lead, 175 ppm zinc, 1.5 ppm silver, and a trace of gold. The prospect was explored by a 50-foot adit.

Alteration:

Deposit probably is genetically related to the skarn host rock.

Age of mineralization:

Probably related to a nearby Cretaceous granodiorite intrusion.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b

Production Status: None

Site Status: Undetermined

Workings/exploration:

The only working consists of a 50-foot adit.

Production notes:

Reserves:

Additional comments:

The Campbell prospect is on or surrounded by lands that have been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Herreid and others, 1978; Maas and others, 1995.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Houghton

Site type: Prospect

ARDF no.: CR123

Latitude: 55.2637 **Quadrangle:** CR B-2

Longitude: 132.6215

Location description and accuracy:
The Houghton prospect is about 0.8 mile north-northwest of Mount Jumbo. It is at an elevation of about 1,650 feet, about 0.3 mile east-southeast of the center of section 22, T. 76 S., R. 84 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, copper, magnetite, pyrite, pyrrhotite, sphalerite

Gangue minerals: Epidote, garnet

Geologic description:
The Houghton is an old prospect that was discovered between 1900 and 1903 and was explored by several adits and surface workings prior to 1908 (Wright and Wright, 1905; Wright, 1915; Roppel, 1991). There has been little work since.
The deposit consists of small, irregular pods of sulfides in garnet-epidote skarn. The skarn is about 65 feet thick and extends for several hundred feet along a faulted contact between Cretaceous granodiorite and marble of the Wales Group of Late Proterozoic or Cambrian age (Wright and Wright, 1908; Herreid and others, 1978; Maas and others, 1991, 1995). The ore minerals are mainly chalcopyrite, magnetite, and pyrite, with minor sphalerite, pyrrhotite, and native copper. Samples collected by Maas and others (1991, 1995) in the adits contained up to 2,630 parts per billion gold, 465 parts per million silver, and 10.44 percent copper, but the mineralization is restricted to small pods.

Alteration:
Mineralization associated with garnet-epidote skarn.

Age of mineralization:
Related to nearby Cretaceous granodiorite.

Deposit model:
Cu-Fe skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status:

Workings/exploration:
The prospect was explored by three adits, 80, 100, and 200 feet long, and several surface trenches, mostly before 1908; and an aerial tram extended to down to Hetta Inlet. The property has been inactive since the

1920's.

Production notes:

Reserves:

Additional comments:

The Houghton prospect is on or surrounded by land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Wright and Wright, 1905; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Wright, 1915; Herreid and others, 1978; Cobb, 1978; Maas and others, 1991; Roppel, 1991; Maas and others, 1995.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gould

Site type: Prospect

ARDF no.: CR124

Latitude: 55.2771 **Quadrangle:** CR B-2

Longitude: 132.6172

Location description and accuracy:
The Gould prospect is near the southwest tip of Gould Island, about 0.4 mile north-northwest of the southeast corner of section 15, T. 76 S., R. 84 E.

Commodities:

Main: Ag, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, malachite, pyrite, sphalerite

Gangue minerals: Albite, epidote, garnet, quartz, wollastonite

Geologic description:
The rocks in the vicinity of the Gould prospect are mainly marble of the Wales Group of Cambrian or older age, and skarn composed of albite, epidote, garnet and wollastonite (Eberlein and others, 1983; Brew, 1996). A large body of Cretaceous, epidotized gabbro and diorite, which makes up most of Gould Island, is just east of the prospect (Wright and Wright, 1915; Herreid and others, 1978; Maas and others, 1991). There are two types of deposits: 1) chalcopyrite, galena, and sphalerite occur in veinlets in hornfels, and 2) a 4-foot quartz vein contains abundant chalcopyrite, with pyrite and malachite. The prospect has been sampled several times in recent years. A sample of the vein collected by Herreid and others (1978) contained 3.0 ounces of silver per ton, 0.91 percent copper, 140 parts per million (ppm) lead, and 0.21 percent zinc. Several samples of dump material collected by Maas and others (1991) contained up to 3.7 ppm silver, 1.4 percent copper, and 1.8 percent zinc. A chip sample across the quartz vein contained 802 parts per billion gold, 6.7 ppm silver, 1.74 percent copper, and 1.39 percent zinc. Several high-grade samples collected by Hedderly-Smith (1999 [Inventory]) contained 2,156 ppm copper, 2.3 percent lead, more than 10 percent zinc, and 19.9 ppm silver. All of the workings probably date to before World War I; they include a 70-foot adit, a 10-foot shaft, and several trenches and prospect pits.

Alteration:
Marble is altered to albite-epidote-garnet-wollastonite skarn.

Age of mineralization:
Probably related to a nearby Cretaceous intrusion.

Deposit model:
Ag-Pb-Zn skarn and polymetallic vein (Cox and Singer, 1986; models 18c and 22c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18c, 22c

Production Status: None

Site Status: Undetermined

Workings/exploration:

All of the workings probably date to before World War I; they include a 70-foot adit, a 10-foot shaft, and several trenches and prospect pits.

Production notes:

Reserves:

Additional comments:

The Gould prospect is on or surrounded by land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Wright, 1908; Wright and Wright, 1908; Wright, 1915; Herreid and others, 1978; Cobb, 1978; Eberlein and others, 1983; Glavinovich, 1987; Hedderly-Smith, 1991 (1990 season); Maas and others, 1991; Hedderly-Smith, 1992 (1991 season); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Mount Jumbo); Hedderly-Smith, 1999 (Inventory).

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Sultana; Beaver

Site type: Prospects

ARDF no.: CR125

Latitude: 55.2908 **Quadrangle:** CR B-2

Longitude: 132.5948

Location description and accuracy:

The Sultana Group consists of several prospects spread over 6 claims. The group is centered about 1.0 mile east of the abandoned town of Sulzer and about 0.4 mile southeast of the center of section 11, T. 76 S., R. 84 E. Several additional occurrences near the prospects are included in this record. Herreid and others (1978) place the Sultana prospect about 0.6 mile east of this site, but they apparently did not visit it and the original location of Wright and Wright (1908) used in this record is probably more accurate.

Commodities:

Main: Ag, Au, Cu, Fe, Mo, Zn

Other:

Ore minerals: Chalcopyrite, magnetite, pyrrhotite

Gangue minerals: Epidote, garnet, hornblende

Geologic description:

The Sultana Group consists of several prospects spread over 6 claims. There are two adits, one 130 feet long, and several trenches and propect pits. A large Cretaceous granitic pluton is exposed east of the prospects; it intrudes schist and marble of the Late Proterozoic and Cambrian Wales Group (Eberlein and others, 1983; Herreid and others, 1978). Herreid and others (1978) mapped a band of albite-epidote and garnet-hornblende hornfels for about a mile along the shoreline just south of this site.

According to Wright and Wright (1908), the mineralization consists of contact-metamorphic deposits in a cap of siliceous limestone over a granitic pluton. Garnet and epidote with disseminations and small masses of chalcopyrite, magnetite, and pyrrhotite occur at the contact between the metamorphosed limestone and the granitic rocks. In one adit, a mass of chalcopyrite-rich ore, 3 feet wide, is exposed near the portal; the workings then continue through 25 feet of barren garnet-epidote rock. Samples with pyrrhotite were originally thought to contain cobalt and nickel, but analyses showed only a trace of cobalt and less than 0.2 percent nickel. Maas and others (1995) collected four rock samples that contained up to 1,201 parts per million (ppm) copper, 5 ppm lead, 54 ppm zinc, 1.0 ppm silver, and 6 parts per billion (ppb) gold.

Hedderly-Smith (1999 [Inventory]) describes several nearby mineral occurrences similar to the Sultana deposits. Several skarn outcrops with pyrrhotite, pyrite, and chalcopyrite in section13 contained up to 1,824 ppm copper and 2.0 ppm silver. A sample from a 1- to 3-foot-thick, pyrite-bearing silicified zone in schist south of the Sultana claims contained 1,058 ppm copper. A sample of black graphitic schist in the NW1/4 of section 11 contained 29 ppm molybdenum, 10.3 ppm silver, and 95 ppm arsenic.

Alteration:

Extensive development of skarn at contact of Cretaceous granitic intrusion.

Age of mineralization:

Probably related to the nearby Cretaceous granitic intrusion.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings on the Sultana Group include at least two short adits at elevations of about 350 to 600 feet, and several trenches and pits scattered over at least 6 claims. There apparently has been no activity since at least 1908.

Production notes:

Reserves:

Additional comments:
This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Brooks, 1902; Wright, 1908; Wright and Wright, 1908; Wright, 1915; Cobb, 1978; Eberlein and others, 1983; Herreid and others, 1978; Glavinovich, 1987; Hedderly-Smith, 1992 (1991 season); Maas and others, 1992; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1997 (Mount Jumbo); Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908; Hedderly-Smith, 1999

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north of Gould Island)

Site type: Prospect

ARDF no.: CR126

Latitude: 55.3040 **Quadrangle:** CR B-2

Longitude: 132.6004

Location description and accuracy:

This prospect is at an elevation of about 2,200 feet, just above timberline. It is about 1.3 mile northeast of the abandoned town of Sulzer and about 0.4 mile south-southeast of the center of section 2, T. 76 S., R. 84 E.

Commodities:

Main: Ag, Cu, Pb, Zn

Other: Ba, Sb

Ore minerals: Galena, sphalerite

Gangue minerals: Calcite

Geologic description:

This prospect was first described by Chapin (1918) but apparently has had little attention since. It consists of several small but prominent prospect pits in massive marble of the Wales Group of Late Proterozoic and Cambrian age (D.J. Grybeck, unpublished field notes and analyses, 1984). The dumps contain abundant material with nearly massive sphalerite and galena, and bright-orange gossan. There is minor copper staining and considerable oxidization of the sulfides to secondary lead and zinc minerals. The prospect pits extend for a length of about 300 feet over a vertical range of about 100 feet. Selected sulfide-rich samples contained 20-700 parts per million (ppm) silver, 2,000 to more than 5,000 ppm barium, 500-10,000 ppm copper, and 150-1,500 ppm antimony, as well as major lead and zinc that reflect the galena and sphalerite. The ore minerals are probably a replacement deposit in marble.

Alteration:

Age of mineralization:

Unknown, other than that the deposit is in Cambrian or older marble.

Deposit model:

Ag-Pb-Zn replacement in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Several prospect pits over a length of about 300 feet.

Production notes:

Reserves:

Additional comments:

This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Chapin, 1918; Cobb, 1978; Glavinovich, 1987; Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1997 (Mount Jumbo); Hedderly-Smith, 1999 (Inventory).

Primary reference: This record

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Earl No. 1

Site type: Prospect

ARDF no.: CR127

Latitude: 55.2579 **Quadrangle:** CR B-2

Longitude: 132.4792

Location description and accuracy:

This old claim is about one-half mile west of the head of the West Arm of Cholmondeley Sound. The exact location is vague; for this record, it is arbitrarily plotted about 0.6 mile south-southwest of the center of section 22, T. 76 S., R. 85 E. This location is probably accurate to within 0.5 mile.

Commodities:

Main:

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:

The only published description of the deposit at this prospect is by Brooks (1902), who describes it as 'disseminated quartz blebs which carry iron pyrite' in quartz schist associated with graphitic phyllite. There were no assays. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status: Probably inactive

Workings/exploration:

None noted, other than that a claim was staked before 1902.

Production notes:

Reserves:

Additional comments:

The Sealaska Corporation has the subsurface rights to the land in the vicinity of this old prospect.

References:

Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Bertha; Hecla; Red Rose

Site type: Prospects

ARDF no.: CR128

Latitude: 55.2906 **Quadrangle:** CR B-2

Longitude: 132.4008

Location description and accuracy:

The only primary reference to these claims is by Brooks (1902), who says that they are about 0.8 mile southwest of the Khayyam Mine (CR129). For this record, the site is in the SW1/4 section 7, T. 76 S., R. 86 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrrhotite

Gangue minerals:

Geologic description:

Brooks (1902), who did not visit these claims, asserts that the deposits are identical to those at the Khayyam Mine (CR129). He describes them as three parallel veins with chalcopyrite and pyrrhotite. No deposits have since been mentioned at or near these claims. Barrie (1984), who studied the nearby Khayyam Mine, also mapped the likely area of these claims, but apparently did not identify any mineral deposits there. Barrie mapped the rocks in the vicinity as felsic to mafic schist, mostly of volcanic origin, that is part of the Late Proterozoic and Cambrian Wales Group.

Alteration:

Age of mineralization:

There is no modern confirmation of a deposit on these claims. If one exists, it is probably similar to the Late Proterozoic or Cambrian deposit at the nearby Khayyam Mine (CR129).

Deposit model:

Besshi massive-sulfide deposit? (Cox and Singer, 1986; 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b?

Production Status: None

Site Status: Probably inactive

Workings/exploration:

No indication of work beyond claims staked prior to 1902. Claims staked intermittently on the Khayyam Mine over the years may have extended to this site.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Barrie, 1984; Barrie and Kyle, 1988.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Khayyam; Kiam

Site type: Mine

ARDF no.: CR129

Latitude: 55.2960 **Quadrangle:** CR B-2

Longitude: 132.3929

Location description and accuracy:

The Khayyam Mine is incorrectly located on the USGS 1:63,360-scale topographic map. It is in fact at an elevation of about 2,500 feet, about 0.3 mile southwest of the mine symbol on the topographic map and about 0.3 mile east-northeast of the center of section 7, T. 76 S., R. 86 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other: Pb

Ore minerals: Chalcopyrite, copper, gahnite, magnetite, pyrite, pyrrhotite, sphalerite

Gangue minerals:

Geologic description:

The first claims were staked on the deposit at the Khayyam Mine in 1898 and most of the development work took place between 1901 and 1907 (Brooks, 1902; Wright and Wright, 1908; Roppel, 1991; Maas and others, 1995). The mine has 8 adits with a total of about 1,800 feet of underground workings, and numerous pits, trenches, and open cuts. The mine was serviced by aerial and surface trams that connected to the head of McKenzie Inlet. The mine produced 177,769 pounds of copper, 1,711 ounces of silver, and 129 ounces of gold in 1907.

Recent detailed mapping (Barrie, 1984; Barrie and Kyle, 1988) indicate that the deposits at the Khayyam Mine are stratiform, massive-sulfide lenses in Late Proterozoic or Cambrian metamorphic rocks of the Wales Group. The host rocks are mainly schist of volcanic origin. The main units are: felsic plagioclase-quartz-chlorite-biotite schist; intermediate (hornblende-quartz-)chlorite-plagioclase schist; and mafic (chlorite-)hornblende-plagioclase schist. The rocks consistently strike about N75W and dip steeply to the north and south. Minor amounts of garnet, sericite, stilpnomelane, and epidote are possibly related to hydrothermal alteration from a nearby Cretaceous diorite intrusion.

The deposit consists of at least 6 massive sulfide lenses in a 200-foot- thick layer of mafic and intermediate schist that grades laterally into felsic schist. Individual massive-sulfide lenses are up to 22 feet thick and can be traced for up to 230 feet along strike. The lenses consist of 50-95 percent pyrite with varying amounts of chalcopyrite, sphalerite, and pyrrhotite. Gahnite occurs in the schist near the massive sulfide layers. Copper, gold, and silver are distributed irregularly through the deposit; zinc is enriched at the periphery. The deposit is associated with coarse, fragmental volcanic rocks that were at or near hydrothermal, submarine vents. The ore lenses characteristically have chloritic alteration in their footwall, and the mafic and intermediate schist is silicified near the vents. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age.

The deposit was extensively sampled by the U.S. Bureau of Mines in 1944 and 1945 (Fosse, 1946). They defined an inferred resource of 84,000 tons of material that contains 1.71 percent copper, 0.93 percent zinc, 0.06 ounce of gold per ton, and 0.30 ounce of silver per ton. Banner Mining Company drilled 14 holes in 1971 at the Khayyam Mine and 11 holes at the Mammoth (Stumble-On) prospect (CR130). Cominco Exploration mapped and sampled the property in 1972 and 1973. Homestake Mining Company examined the property in 1975 (Hite, 1976). More recently, the deposit was sampled by the U.S. Bureau of Mines (Maas and others, 1995), who collected 41 samples. Their best values were 2.14 ppm gold, 43.7 ppm silver, 9.5

percent copper, 1.66 percent zinc, and minor lead; most values were much lower.

Alteration:
The ore lenses characteristically have chloritic alteration in their footwall, and the mafic and intermediate schist is silicified near the vents.

Age of mineralization:
Massive sulfide deposit in Late Proterozoic or Cambrian metamorphic rocks.

Deposit model:
Besshi massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
24b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The first claims were staked on the deposit at the Khayyam Mine in 1898 and most of the development work took place between 1901 and 1907 (Brooks, 1902; Wright and Wright, 1908; Roppel, 1991; Maas and others, 1995). The mine has 8 adits with a total of about 1,800 feet of underground workings, and numerous pits, trenches, and open cuts. The mine was serviced by aerial and surface trams that connected to the head of McKenzie Inlet. The deposit was extensively sampled by the U.S. Bureau of Mines in 1944 and 1945 (Fosse, 1946). Banner Mining Company drilled 14 holes in 1971 at the Khayyam Mine and 11 holes at the Mammoth (Stumble-On) prospect (CR130). Cominco Exploration mapped and sampled the property in 1972 and 1973. Homestake Mining Company examined the property in 1975 (Hite, 1976). More recently, the deposit was sampled by the U.S. Bureau of Mines (Maas and others, 1995).

Production notes:
The mine produced 177,769 pounds of copper, 1,711 ounces of silver, and 129 ounces of gold in 1907.

Reserves:
The U.S. Bureau of Mines defined an inferred resource of 84,000 tons of material that contains 1.71 percent copper, 0.93 percent zinc, 0.06 ounce of gold per ton, and 0.30 ounce of silver per ton (Fosse, 1946).

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Buddington and Chapin, 1929; Fosse, 1946; Bufvers, 1967; Hite, 1976; Barrie, 1984; Barrie and Kyle, 1988; Maas and others, 1991; Roppel, 1991; Maas and others, 1992; Maas and others, 1995; Slack and others, 2002.

Primary reference: Barrie and Kyle, 1988

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Stumble-on; Mammoth

Site type: Prospect

ARDF no.: CR130

Latitude: 55.2967 **Quadrangle:** CR B-2

Longitude: 132.3720

Location description and accuracy:

The Stumble-on prospect is at an elevation of about 1,300 feet, 0.8 mile east-southeast of the mine symbol for the Khayyam Mine on the USGS, 1:63,360 scale topographic map. (The Khayyam Mine is not at the symbol; see CR129 for its actual location.) The Stumble-on prospect is about 0.2 mile north-northeast of the center of section 8, T. 76 S., R. 86 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, copper, gahnite, magnetite, pyrite, pyrrhotite, sphalerite

Gangue minerals:

Geologic description:

The deposit at the Stumble-on Mine was discovered in about 1899, probably at the same time as the nearby Khayyam Mine (CR129) (Brooks, 1902; Wright and Wright, 1908; Fosse, 1946; Bufvers, 1967; Barrie, 1984; Barrie and Kyle, 1988; Roppel, 1991; Maas and others, 1995). The Stumble-on, first called Mammoth, was developed by 2 adits with about 530 feet of workings, an open cut, and several trenches. There is no record of production.

Detailed mapping (Barrie, 1984; Barrie and Kyle, 1988) indicates that the deposit at the Stumble-on prospect is a stratiform, massive-sulfide lens in Late Proterozoic or Cambrian metamorphic rocks of the Wales Group. The host rocks consist mainly of schist of volcanic origin. The main units are (hornblende-quartz-) chlorite-plagioclase schist and (chlorite-)hornblende-plagioclase schist. The rocks consistently strike about N75W and dip steeply to the north and south. Minor amounts of garnet, sericite, stilpnomelane, and epidote also occur in the schist. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age.

The deposit at the Stumble-on prospect consists of a single, massive-sulfide lens about 6 feet thick that is exposed for about 560 feet (Barrie, 1984; Barrie and Kyle, 1984; Maas and others, 1995). The lens consists mainly of pyrite with subordinate chalcopyrite, pyrrhotite, and magnetite. A ground geophysical survey (VLF-EM) indicates that the body continues to the east under surficial material. The deposit is essentially the same as the one at the nearby Khayyam Mine (CR129), and much of the geologic and exploration work there probably extends to the area of the Stumble-on prospect. Bedrock between the two deposits is largely covered by surficial material, but they may be part of the same stratigraphic horizon. The Stumble-on prospect has been sampled many times with similar results that vary mostly by the sample selection. Maas and others (1995), for example, sampled extensively. Their highest values were 5.96 percent copper, 3.61 percent zinc, 43.7 parts per million (ppm) silver, and 3.916 ppm gold; the average value of their 24 samples was 0.92 percent copper, 0.20 percent zinc, 691 ppm silver, and 1.12 ppm gold.

Alteration:

Probably similar to that at the Khayyam Mine (CR129).

Age of mineralization:

Volcanogenic, massive sulfide deposit in Late Proterozoic or Cambrian metamorphic rocks.

Deposit model:
Besshi massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
24b

Production Status: None

Site Status: Active?

Workings/exploration:
The Stumble-on prospect was developed by 2 adits with about 530 feet of workings, an open cut, and several trenches. Banner Mining Company drilled 14 holes in 1971 at the Khayyam Mine and 11 holes at the Mammoth (Stumble-On) prospect (CR130). Cominco Exploration mapped and sampled the property in 1972 and 1973. Homestake Mining Company examined the property in 1975 (Hite, 1976). More recently, the deposit was sampled by the U.S. Bureau of Mines (Maas and others, 1995).

Production notes:
There is no record of production.

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Buddington and Chapin, 1929; Fosse, 1946; Bufvers, 1967; Hite, 1976; Barrie, 1984; Barrie and Kyle, 1988; Maas and others, 1991; Roppel, 1991; Maas and others, 1992; Maas and others, 1995; Slack and others, 2002.

Primary reference: Barrie and Kyle, 1988

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lucky Monday

Site type: Prospect

ARDF no.: CR131

Latitude: 55.3376 **Quadrangle:** CR B-2

Longitude: 132.3971

Location description and accuracy:

The Lucky Monday prospect is about 0.2 mile east of the center of section 30, T. 75 S., R. 86 E. It is about 0. 3 mile east of the outlet of the small lake in the west half of that section.

Commodities:

Main: Ag, Au, Cu, Mo, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals:

Geologic description:

This prospect was found by Noranda Exploration, Inc. in 1978 (Maas and others 1991). The rocks in the area consist of a heterogeneous series of metavolcanic rocks, generally of rhyolite to latite composition, that are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

The host rocks of the deposit are white to cream, metarhyolite that weathers orange and contains 1 to 2 percent pyrite. The best mineralization occurs at the base of a small waterfall, where several irregular layers and lenses of massive sulfides up to 5 inches thick are interbedded in the metarhyolite (D.J. Grybeck, unpublished field notes, 1985). The layers are mainly pyrite and sphalerite with minor chalcopyrite and galena. Selected samples of the massive sulfide layers contained 100 to 150 parts per million (ppm) silver, 0.2 to 1 percent copper, 20 to 50 ppm molybdenum, major zinc and lead, and 0.15 to 0.60 ppm gold. Similar rhyolite with thin massive sulfide lenses reportedly extends to the northwest at least as far as Polk Inlet, but the Lucky Monday deposit reportedly is the best mineralization found by industry in the area (William Block, oral communication, 1985). Maas and others (1991) collected 29 samples at or near this prospect; the best contained 51 parts per billion gold, 1.3 ppm silver, 171 ppm copper, 258 ppm lead, and 443 ppm zinc.

Alteration:

Age of mineralization:

Deposit probably formed during the deposition of its Late Proterozoic or Cambrian host rocks.

Deposit model:

Kuroko massive sulfide (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

28a

Production Status: None

Site Status: Undetermined

Workings/exploration:
A few prospect pits and other surface sampling of outcrops of mineralization.

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: This report

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Anderson (near McKenzie Inlet)

Site type: Prospect

ARDF no.: CR132

Latitude: 55.3283 **Quadrangle:** CR B-2

Longitude: 132.3667

Location description and accuracy:
The only description of this prospect is by Brooks (1902), who located it 'about 100 yards west of the lower end of McKenzie Inlet.' For this record, it is about 0.5 mile northeast of the center of section 32, T. 75 S., R. 86 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals:

Geologic description:
The only published description of this prospect is by Brooks (1902). He describes it as a tunnel in chloritic schist that exposes a 3-foot-wide zone with chalcopyrite. The rocks in the area are greenstone, schist , phyllite, and minor marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Unknown, other than that the prospect is in Late Proterozoic or Cambrian host rocks.

Deposit model:
Insufficient information.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
A short tunnel was driven before 1902.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Big Six

Site type: Prospect

ARDF no.: CR133

Latitude: 55.4675 **Quadrangle:** CR B-1

Longitude: 132.1832

Location description and accuracy:
The Big Six prospect is at an elevation of about 1,200 feet, about 1.2 mile north-northwest of triangulation station Ren near the southeast tip of the Kasaan Peninsula. The prospect is about 0.5 mile west of the center of section 10, T. 74 S., R. 87 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, copper, pyrite

Gangue minerals: Calcite

Geologic description:
The Big Six is an old prospect that was first described by Brooks in 1902 and has only been mentioned in secondary sources since. Chalcopyrite and pyrite occur in an altered zone in limestone near its contact with greenstone. Native copper occurs along joints. Workings consist of a few open cuts. Brooks' location is presumably reliable, but recent mapping in the area by by Eberlein and others (1983) shows only a large Ordovician and Silurian diorite pluton at the south end of the Kasaan Peninsula.

Alteration:
Limestone hostrock is altered.

Age of mineralization:

Deposit model:
Chalcopyrite in altered zone in limestone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Open cuts.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1995.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Cachelot

Site type: Prospect

ARDF no.: CR134

Latitude: 55.4671 **Quadrangle:** CR B-1

Longitude: 132.1544

Location description and accuracy:
The only primary description of this prospect is by Brooks (1902), who locates it about a mile north of Grindall Point and about 0.3 mile west of the center of section 11, T. 74 S., R. 87 E. The 1993 edition of the USGS 1:63,360-scale topographic map shows an unnamed prospect at this location.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals: Quartz

Geologic description:
This old prospect consists of a quartz vein about 12 inches thick at the surface that thickens to 3 feet thick at the bottom of an open cut about 10 feet deep (Brooks, 1902). The vein is in sheared diorite with epidote along the shear zones. The vein strikes east and dips 70N. It contains chalcopyrite; a random sample assayed 0.41 ounce of silver per ton and 0.14 ounce of gold per ton. The south end of the Kasaan Peninsula consists of a large pluton of Silurian or Ordovician diorite (Eberlein and others, 1983; Brew, 1996).

Alteration:
Shear zones in diorite adjacent to vein have coatings of epidote.

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Explored by a 10-foot-deep open cut.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Fowlkes

Site type: Prospect

ARDF no.: CR135

Latitude: 55.2669 **Quadrangle:** CR B-1

Longitude: 132.2983

Location description and accuracy:
The location of this old prospect is uncertain. It is probably northwest of Sunny Cove, within a mile or so of the center of section 23, T. 76 S., R. 86 E. This may be the prospect described by Brooks (1902) about two miles to the east (CR136).

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals:

Geologic description:
The only published description of the Fowlkes prospect is by Wright and Wright (1906). Chalcopyrite occurs in a mineralized band about 12 feet wide in schist and gneiss. The prospect was explored by a 95-foot crosscut. There is some surface alteration (oxidation?) of the sulfide ore. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:
Unspecified surface alteration of sulfides (oxidation?).

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
Explored by a 95-foot crosscut.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1906; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1906

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Anderson

Site type: Prospect

ARDF no.: CR136

Latitude: 55.2604 **Quadrangle:** CR B-1

Longitude: 132.2329

Location description and accuracy:
The location of the Anderson prospect as given by Brooks (1902) is unambiguous, although the deposit has hardly been mentioned since. It is east of Sunny Cove and about a mile north of Sunny Point, in the SW1/4 section 20, T. 76 S., R. 87 E.

Commodities:

Main: Cu

Other:

Ore minerals:

Gangue minerals:

Geologic description:
Brooks (1902) described this prospect as a claim said to carry copper values. Nothing else is known about it. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Unknown, other than that the presumed deposit is in Late Proterozoic or Cambrian rocks.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
Apparently none.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Moonshine (on Dall Island)

Site type: Prospect

ARDF no.: CR137

Latitude: 55.1002 **Quadrangle:** CR A-4

Longitude: 133.1163

Location description and accuracy:
The Moonshine prospect is somewhere near the old trail between the head of View Cove and Manhattan Arm. For this record, the site is on the trail about 0.4 mile east of the head of Manhattan Arm, but the prospect may be a mile or more from this location. The only published description of this prospect is by Smith (1914); subsequent efforts to find it have not been successful.

Commodities:

Main: Ag, Pb

Other:

Ore minerals: Galena

Gangue minerals:

Geologic description:
Smith (1914) reported argentiferous galena at this site, but several later attempts to find it have been unsuccessful (D.J. Grybeck, field work, 1969; Maas and others, 1991). The rocks in the area consist of sedimentary rocks of the Descon Formation of Silurian and Ordovician age.(Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Ordovician or Silurian or younger rocks.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
None reported.

Production notes:

Reserves:

Additional comments:
This old prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Smith, 1914; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Smith, 1914

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Yellowstone

Site type: Prospect

ARDF no.: CR138

Latitude: 55.0889 **Quadrangle:** CR A-4

Longitude: 133.1695

Location description and accuracy:
The Yellowstone prospect is at an elevation of about 2,200 feet, about 0.6 mile north of peak 2750 on Thunder Mountain and about 0.3 mile southwest of the center of section 23, T. 78 S., R. 81 E.

Commodities:

Main: Ag, Cu, Zn

Other: Au

Ore minerals: Chalcopyrite, pyrite, pyrrhotite, sphalerite

Gangue minerals:

Geologic description:
The Yellowstone prospect was located prior to 1910 (Knopf, 1910, 1911; Berg and Cobb, 1967) but little work has been done on it since. When examined by D. J. Grybeck (unpublished field notes, 1984) and by Maas and others (1991,1995), the workings were several small, prominent, prospect pits and one short adit. The deposit consists of several small pods of hornfels and skarn in limestone interbedded with chert and argillite. The limestone is cut by several prominent diabase dikes that probably are not related to the mineralization. The hornfels and skarn on the dumps contain abundant chalcopyrite and pyrrhotite; pyrite is also present, and on one dump, sphalerite. Selected samples (D.J. Grybeck, unpublished analyses, 1984) contained up to 30 parts per million (ppm) silver, 2 percent copper, and 1,000 ppm zinc. Samples collected by Maas and others (1991) contained up to 7.89 percent zinc, 1.8 percent copper, and 11 ppm silver. Gold values were barely above the detection level of 5 parts per billion. The prospect is in a thrust plate of Silurian Heceta Limestone that overlies sedimentary rocks of the Descon Formation of Silurian and Devonian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Silurian or younger.

Deposit model:
Ag-Cu-Zn skarn (Cox and Singer, 1986; models 18b or 18c).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b, 18c

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only workings are several small prospect pits and a short adit that date from before 1910.

Production notes:

Reserves:

Additional comments:

References:

Knopf, 1910; Knopf, 1911; Berg and Cobb, 1967; Bufvers, 1967; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Shellhouse; Miller

Site type: Prospects

ARDF no.: CR139

Latitude: 55.0516 **Quadrangle:** CR A-4

Longitude: 133.1047

Location description and accuracy:
The Shellhouse prospect is about 0.8 mile west-northwest of the northwest head of Coco Harbor, and about 0.4 mile northeast of the center of section 6, T. 79 S., R. 82 E. The location is accurate.

Commodities:

Main: Ag, Au, Cu, Mo

Other:

Ore minerals: Chalcopyrite, pyrite, pyrrhotite

Gangue minerals: Actinolite, calcite, chlorite, diopside, garnet, quartz

Geologic description:
The Shellhouse and Miller prospects have been known since before 1909, but the early descriptions say little more than that the deposits consist of bodies of chalcopyrite and pyrrhotite in quartz-calcite gangue in limestone and siliceous schist (Wright, 1909; Chapin, 1918). Maas and others (1991) located several open cuts and an adit in dense vegetation. They describe the deposit as a 4-foot-thick sulfide lens with pyrite, pyrrhotite, and chalcopyrite in a contact zone between altered [Cretaceous?] diorite porphyry and metamorphosed, calcareous sedimentary rocks. They collected two samples that averaged 0.3 percent copper and 1.6 parts per million (ppm) silver. One sample contained 1.6 parts per billion (ppb) gold. Samples of massive pyrrhotite and pyrite collected by Hedderly-Smith (1999 [Inventory]) contained up to 1.17 percent copper, 403 ppm molybdenum, 6.5 ppm silver, and 121 ppb gold. He describes the deposit as a garnet-chlorite-actinolite-diopside skarn near the contact of weakly propylitized granodiorite. The sedimentary rocks in the area are part of Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996).

Alteration:
The deposit is mineralized garnet-chlorite-actinolite-diopside skarn associated with altered [Cretaceous?] diorite porphyry (Maas and others, 1991) or propylitized granodiorite (Hedderly-Smith, 1999 [Inventory]).

Age of mineralization:
This skarn deposit is probably related to altered granodiorite. Its age is uncertain, but similar intrusions in the area have been variously dated as Mesozoic or Paleozoic, or Cretaceous (Eberlein and others, 1983; Brew, 1996).

Deposit model:
Cu-Mo skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only workings on the property are several open cuts and an adit that probably date to before WW I.

Production notes:

Reserves:

Additional comments:
This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Wright, 1909; Chapin, 1918; Cobb, 1978; Eberlein and others, 1983; Glavinovich, 1987; Maas and others, 1991; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (at head of Coco Harbor)

Site type: Occurrences

ARDF no.: CR140

Latitude: 55.0460 **Quadrangle:** CR A-4

Longitude: 133.0852

Location description and accuracy:
These occurrences are along the shoreline at the northwest head of Coco Harbor; they are about 0.2 mile southeast of the center of section 5, T. 79 S., R. 82 E.

Commodities:

Main: Ag, Au, Cu, Mo

Other:

Ore minerals: Chalcopyrite, molybdenite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:
As described by Maas and others (1991), this deposit consists of a large area of hornfels and skarn with molybdenum and copper mineralization. The deposit is in marble interlayered with felsic and mafic metavolcanic rocks, metagraywacke, and chlorite schist, all of which are cut by diorite dikes. The hornfels contains disseminated pyrite, pyrrhotite, molybdenite, and minor chalcopyrite. Quartz veins with pyrite, pyrrhotite, minor molybdenite, and rare chalcopyrite, are locally abundant. In 28 samples, the highest molybdenum value was 0.24 percent across a foot-thick quartz vein. The maximum copper value was 601 parts per million (ppm); the highest gold value was 34 ppm, but most samples contained less than 5 parts per billion. Hedderly-Smith (1999 [Inventory]) sampled a piece of limestone float with an 8-inch-thick quartz vein containing chalcopyrite, pyrite, and an unidentified black mineral. The sample contained 2,375 ppm copper, 4.2 ppm silver, and 1.1 ppm gold. The rocks in the area are part of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). A Cretaceous(?) pluton is nearby (see CR139).

Alteration:
Mineralization associated with skarn and hornfels.

Age of mineralization:
Silurian or Ordovician or younger.

Deposit model:
Ag-Cu-Mo skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only surface sampling by government and industry geologists.

Production notes:

Reserves:

Additional comments:

These occurrences are on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Silver Star

Site type: Prospect

ARDF no.: CR141

Latitude: 55.0204 **Quadrangle:** CR A-4

Longitude: 133.0670

Location description and accuracy:
The location of the Silver Star prospect is uncertain. For this record, the site is about 1.4 miles west-northwest of the head of Windy Cove, in the NW1/4 section 16, T. 79 S., R. 82 E. However, Maas and others (1991) could not find the prospect, and suggest that it may be farther to the west, possibly a mile or more away.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, sphalerite

Gangue minerals:

Geologic description:
As described by Chapin (1916), the deposit at the Silver Star prospect is in limestone and consists of two parallel veins less than 2.5 feet thick. The veins contain sphalerite, chalcopyrite, galena, and 'notable' gold and silver. The workings consist of an adit with two drifts. There is no more recent description of the deposit and it could not be located by Maas and others (1991) or by Hedderly-Smith (1999 [Inventory]). The host rock probably is Heceta Limestone of Silurian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Probably Silurian or younger.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
The workings consist of an adit with two drifts that date to before 1918.

Production notes:

Reserves:

Additional comments:
The location of the Silver Star prospect is uncertain. It may be on land that has been conveyed to the

Sealaska Corporation, or is under application for transfer to them.

References:

Chapin, 1916; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1999 (Inventory).

Primary reference: Chapin, 1916

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on Goat Island)

Site type: Occurrence

ARDF no.: CR142

Latitude: 55.2031 **Quadrangle:** CR A-3

Longitude: 132.9350

Location description and accuracy:
This occurrence is on the west coast of Goat Island about 0.3 mile east-southeast of triangulation station Timmy. It is about 0.5 mile northwest of the southeast corner of section 8, T. 77 S., R. 83 E.

Commodities:

Main: Ag, Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
This occurrence was discovered during a search for the source of a gold geochemical anomaly (Maas and others, 1991; Hedderly-Smith, 1999 [Inventory]). The rocks in the vicinity consist of argillite with subordinate volcanic flows, agglomerate, and chert. The argillite is locally silicified and contains small pods of massive pyrite. A sample from a quartz stockwork with 50 percent pyrite and intense hematite and limonite staining contained 0.564 parts per million (ppm) gold and 2.0 ppm silver (Maas and others, 1991).

Alteration:
A sample from a quartz stockwork with 50 percent pyrite has intense hematite and limonite staining.

Age of mineralization:

Deposit model:
Insufficient evidence.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
Only surface sampling by government agency.

Production notes:

Reserves:

Additional comments:

References:

Maas and others, 1991; Maas and others, 1995; Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Deer Bay)

Site type: Prospect

ARDF no.: CR143

Latitude: 55.2293 **Quadrangle:** CR A-3

Longitude: 132.6739

Location description and accuracy:
This prospect is near the point south of the mouth of Deer Bay. It is near the northeast corner of section 1, T. 77 S., R. 84 E.

Commodities:

Main: Ag, Au, Pb

Other: Nb?

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
There is an old adit less than 20 feet long at this prospect but there is no record of who did the work or when it was done, nor is there any record of production (Herreid and others, 1978; Maas and others, 1991, 1995). The rocks in the area consist of quartz-sericite-chlorite schists, pyroclastic breccia, and metabasite. Locally there are quartz veins parallel to the layering. Herreid and others (1978) collected a sample of pyrite-quartz-sericite schist that contained 20 parts per million (ppm) gold and 90 ppm lead. A table in their report also lists niobium, but they do not give a value for it in their description of the sample nor are significant amounts of niobium likely in this geologic environment. Maas and others (1991) collected 8 samples; their highest value was 210 parts per billion gold and 1.6 ppm silver.

Alteration:

Age of mineralization:

Deposit model:
Insufficient evidence to determine.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status: Undetermined

Workings/exploration:
Explored by an old adit less than 20 feet long; sampled by several government agencies.

Production notes:

Reserves:

Additional comments:

This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (west of Eek Lake)

Site type: Occurrence

ARDF no.: CR144

Latitude: 55.1759 **Quadrangle:** CR A-3

Longitude: 132.6800

Location description and accuracy:

This occurrence is at an uncertain location west of Eek Lake. For this record, the coordinates are at about the middle of the west shore of Eek Lake in section 24, T. 77 S., R. 84 E. Alternatively, the occurrence may be on the west side of the large unnamed lake just to the south in section 25. It thus may be a mile or more from the coordinates.

Commodities:

Main: Ag, Cu, Mo, Zn

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:

While following up a geophysical anomaly in 1992, Alaska Copper and Nickel Company found what they originally thought was a stratiform pyrite-chalcopryite deposit on the west side of Eek Lake (Hedderly-Smith, 1999 [Inventory]). Samples across 1 meter of outcrop contained 5.2 to 10 percent copper, 251 to 269 parts per million (ppm) zinc, and 5.0 to 6.1 ppm silver. The company subsequently revisited the property and concluded that it was a vein, based on samples that contained up to 111 ppm molybdenum. There is no other information about the deposit. It may be on either side of a fault contact between greenstone, schist, and phyllite of the Wales Group of Late Proterozoic and Cambrian age and sedimentary rocks of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Ambiguous.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Limited surface sampling by industry in 1992.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (on Flat Island)

Site type: Prospect

ARDF no.: CR145

Latitude: 55.0906 **Quadrangle:** CR A-3

Longitude: 132.6938

Location description and accuracy:
This prospect reportedly is near the east shoreline of central Flat Island, in section 24, T. 78 S., R. 84 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals: Quartz

Geologic description:
Bufvers (1967) reports that a rich quartz vein was found on the beach at this site, probably in the late 1880's. Too much powder was used to expose it and most of the gold was blasted into the water. A few thousand dollars in gold was said to have been recovered. Maas and others (1991) searched for this prospect without success, but did find several slightly mineralized quartz veins in the area. The best of these, a sample from Blanket Island with chalcopyrite in the quartz, contained 1,734 parts per million copper and no gold. The rocks in the area are basalt and andesite of Silurian or Ordovician age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Unknown other than that the prospect is in Silurian or Ordovician rocks.

Deposit model:
Gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
Some gold was said to be have produced from unspecified, probably surface workings, probably in the 1880's.

Production notes:
A few thousand dollars in gold (at $20.67 per ounce?) was said to have been recovered in the 1880's.

Reserves:

None.

Additional comments:

References:

Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Bufvers, 1967

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near High Point)

Site type: Prospect

ARDF no.: CR146

Latitude: 55.0201 **Quadrangle:** CR A-3

Longitude: 132.9596

Location description and accuracy:
This prospect is on the beach near High Point at the south mouth of Baldy Bay. It is just northeast of the center of section 18, T. 79 S., R. 83 E.

Commodities:

Main: Ag, Fe

Other:

Ore minerals: Hematite

Gangue minerals:

Geologic description:
Roehm (1947) investigated a report that in 1906 Val Klemm located a deposit of hematite on the beach in a small bight near High Point on Dall Island, and drove a 48-foot adit on it without reaching ore. The deposit was said to be 20 feet wide and could be traced for 2,000 feet up the mountainside, along a contact between limestone and greenstone. A sample contained 55.5 percent iron and 6 ounces of silver per ton. Roehm searched for the deposit in 1947 but did not find it. However, he did locate several hematite stringers along limestone-greenstone contacts in the area; the hematite is probably secondary after pyrite. The rocks in the area are schist, greenstone, and marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:
Band of hematite with silver values.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
A 48-foot adit was said to be driven in about 1906.

Production notes:

Reserves:

Additional comments:

This prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Roehm, 1947 (MIR 195-43); Eberlein and others, 1983; Brew, 1996.

Primary reference: Roehm, 1947

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gould

Site type: Prospect

ARDF no.: CR147

Latitude: 55.0191 **Quadrangle:** CR A-3

Longitude: 132.7601

Location description and accuracy:
The Gould prospect is near the south end of Sukkwan Island about 0.7 mile south of the south end of Sukkwan Lake. It is near the center of section 16, T. 79 S., R. 84 E.

Commodities:

Main: Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, pyrrhotite, sphalerite

Gangue minerals:

Geologic description:
As described by Chapin (1919), the Gould deposit is in schist near a granite contact. Chalcopyrite, pyrite, and pyrrhotite occur both in layers parallel to the foliation in the schist and in veinlets that crosscut the foliation. There was some surface exploration in 1917. The contact is between leucosyenite of early Permian or Late Pennsylvanian age and sedimentary rocks of the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983; Brew, 1996). This contact was examined by Maas and others (1991), and while they could not find the old workings, they did find occurrences of pyrite and pyrrhotite with chalcopyrite along a mile of the contact. The sulfides occur mainly along the layering in the sedimentary rocks. Several samples were taken along the contact; the highest values were 1,187 parts per million (ppm) zinc and 485 ppm copper.

Alteration:

Age of mineralization:
Unclear whether the mineralization is related to the Silurian or Ordovician host rocks or to the adjacent Permian or Pennsylvanian leucosyenite.

Deposit model:
Unclear whether syngenetic or epigenetic.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
There probably was some surface work done before 1919 but the workings could not be located in 1991.

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1919; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Magnetite Cliff

Site type: Prospects

ARDF no.: CR148

Latitude: 55.2490 **Quadrangle:** CR A-2

Longitude: 132.6284

Location description and accuracy:

The Magnetite Cliff prospects are at an elevation of about 1,600 feet, about 1.2 miles northwest of Copper Mountain and about 0.6 mile northwest of the southeast corner of section 27, T. 76 S., R. 84 E. This record also includes several copper-bearing magnetite occurrences in skarn about 2,800 feet east of the Magnetite Cliff prospects; these have been called the 'Upper Magnetite' occurrences.

Commodities:

Main: Cu, Fe

Other: Ag?, Au?

Ore minerals: Chalcopyrite, magnetite

Gangue minerals: Diopside, garnet, quartz

Geologic description:

The Magnetite Cliff prospect is one of several similar iron skarn deposits in Jumbo Basin (Kennedy, 1953; Herreid and others, 1978; Maasand others, 1995). The rocks in Jumbo Basin consist of intensely folded marble, calcareous schist, and quartz-mica schist, overlain, possibly unconformably, by a thick greenstone unit; all are part of the Wales Group of Late Proterozoic or Cambrian age (Herreid and others, 1978; Eberlein and others, 1983; Brew, 1996). The metamorphic rocks are intruded by a large Cretaceous stock that is mainly granodiorite but locally varies to gabbro. Altered andesite dikes and sills are common. The deposits at the Magnetite Cliff and nearby prospects are part of a band of skarn up to 1,000 feet wide at the marble-granodiorite contact.

It is uncertain when the Magnetite Cliff prospect was discovered, but it was identified by symbol before 1908 as part of the Jumbo Group (Wright and Wright, 1908). The prospect was developed by 4 short adits but has not produced any ore. Several similar occurrences nearby that are included in this record are often called the 'Upper Magnetite' deposits (Kennedy, 1953; Maas and others, 1995).

The Magnetite Cliff prospect consists of 3 tabular magnetite lenses that contain 2 to 3 percent chalcopyrite (Kennedy, 1953). In contrast to the Jumbo Mine (CR150), there is no molybdenite. The largest of these lenses is about 300 feet wide, up to 50 feet thick, and can be traced down dip for several hundred feet. The lenses strike about N25W and dip 30-60NE; they are in the band of skarn at the marble-granodiorite contact. The skarn consists almost entirely of diopside and garnet; the marble-skarn contact is sharp and little marble remains in the skarn. The granodiorite near the contact is intensely altered and locally is totally replaced by diopside and garnet.

The Upper Magnetite deposits are 5 small, irregular-shaped masses of magnetite with a few percent of disseminated chalcopyrite, scattered over an area about 1,200 feet long. They occur in roof pendants of marble and skarn next to the granodiorite or in skarn in the granodiorite. As at the Magnetite Cliff prospect, the skarn consists mostly of diopside and garnet, but it also contains some quartz. The contact between the skarn and marble is gradational.

Before WW II, the Magnetite Cliff prospect was usually described as part of the Jumbo Mine. In his detailed study, Kennedy (1953) did extensive geological and geophysical work on the Magnetite Cliff prospect, as well as on the similar magnetite bodies nearby. The deposits have since been examined several times and drilled, usually as part of more extensive exploration that included the Jumbo Mine and other copper properties nearby. The Anaconda Company worked in the area in the 1950's and conducted several geophysical surveys in the 1960's (Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965). Hanna Mining examined the property (Hogg , 1965), and Cominco Alaska Exploration sampled and mapped the area in 1989 and 1990.

Kennedy (1953) estimates that the Magnetite Cliff prospect has approximately 370,000 tons of indicated and inferred ore with a grade of about 45 percent iron and 0.73 percent copper. None of the other magnetite occurrences has more than a few thousand tons of ore and collectively they probably contain less than 50,000 tons. The current annual minerals report of the State of Alaska (Swainbank and others, 2002)--as have their annual reports for many years--estimates the 'Jumbo' reserves as 650,000 tons of ore with an average grade of 45.2 percent iron, 0.75 percent copper, 0.01 ounce of gold per ton, and 0.08 ounce of silver per ton. Those reserves probably include the reserves defined by Kennedy at the Magnetite Cliff and nearby deposits.

Alteration:

Magnetite lenses associated with diopside-garnet skarn. Andesite dikes and sills are altered.

Age of mineralization:

Iron-copper skarn probably related to Cretaceous granodiorite exposed at the surface nearby.

Deposit model:

Iron-copper skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18d

Production Status:

Site Status:

Workings/exploration:

Prospecting in the area began by at least 1879, although copper was reported in the area earlier by Russians and Indians (Wright, 1915; Kennedy, 1953; Herreid and others, 1978; Roppel, 1991). By 1905, considerable reserves had been defined at the nearby Jumbo Mine (CR150), which produced copper ore from 1907 to 1923. The Magnetite Cliff deposit was found early in the history of the area, but in early reports it was usually described as part of the Jumbo property (Brooks, 1902; Wright and Wright, 1908; Wright, 1915; Wright and Fosse, 1946). The most detailed study of the Magnetite Cliff deposit is by Kennedy (1953), who described the rocks in detail and mapped the surface and underground workings. The deposit has since been examined several times. The Anaconda Company examined the area in the 1950's and conducted several geophysical surveys in the 1960's (Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965). Hanna Mining examined the property (Hogg , 1965), and Cominco Alaska Exploration mapped and sampled the deposits in 1989 and 1990.

Production notes:

Reserves:

Kennedy (1953) estimates that the Magnetite Cliff prospect has approximately 370,000 tons of indicated and inferred ore with a grade of about 45 percent iron and 0.73 percent copper. None of the other magnetite occurrences has more than a few thousand tons of ore and collectively they probably contain less than 50,000 tons. The current annual minerals report of the State of Alaska (Swainbank and others, 2002)--as have their annual reports for many years--estimates the 'Jumbo' reserves as 650,000 tons of ore with an average grade of 45.2 percent iron, 0.75 percent copper, 0.01 ounce of gold per ton, and 0.08 ounce of silver per ton. Those reserves probably include the reserves defined by Kennedy at the Magnetite Cliff and nearby deposits.

Additional comments:

The Magnetite Cliff prospect is on a large block of patented claims. The land around it has been conveyed to the Sealaska Corporation or is under application for transfer to them.

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1914; Smith, 1914; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Chapin, 1918; Chapin, 1919; Martin, 1919; Martin, 1920; Brooks and Martin, 1921; Brooks and Capps, 1924; Burton, 1924; Brooks, 1925; Buddington and Chapin, 1929; Smith, 1942 (B 933-A); Wright and Fosse, 1946; Kennedy, 1953; Carr and Dutton, 1959; Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965; Hogg, 1965; Bufvers, 1967; Leavens and Thomssen, 1977; Herreid and others, 1978; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Roppel, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 2002.

Primary reference: Kennedy, 1953

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gonnason

Site type: Prospect

ARDF no.: CR149

Latitude: 55.2460 **Quadrangle:** CR A-2

Longitude: 132.6166

Location description and accuracy:
The Gonnason prospect is about 0.7 mile north-northwest of Copper Mountain and about 0.2 mile north-northwest of the southeast corner of section 27, T. 76 S., R. 84 E.

Commodities:

Main: Cu, Fe

Other:

Ore minerals: Chalcopyrite, magnetite

Gangue minerals:

Geologic description:
The Gonnason prospect was found in 1960 by the Hanna Mining Company (Hogg, 1965; Herreid and others, 1978). The deposit consists of a body of magnetite with chalcopyrite in skarn. As exposed on the surface, the body is about 150 by 225 feet in area and of unknown depth. A channel sample about 80 feet long across the deposit averaged 50.6 percent iron and 0.94 percent copper. Hogg (1965) estimated that the deposit is comparable in tonnage and grade to the Magnetite Cliff deposit (CR148). Although the body is in skarn, Kennedy (1953) and Herreid and others (1978) map the rocks in the area only as Cretaceous granodiorite. The deposit is probably in a small roof pendant of skarn in the granodiorite and is similar to the deposits at the nearby Jumbo Mine (CR150) and Magnetite Cliff (CR148).

Alteration:
Associated with magnetite-bearing skarn.

Age of mineralization:
Iron-copper skarn probably related to a nearby Cretaceous granodiorite intrusion.

Deposit model:
Iron-copper skarn (Cox and Singer, 1986; model 18d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18d

Production Status: None

Site Status: Active?

Workings/exploration:
Surface sampling and geophysical surveys.

Production notes:

Reserves:

Hogg (1965) estimated that the deposit is comparable in tonnage and grade to the Magnetite Cliff deposit (CR148).

Additional comments:

The Gonnason prospect is on a large block of patented claims. The land around it has been conveyed to the Sealaska Corporation or is under application for transfer to them.

References:

Hogg, 1965; Herreid and others, 1978; Maas and others, 1995.

Primary reference: Hogg, 1965

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Jumbo

Site type: Mine

ARDF no.: CR150

Latitude: 55.2415

Quadrangle: CR A-2

Longitude: 132.6154

Location description and accuracy:

The Jumbo Mine is at an elevation of about 2,000 feet, about 0.5 mile northwest of Copper Mountain, at the head of Jumbo Creek. The mine is shown by symbol but not named on the USGS 1:63,360-scale topographic map. It is about 0.6 mile northeast of the center of section 34, T. 76 S., R. 84 E. Kennedy (1953) provides detailed surface and underground maps of the area and the mine workings.

Commodities:

Main: Ag, Au, Cu, Fe, Mo, Zn

Other:

Ore minerals: Chalcopyrite, molybdenite

Gangue minerals: Diopside, garnet

Geologic description:

Prospecting in the Jumbo Mine area began as early as 1879, although copper was reported in the area earlier by Russians and Natives (Wright, 1915; Kennedy, 1953; Herreid and others, 1978; Roppel, 1991). By 1905, considerable reserves were defined and two aerial tramways, one 8,250 feet long and the other 600 feet long, were constructed from Hetta Inlet to the mine. The first ore was shipped in 1907 and by 1913, the Jumbo Mine was the biggest copper producer in the Ketchikan district. Mining ceased in 1918, and aside from a few thousand tons shipped in 1923, no ore has been produced since. The extensive underground workings consist of a large open stope, 3 tunnels, several winzes and raises, and a sublevel. The total production of the mine from 1907 to 1923 was 10.2 millions pounds of copper, 7,076 ounces of gold, and 87,778 ounces of silver, from 122,937 short tons of ore.

The mine was described in numerous early reports (Brooks, 1902; Wright and Wright, 1908; Wright, 1915; Wright and Fosse, 1946). The most detailed study of the mine was by Kennedy (1953), who described the rocks in the area in great detail, worked out the mineralogy of the skarns that are related to the deposit, and mapped the surface and underground workings. The deposit has since been examined several times. The Anaconda Company examined the property in the 1950's and conducted several geophysical surveys on it and nearby deposits in the 1960's (Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965). Hanna Mining examined the property (Hogg, 1965), and Cominco Alaska Exploration mapped and sampled the deposit in 1989 and 1990.

The rocks in Jumbo Basin consist of intensely folded marble, calcareous schist, and quartz-mica schist, unconformably overlain by a thick greenstone unit; all are part of the Wales Group of Late Proterozoic or Cambrian age (Herreid and others, 1978; Eberlein and others, 1983; Brew, 1996). The metamorphic rocks are intruded by a large Cretaceous stock that is mainly granodiorite but locally varies to gabbro. Altered andesite dikes and sills are common. The skarn forms bands in a zone up to 1,000 feet wide at the marble-granodiorite contacts.

The deposit at the Jumbo Mine is a classic copper skarn in a roof pendant of marble, skarn, and schist above a granitic intrusion (Kennedy, 1953; Herreid and others, 1978). The skarn consists mainly--about 80 percent--of garnet and diopside. The rest includes epidote, albite, orthoclase, quartz, stilbite, and talc. The skarn is almost entirely in the marble, remnants of which are commonly preserved in the skarn. The adjacent granitic rocks are largely skarn free but have been sericitized and chloritized. Chalcopyrite is disseminated in the skarn and altered dikes but the major ore bodies are several northwest-trending lenses of chalcopyrite-rich skarn and lenses of chalcopyrite in the skarn. Wright and Wright (1908) describe the ore body then being mined as nearly vertical, 30 to 40 feet thick, 120 feet long, and 140 feet deep. Fracturing is important in localizing the skarn, and chalcopyrite is localized along post-skarn fractures. The ore contains considerable molybdenite, pyrite, pyrrhotite, and hematite; sphalerite also occurs, and chalcanthite (CuSO4.5H2O) has been identified (Leavens and Thomssen, 1977). In contrast to several nearby deposits (for example, the Magnetite Cliff deposit at CR148), no magnetite is present in the Jumbo Mine skarns. The Jumbo Mine also is of considerable interest as a source of specimens of diopside and garnet.

Kennedy (1952) indicated that no ore reserves remained in the Jumbo Mine. However, he and Bufvers (1967) noted that ore-grade material was exposed in the flooded, lowest workings. Kennedy's (1952) estimates of the ore reserves in the Jumbo Basin area refer only to the Magnetite Cliff and nearby deposits (CR148), not to the Jumbo Mine. The current annual minerals report of the State of Alaska (Swainbank and others, 2002)--as have their annual reports for many years--gives the 'Jumbo' reserves as 650,000 tons of ore with 45.2 percent iron, 0.75 percent copper, 0.01 ounce of gold per ton, and 0.08 ounce of silver per ton. Those reserves almost certainly include those at the Magnetite Cliff and nearby deposits; it is not clear whether they attribute any to the Jumbo Mine (which has little if any magnetite). The State estimate may also include reserves at the Gonnason prospect (CR149).

Alteration:

Development of skarn. The adjacent granitic rocks are sericitized and chloritized. Andesite dikes and sills are altered.

Age of mineralization:

Copper skarn probably related to a deeper phase of the Cretaceous granodiorite intrusion exposed at the surface.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b

Production Status: Yes

Site Status: Active?

Workings/exploration:

Prospecting in the Jumbo Mine area began as early as 1879, although copper was reported in the area earlier by Russians and Natives (Wright, 1915; Kennedy, 1953; Herreid and others, 1978; Roppel, 1991). By 1905, considerable reserves were defined and two aerial tramways, one 8,250 feet long and the other 600 feet long, were constructed from Hetta Inlet to the mine. The first ore was shipped in 1907 and by 1913, the Jumbo Mine was the biggest copper producer in the Ketchikan district. Mining ceased in 1918, and aside from a few thousand tons shipped in 1923, no ore has been produced since. The extensive underground workings consist of a large open stope, 3 tunnels, several winzes and raises, and a sublevel.

The mine was described in numerous early reports (Brooks, 1902; Wright and Wright, 1908; Wright, 1915; Wright and Fosse, 1946). The most detailed study of the mine was by Kennedy (1953), who described the rocks in the area in great detail, worked out the mineralogy of the skarns that are related to the deposit, and mapped the surface and underground workings. The deposit has since been examined several times. The Anaconda Company examined the property in the 1950's and conducted several geophysical surveys on it and nearby deposits in the 1960's (Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965). Hanna Mining examined the property (Hogg, 1965), and Cominco Alaska Exploration mapped and sampled the deposit in 1989 and 1990.

Production notes:

The total production of the mine from 1907 to 1923 was 10.2 millions pounds of copper, 7,076 ounces of gold, and 87,778 ounces of silver, from 122,937 short tons of ore.

Reserves:

Kennedy (1952) indicated that no ore reserves remained in the Jumbo Mine. However, he and Bufvers (1967) noted that ore-grade material was exposed in the flooded, lowest workings. Kennedy's (1952) estimates of the ore reserves in the Jumbo Basin area refer only to the Magnetite Cliff and nearby deposits (CR148), not to the Jumbo MIne. The current annual minerals report of the State of Alaska (Swainbank and others, 2002)--as have their annual reports for many years--gives the 'Jumbo' reserves as 650,000 tons of ore with 45.2 percent iron, 0.75 percent copper, 0.01 ounce of gold per ton, and 0.08 ounce of silver per ton. Those reserves almost certainly include those at the Magnetite Cliff and nearby deposits; it is not clear whether they attribute any to the Jumbo Mine (which has little if any magnetite). The State estimate may also include reserves at the Gonnason prospect (CR149).

Additional comments:

The Jumbo Mine is on a block of patented claims. The land around it has been conveyed to the Sealaska Corporation, who hold surface and subsurface rights, or the land is under application for transfer to them.

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1910; Knopf, 1910; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1914; Smith, 1914; Brooks, 1915; Wright, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Chapin, 1918; Chapin, 1919; Martin, 1919; Martin, 1920; Brooks and Martin, 1921; Brooks and Capps, 1924; Burton, 1924; Brooks, 1925; Buddington and Chapin, 1929; Smith, 1942 (B 933-A); Smith, 1942 (B 926-C); Wright and Fosse, 1946; Kennedy, 1953; Hogg, 1965; Bufvers, 1967; Leavens and Thomssen, 1977; Herreid and others, 1978; Cobb, 1978; Gonnason Exploration, 1963; Hings, 1964; Klobusicky, 1965; Eberlein and others, 1983; Maas and others, 1991; Roppel, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 2002.

Primary reference: Kennedy, 1953

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Corbin

Site type: Mine

ARDF no.: CR151

Latitude: 55.2308 **Quadrangle:** CR A-2

Longitude: 132.6505

Location description and accuracy:
The Corbin Mine is shown on the 1:63,360-scale USGS topographic map. It is at sea level about 0.3 mile southeast of Corbin Point, and about 0.4 mile west-northwest of the southeast corner of section 33, T. 76 S., R. 84 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
The Corbin Mine was discovered between 1900 and 1903. By 1913, it was developed by a 100-foot shaft (now flooded) with crosscuts and drifts from it, 337-foot and 25-foot adits, and surface trenches (Wright and Wright, 1908; Bufvers, 1967; Maas and others, 1991,1995; Hedderly-Smith, 1999 [Inventory]). A little ore was shipped from 1905 to 1913 but there has been no mining since. In 1991, geologists from the Sealaska Corporation conducted several geophysical surveys in the area. American Copper and Nickel Company leased the property and mapped the area in 1992; they drilled three holes in 1993. The first hole was lost, the second did not cut mineralization, and the third cut two of the three known mineralized layers.
The Corbin deposit is a volcanogenic massive sulfide deposit that consists of three layers or lenses of mineralization one to two feet thick (Wright and Wright, 1908; Herreid and others, 1978; Maas and others, 1991,1995; Hedderly-Smith, 1999 [Inventory]). One of the layers extended for at least 250 feet in the underground workings. The host rocks are quartz-sericite schist, chlorite schist, and phyllite of the Wales Group of Late Proterozoic and Cambrian age (Everlein and others, 1983; Brew, 1996; Slack and others, 2002). The layers consist mainly of pyrite, chalcopyrite, and sphalerite in siliceous gangue. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age. The ore mined from 1905 to 1913 contained about $3.00 in gold and silver at prices current then. A 4-foot sample across one of the lenses exposed in an adit contained 3.25 percent copper, 4.15 percent zinc, 24.0 parts per million silver, and 1,395 parts per billion gold (Maas and others, 1991, 1995). Grab samples of massive sulfides from the dump contained up to 9 percent copper, 21 percent zinc, 2.7 ounces of silver per ton, and 0.11 ounce of gold per ton (Hedderly-Smith, 1999 [Inventory]).

Alteration:

Age of mineralization:
Probably contemporaneous with the deposition of the protoliths of the metamorphic host rocks, which are part of the Wales Group of Late Proterozoic and Cambrian age.

Deposit model:
Kuroko massive sulfide (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The Corbin Mine was discovered between 1900 and 1903. By 1913, it was developed by a 100-foot shaft (now flooded) with crosscuts and drifts from it, 337-foot and 25-foot adits, and surface trenches (Wright and Wright, 1908; Bufvers, 1908; Maas and others, 1991 and 1995; Hedderly-Smith, 1999 [Inventory]). American Copper and Nickel Company leased the property and mapped the area in 1992; they drilled three holes in 1993.

Production notes:
There were several small shipments of ore from 1905 to 1913.

Reserves:
None.

Additional comments:
The Corbin Mine is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Wright and Wright, 1908; Wright, 1915; Herreid and others, 1978; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Hedderly-Smith, 1990; Hedderly-Smith, 1991 (1990 season); Maas and others, 1991; Roppel, 1991; Hedderly-Smith, 1992 (1991 season); Maas and others, 1995; Hedderly-Smith, 1995 (Kael-Dolomi); Brew, 1996; Hedderly-Smith, 1999 (Inventory); Slack and others, 2002.

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Copper Mountain; New York; Illinois; Miller; Texas

Site type: Mine

ARDF no.: CR152

Latitude: 55.2336 **Quadrangle:** CR A-2

Longitude: 132.6068

Location description and accuracy:

This site is at the mine symbol at an elevation of about 3,300 feet on the USGS 1:63,360-scale topographic map, about 0.3 mile south-southwest of Copper Mountain. This is the location of the principal workings on the property. The workings are on a large block of claims that extend south to the head of Copper Harbor and north on the Copper Mountain ridge for some distance. There are numerous adits on the property and one long tunnel, as well as numerous pits and trenches. Maas and others (1995) include a detailed map of the surface and underground workings where most of the mining took place.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Azurite, chalcopyrite, magnetite, malachite

Gangue minerals:

Geologic description:

The deposits at the Copper Mountain Mine and the surrounding claim block are related to a north-trending tongue of altered Cretaceous granodiorite about 600 feet wide that is bordered on the east by hornfels and on the west by Late Proterozoic or Cambrian marble of the Wales Group (Wright and Wright, 1908; Herreid and others, 1978; Maas and others, 1995). The contacts of the granodiorite are marked by extensive skarn with various combinations of diopside, epidote, garnet, magnetite, and scapolite. The skarn locally is quartz veined and often includes masses of fractured marble. The skarn contains disseminations and irregular masses of chalcopyrite, which in places forms high-grade pockets; malachite and azurite are prominent in the surface workings.

The Copper Mountain Mine was discovered in 1897 and by 1905, a substantial town, including a hotel, a 250-ton-per-day smelter, and numerous buildings had been erected at the head of Copper Harbor to service the mine; an aerial tram was built from the top of the Copper Mountain to the smelter to transport the ore; and the company had bought a coal mine and coke ovens in Washington to fuel the smelter. Most of the ore that was mined came from surface pits on the New York claims (where this site is located) on the ridge southwest of Copper Mountain. The skarn there locally contained small masses of chalcopyrite and copper carbonates that initially fed the smelter but did not provide sufficient tonnage to sustain its operation. A 3,100-foot tunnel was driven to test the intrusive-skarn contact about 1,000 feet below the surface workings. Numerous short adits and prospect pits also were driven on copper shows on the claims. Small masses of copper-rich material were found in the tunnel and in various other workings, but no substantial ore bodies were found. There were other minor workings to the south in this claim block, including the Texas claim, at an elevation of about 1,450 feet. The deposits are similar to the one at the Copper Mountain Mine, but none was of significant size.

From 1903 to 1907, the Copper Mountain Mine produced 224,285 pounds of copper, 10,331 ounces of silver, and 145 ounces of gold from 5,678 tons of ore. However, in 1907 it became apparent that the mine could not furnish sufficient ore to support the smelter, nor could it ship ore economically. The mine was closed and by 1919 the physical plant was largely dismantled or abandoned, although a large claim block was patented in 1914. This is a classic example of a large mine plant and smelter that was developed in anticipation of ore that never materialized, as is well documented by Roppel (1991).

Alteration:
Extensive development of skarn at the periphery of a Cretaceous granodiorite intrusion.

Age of mineralization:
Copper skarn probably is related to a deeper phase of the Cretaceous granodiorite intrusion exposed at the surface.

Deposit model:
Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The Copper Mountain Mine was discovered in 1897 and by 1905, a substantial town, including a hotel, a 250-ton-per-day smelter, and numerous buildings had been erected at the head of Copper Harbor to service the mine; an aerial tram was built from the top of the Copper Mountain to the smelter to transport the ore; and the company had bought a coal mine and coke ovens in Washington to fuel the smelter. Most of the ore that was mined came from surface pits on the New York claims (where this site is located) on the ridge southwest of Copper Mountain. The skarn there locally contained small masses of chalcopyrite and copper carbonates that initially fed the smelter but did not provide sufficient tonnage to sustain its operation. A 3,100-foot tunnel was driven to test the intrusive-skarn contact about 1,000 feet below the surface workings. Numerous short adits and prospect pits also were driven on copper shows on the claims. Small masses of copper-rich material were found in the tunnel and in various other workings, but no substantial ore bodies were found. There were other minor workings to the south in this claim block, including the Texas claim, at an elevation of about 1,450 feet. The deposits are similar to the one at the Copper Mountain Mine, but none was of significant size.

Production notes:
From 1903 to 1907, the Copper Mountain Mine produced 224,285 pounds of copper, 10,331 ounces of silver, and 145 ounces of gold from 5,678 tons of ore. However, in 1907 it became apparent that the mine could not furnish sufficient ore to support the smelter, nor could it ship ore economically. The mine was closed and by 1919 the physical plant was largely dismantled or abandoned, although a large claim block was patented in 1914. This is a classic example of a large mine plant and smelter that was developed in anticipation of ore that never materialized, as is well documented by Roppel (1991).

Reserves:
None.

Additional comments:
The Copper Mountain Mine is on a large block of patented claims. The land around it has been conveyed to the Sealaska Corporation or is under application for transfer to them. The subsurface rights to the claim block are held by the Sealaska Native Corporation.

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Brooks, 1913; Smith, 1914; Brooks, 1915; Wright, 1915; Chapin, 1916; Brooks, 1921; Wright and Fosse, 1946; Bufvers, 1967; Herreid and others, 1978; Cobb, 1978; Maas and others, 1991; Roppel, 1991; Maas and others, 1995.

Primary reference: Roppel, 1991; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Green Monster

Site type: Mine

ARDF no.: CR153

Latitude: 55.2457 **Quadrangle:** CR A-2

Longitude: 132.5487

Location description and accuracy:

The Green Monster Mine is at an elevation of about 2,500 feet, about 0.2 mile east of Lake Josephine and about 0.4 mile west-northwest of the southeast corner of section 30, T. 76 S., R. 85 E.

Commodities:

Main: Ag, Cu, Epidote, Fe

Other: Au?

Ore minerals: Chalcopyrite, galena, magnetite, molybdenite, pyrite, pyrrhotite

Gangue minerals: Albite, epidote, garnet, hornblende, quartz

Geologic description:

The Green Monster Mine was located in 1900 and most of the early work was done prior to WW I (Brooks, 1902; Wright and Wright, 1908; Wright, 1915; Wedow and others, 1953; Herreid and others 1978; Maas and others, 1991,1995). The early workings consisted of two 65-foot adits and several trenches and open pits on 14 fourteen patented claims. The deposits are in hornfels and albite-quartz-epidote-garnet-hornblende skarn developed from late Proterozoic or Cambrian marble of the Wales Group. The metamorphic rocks are bordered on the west by a Cretaceous granodiorite stock and on the east by a smaller stock of epidotized, Cretaceous gabbro and diorite. The deposits explored before WW I are mainly irregular masses of chalcopyrite and magnetite in skarn, and chalcopyrite in irregular quartz veins and masses associated with steeply-dipping faults. Galena, pyrrhotite, pyrite, and molybdenite are locally present. Brooks (1902) reports gold assays of up to $8-$10 per ton in high grade samples (gold at $20.67 per ounce). Maas and others (1991) collected several samples that contained up to 6.93 percent copper, 40.2 parts per million silver, and 1,868 parts per billion gold, and noted that there is significant tonnage of copper ore in sight.

For several decades, there has been substantial production of epidote crystals from a small open pit several hundred feet southeast of the old adits. The epidote from this locality is widely known and specimens of it are found in museums and private collections throughout the world (Leavens and Thomssen, 1977). The mine is closed to private collection and as of 2004 is being mined by Doug Toland.

Alteration:

The deposits are associated with skarn and hornfels developed in marble near Cretaceous granitic bodies to the west and east.

Age of mineralization:

The deposit is between two Cretaceous granitic bodies, one or both of which is probably the source of the metals and of the skarn and hornfels host rocks.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b

Production Status: Yes; small

Site Status: Active

Workings/exploration:

The Green Monster deposit was discovered in 1900 and most of the early work was done prior to WW I. The early workings consisted of two 65-foot adits and several trenches and open pits on 14 fourteen patented claims. For several decades, there has been substantial production of epidote crystals from a small open pit several hundred feet southeast of the old adits. The epidote from this locality is widely known and specimens of it are found in museums and private collections throughout the world (Leavens and Thomssen, 1977). The mine is closed to private collection and as of 2004 is being mined by Doug Toland.

Production notes:

Epidote crystals have been produced for at least the last 20 years by
Doug Toland. The quantity is unknown but the production is probably substantial on the scale of the mineralogical trade. This locality is known as the source for some of the finest known examples of epidote crystals; they are featured in collections and museums throughout the world and many have been sold for large sums.

Reserves:

There are no published ore reserves. There is every indication, however, that world-class epidote crystals will continue to be mined indefinitely on a small scale from this deposit.

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1915; Wright and Fosse, 1946; Wedow and others, 1953; Leavens and Thomssen, 1977; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Roppel, 1991; Maas and others, 1995.

Primary reference: Leavens and Thomssen, 1977; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Rex; Idela

Site type: Prospect

ARDF no.: CR154

Latitude: 55.2382 **Quadrangle:** CR A-2

Longitude: 132.5253

Location description and accuracy:

This prospect consists of several short adits and surface workings at an elevation of about 1,900 feet, about 0.5 mile southeast of the top of Green Monster Mountain. The workings are about 0.1 mile north of the center of section 32, T. 76 S., R. 85 E. The prospect is on a large block of (14?) patented claims that extends northwest to the Green Monster Mine (CR153).

Commodities:

Main: Ag, Cu, Zn

Other: Pb

Ore minerals: Chalcopyrite, magnetite, sphalerite

Gangue minerals: Diopside, epidote, garnet

Geologic description:

This prospect consists of three short caved adits and some pits and trenches that probably date from before WW I. All or most are on a large block of (14?) patented claims that extends northwest to the Green Monster Mine (CR153).

The deposit consists of mineralized zones along faults in garnet-epidote-diopside skarn (Chapin, 1918; Herreid and others, 1978). The skarn is developed at the contact between Cretaceous granodiorite and Late Proterozoic or Cambrian marble of the Wales Group. The mineralized zones contain disseminations and irregular masses of magnetite, chalcopyrite, and sphalerite. One high-grade sample contained 16.0 percent copper, 2.0 percent zinc, 175 parts per million lead, and 5.1 ounces of silver per ton (Herreid and others, 1978). There is no record of production.

Alteration:

Development of garnet-epidote-diopside skarn.

Age of mineralization:

Probably Cretaceous.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b

Production Status: None

Site Status: Active?

Workings/exploration:

This prospect consists of three short caved adits and some pits and trenches that probably date from before

WW I. All or most are on a large block of (14?) patented claims that extends northwest to the Green Monster Mine (CR153).

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1918; Herreid and others, 1978.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Russian Bear

Site type: Prospect

ARDF no.: CR155

Latitude: 55.2226 **Quadrangle:** CR A-2

Longitude: 132.5851

Location description and accuracy:

The location of the Russian Bear provided by Wright and Wright (1908) is unclear. They say that it is at an elevation of 100 feet about a mile northeast of the Gould Group (CR156). Their location of the Gould Group seems fairly unambiguous, but for the Russian Bear to be at an elevation of 100 feet, i.e. just above the shoreline, it would have to be west of the Gould Group. Neither location for the Russian Bear is consistent with the geology described below. For this record, the Russian Bear prospect is somewhat arbitrarily plotted about a half-mile northeast of the Gould Group at an elevation of about 1,000 feet, near the center of section 3, T. 77 S., R. 85 E. In support of this location, Herreid and others (1978) map skarn along a contact at this site and show unidentified workings nearby. Probably the best that can be said with certainty is that the Russian Bear prospect is near the head of Copper Harbor.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals: Garnet

Geologic description:

As described by Wright and Wright (1908), the Russian Bear claim is a contact-metamorphic copper deposit near a granitic batholith. The claim has been explored by trenches and open cuts. The deposit undoubtedly is similar to other contact-metamorphic copper deposits in the vicinity (for example, CR152 and 156). As mapped by Herreid and others (1978), the deposit is near the contact between Cretaceous granodiorite and albite-epidote hornfels; garnetiferous skarn is locally developed near the contact, where there are workings at several locations.

Alteration:

Garnet-bearing skarn developed near contact of Cretaceous granodiorite.

Age of mineralization:

Probably Cretaceous.

Deposit model:

Copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b

Production Status: None

Site Status: Inactive

Workings/exploration:
Apparently only trenches and open cuts prior to WW I.

Production notes:

Reserves:

Additional comments:
The Russian Bear prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Wright and Wright, 1908; Wright, 1909; Cobb, 1978; Herreid and others, 1978.

Primary reference: Wright and Wright, 1908; Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gould (near Hetta Inlet); Iron Crown; Paris

Site type: Prospects

ARDF no.: CR156

Latitude: 55.2182 **Quadrangle:** CR A-2

Longitude: 132.5978

Location description and accuracy:

The Gould and Iron Crown claim groups are north of Reynolds Creek at an elevation of about 300 feet and about 0.5 mile northeast of the head of Copper Harbor. They are centered about 0.2 mile north of the southwest corner of section 3, T. 77 S., R. 85 E. The Paris group of claims is identified only in the older literature. It is also at an elevation of about 300 feet and about 0.5 mile from the head of Copper Harbor, but the direction is not given. Wright and Wright (1908) imply that it is near the Gould claims and it is included in this description.

Commodities:

Main: Au, Cu

Other: Co, Ni

Ore minerals: Chalcopyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:

Wright and Wright (1908) describe the workings on the Gould claims as a 50 foot tunnel and a 40 foot shaft. The tunnel crosses the contact between Cretaceous granodiorite and Cambrian or older quartzite (Herreid and others, 1978). Minor disseminated chalcopyrite and pyrrhotite occur at the contact. The shaft exposes banded garnet-epidote skarn. As described by Maas and others (1991, 1995), the deposit is in altered granodiorite cut by shear zones that strike about S20E. Quartzite and calcareous schist outcrop west of the prospect. The highest value in four samples [of mineralized skarn?] was 2,015 parts per million (ppm) copper. Samples from two prospect pits on the Iron Crown claim nearby had no significant metal values, but massive sulfide boulders in the creek nearby contained 1,340 ppm nickel and 247 ppm cobalt.

On the Paris claims, a 115-foot tunnel explored a quartz vein about 1 foot thick that strikes NE (Wright and Wright, 1908). Samples contained low values of copper and gold. The country rock is banded quartzite of the Wales Group.

Alteration:

Cretaceous granodiorite is altered and sheared. The rocks adjacent to the granodiorite are hornfelsed and skarn is developed locally.

Age of mineralization:

The skarn is probably Cretaceous.

Deposit model:

Copper skarn and a mineralized quartz vein (Cox and Singer, 1986; models 18b and 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

18b, 36a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

There was considerable activity prior to WW I; the workings include 50- and 115-foot tunnels, a 40-foot shaft, and probably some surface trenches and pits.

Production notes:

Reserves:

Additional comments:

These old claims and prospects are on or surrounded by land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Wright and Wright, 1908; Wright, 1909; Wright, 1915; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hetta Mountain

Site type: Prospects

ARDF no.: CR157

Latitude: 55.1974 **Quadrangle:** CR A-2

Longitude: 132.5684

Location description and accuracy:
These prospects are at an elevation of about 2,800 feet near the summit of Hetta Mountain; they are in the NW1/4 section 14, T. 77 S., R. 85 E.

Commodities:

Main: Ag, Au, Cu, Fe, Zn

Other: Co, Mo, Pb

Ore minerals: Chalcopyrite, pyrrhotite, pyrite

Gangue minerals: Epidote, garnet, quartz

Geologic description:
The Hetta Mountain prospects are on 14 patented claims. The workings, all of which date from before WW I, consist of three short adits and several trenches (Wright and Wright ,1908; Wright, 1915; Herreid and others, 1978; Maas and others, 1991, 1995). The rocks in the vicinity consist of a faulted-bounded block of Late Proterozoic or Cambrian marble of the Wales Group that is surrounded by Cretaceous, albite-epidote hornfels and garnet-bearing hornblende hornfels. The metamorphic rocks are cut by several granitic dikes, and the marble is locally altered to skarn.

In one adit, a shear zone about 80 feet thick in marble contains diopside-garnet skarn with veinlets and blebs of chalcopyrite. In another adit, three short, en echelon pods of massive pyrite, pyrrhotite, and chalcopyrite replace marble along a porphyritic diorite dike (Herreid and others, 1978). A grab sample of rich ore contained 2.2 percent copper, 0.74 percent zinc, 12.3 ounces of silver per ton, 0.10 ounce of gold per ton, 600 parts per million (ppm) molybdenum, 750 ppm cobalt, and 22 ppm lead. Maas and others (1991) collected 15 samples from the prospects. Several had insignificant metal values, but the best contained 4.17 percent copper, 43.8 ppm silver, and 0.572 ppm gold. Wright and Wright (1908) show several additional prospects along the trail from the head of Copper Harbor to Hetta Mountain. At one, at an elevation of about 1,380 feet, a small mass of chalcopyrite is exposed in a 30-foot tunnel.

Alteration:
Locally, skarn is developed in marble.

Age of mineralization:
Probably Cretaceous.

Deposit model:
Copper skarn (Singer and Cox, 1987; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The Hetta Mountain prospects are on 14 patented claims. The workings, all of which date from before WW I, consist of three short adits and several trenches.

Production notes:

Reserves:

Additional comments:

The 14 patented claims at this propect are surrounded by land whose surface and subsurface rights have been conveyed to, or are under application for transfer to, the Sealaska Corporation.

References:

Wright and Wright, 1908; Wright, 1915; Cobb, 1978; Herreid and others, 1978; Glavinovich, 1987; Maas and others, 1991; Maas and others, 1995; Hedderly-Smith, 1997 (Hetta Lake); Hedderly-Smith, 1999 (Inventory).

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Lake Marge)

Site type: Occurrence

ARDF no.: CR158

Latitude: 55.2159 **Quadrangle:** CR A-2

Longitude: 132.5258

Location description and accuracy:
This occurrence is near the southwest shore of Lake Marge. It is about 0.6 mile southeast of the center of section 1, T. 77 S., R. 85 E.

Commodities:

Main: Cu, Mo

Other:

Ore minerals: Chalcopyrite, molybdenite

Gangue minerals: Epidote, garnet

Geologic description:
This occurrence is near the contact between albite-epidote hornfels and a tongue of Cretaceous granodiorite (Herreid and others, 1978). The area is cut by several faults that offset the contact. Under the name 'Lake Marge mineralized zone' in a list of mineral deposits, Herreid and others (1978) describe disseminated molybdenite and chalcopyrite in epidote-garnet skarn at this site. There is no indication of prospecting or exploration. Herreid and Trible (1973) also note molybdenum minerals in skarn about 0.8 mile to the west along the same contact.

Alteration:
Molybdenite and chalcopyrite disseminated in skarn that is probably related to a nearby Cretaceous granodiorite intrusion.

Age of mineralization:
Probably Cretaceous.

Deposit model:
Molybdenum-copper skarn (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: None

Site Status: Inactive

Workings/exploration:
Apparently none beyond surface examination by government geologists.

Production notes:

Reserves:

Additional comments:

References:

Herreid and Trible, 1973; Cobb, 1978; Herreid and others, 1978.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): HET; CPY

Site type: Occurrences

ARDF no.: CR159

Latitude: 55.1940 **Quadrangle:** CR A-2

Longitude: 132.5214

Location description and accuracy:
The HET and CPY occurrences are about 0.6 mile northeast of the head of Hetta Lake at about 1,400 to 1,500 feet in elevation. They are about 0.6 mile west-northwest of the center of section 18, T. 77 S, R. 86 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite

Gangue minerals:

Geologic description:
The HET and CPY occurrences are near a thrust contact between outcops of hornfels (Herreid and others, 1978; Maas and others, 1991, 1995) A Cretaceous granodiorite intrusion crops out just to the south on the north side of Hetta Lake. The occurrences consist of chalcopyrite-bearing float. The highest copper value in 6 samples was 1,251 parts per million copper; gold was not detected.

Alteration:
Development of hornfels.

Age of mineralization:
Probably Cretaceous.

Deposit model:
Copper skarn? (Cox and Singer, 1986; model 18b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b?

Production Status: None

Site Status: Probably inactive

Workings/exploration:
Only surface sampling by government geologists.

Production notes:

Reserves:

Additional comments:

These occurrences are on land whose surface and subsurface rights have been conveyed to, or are under application for transfer to, the Sealaska Corporation.

References:

Glavinovich, 1987; Hedderly-Smith, 1997 (Hetta Lake); Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995; Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Copper City

Site type: Mine

ARDF no.: CR160

Latitude: 55.1360 **Quadrangle:** CR A-2

Longitude: 132.6085

Location description and accuracy:
The Copper City Mine is shown on the USGS 1:63,360-scale topographic map in section 4, T. 78 S., R. 85 E.

Commodities:

Main: Ag, Au, Cu, Fe, Zn

Other: Ba, Pb

Ore minerals: Chalcopyrite, hematite, magnetite, pyrite, pyrrhotite, sphalerite

Gangue minerals: Calcite, epidote, quartz

Geologic description:
The Copper City Mine was discovered in 1898 and began production in 1910; it produced intermittently until 1910, when it flooded through a drill hole (Wright and Wright, 1908; Herreid and others, 1978; Roppel, 1991; Maas and others, 1991, 1995; Hedderly-Smith, 1999 [Inventory]). The total production was 85 tons of copper, 4,730 ounces of silver, and 341 ounces of gold (Maas and others, 1995). It was mined from an inclined, 300-foot shaft with several levels. The deposit was stoped to the surface and the main stope is exposed at the surface for about 300 feet just above the shoreline. In 1992, the deposit was leased to the American Copper and Nickel Company; they drilled one hole about 1,200 feet southwest of the old workings but did not encounter mineralization.

The rocks in the vicinity of the Copper City Mine are tuffaceous greenschist, pyroclastic breccia, and metabasite of the Wales Group of Late Proterozoic or Cambrian age (Herreid and others, 1978). In the older literature, the deposit is described as a quartz vein that trends about N25-40E and dips 40-60 NW (Wright and Wright, 1908; Wright, 1915). The modern interpretation is that it is a remobilized, volcanogenic massive-sulfide deposit in the Wales Group (Herreid and others, 1978; Maas and others, 1991, 1995; Hedderly-Smith, 1999 [Inventory]). The deposit is in a sequence of metakeratophyre, metaspilite, and distinctive grayish-red quartz-sericite schist (Herreid and others, 1978). The rocks and veins are locally folded and faulted and cut by several diabase dikes. The deposit consists of mineralized epidote-calcite-quartz veins that locally have high concentrations of chalcopyrite, pyrite, pyrrhotite, magnetite, hematite, and sphalerite; the wallrock adjacent to the veins commonly is bleached and contains talc. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age. The deposit has been sampled several times with varying results depending on the selectivity of the sampling. Maas and others (1991), for example, collected a chip sample across about 10 inches of banded mineralization that contained 8.5 percent copper, 7.30 percent zinc, 2.5 ounces of silver per ton, 0.05 ounce of gold per ton, 570 parts per million (ppm) lead, and 7,000 ppm barium. Hedderly-Smith (1999 [Inventory]) collected a composite high-grade sample from the dumps that contained 8.17 percent copper, 10.31 percent zinc, 3.41 ounces of silver per ton, and 0.185 ounce of gold per ton. A sample across 3 inches of massive sulfide in place contained 10.77 percent copper, 5.58 percent zinc, 1.82 ounces of silver per ton, and 0.171 ounce of gold per ton.

Alteration:
The wallrock adjacent to the veins commonly is bleached and contains talc.

Age of mineralization:
A remobilized Late Proterozoic or Cambrian volcanogenic massive sulfide deposit.

Deposit model:
Volcanogenic Cu-Fe-Zn massive sulfide deposit (Cox and Singer, model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The Copper City Mine was discovered in 1898 and began production in 1910; it produced intermittently until 1910, when it flooded through a drill hole. It was mined from an inclined, 300-foot shaft with several levels. The deposit was stoped to the surface and the main stope is exposed at the surface for about 300 feet just above the shoreline. In 1992, the deposit was leased to the American Copper and Nickel Company; they drilled one hole about 1,200 feet southwest of the old workings but did not encounter ore.

Production notes:
Total production from 1902 to 1910 was 85 tons of copper, 4,730 ounces of silver, and 341 ounces of gold (Maas and others, 1995).

Reserves:
Probably none.

Additional comments:
The Copper City Mine is on or surrounded by land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Wright and Wright, 1906; Wright, 1908; Wright and Wright, 1908; Knopf, 1911; Brooks, 1912; Brooks, 1913; Brooks, 1915; Wright, 1915; Brooks, 1921; Buddington and Chapin, 1929; Bufvers, 1967; Cobb, 1978; Herreid and others, 1978; Hedderly-Smith, 1990; Hedderly-Smith, 1991 (1990 season); Maas and others, 1991; Roppel, 1991; Hedderly-Smith, 1992 (1991 season); Maas and others, 1995; Hedderly-Smith, 1999 (Inventory); Slack and others, 2002.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Florence; Teresa

Site type: Prospects

ARDF no.: CR161

Latitude: 55.0691 **Quadrangle:** CR A-2

Longitude: 132.6304

Location description and accuracy:
Chapin (1918) reports that two copper claims were staked about a mile north of Lime Point in 1916. There apparently has been no work on them since. They are in the NE1/4 section 32, T. 78 S., R. 85 E.

Commodities:

Main: Cu

Other:

Ore minerals:

Gangue minerals:

Geologic description:
Chapin (1918) reports that two copper claims, Teresa and Florence, were staked north of Lime Point in 1916. No other information is available. The rocks in the area are greenstone, greenschist, phyllite, quartz-sericite schist, and minor marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Two claims were staked in 1916.

Production notes:

Reserves:

Additional comments:
These old prospects and claims are on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:
Chapin, 1918; Cobb, 1978; Eberlein and others, 1983; Brew, 1996.

Primary reference: Chapin, 1918

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (at Lime Point)

Site type: Mine

ARDF no.: CR162

Latitude: 55.0539 **Quadrangle:** CR A-2

Longitude: 132.6341

Location description and accuracy:
This well known locality is at sea level at Lime Point at the southern tip of the peninsula west of Nutkwa Inlet.

Commodities:

Main: Ba

Other:

Ore minerals: Barite

Gangue minerals:

Geologic description:
The Lime Point barite deposit is in a sequence of marble, dolomite, greenstone, and talc schist of the Wales Group of Late Proterozoic and Cambrian age (Chapin, 1916; Herreid and others, 1978; Maas and others, 1991, 1995). The host rocks are cut by several diabase dikes. The deposit consists of a pod of barite 11 to 40 feet wide and about 100 feet long that forms an outcrop that extends 20 to 50 feet above sea level. The ore body strikes north and dips 80W. Pods of barite also are reported to extend south into Nutkwa Inlet. The deposit was found in 1912 and was explored by two short adits. The only production has been a small test shipment in 1915 and possibly several small shipments prior to 1921. It has been sampled several times; no sample showed significant metal values. Most modern workers believe that the barite was deposited in a volcanogenic massive-sulfide environment and is related to such deposits farther north, as, for example, at the Copper City Mine (CR160). Fowler (1948) estimated that the deposit contains 14,286 tons of pure barite; Twenhofel and others (1949) estimated that it contains about 5,000 short tons of barite above the low-tide level.

Alteration:

Age of mineralization:
Probably Late Proterozoic or Cambrian.

Deposit model:
Volcanogenic barite lens.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes

Site Status: Undetermined

Workings/exploration:
The barite lens was developed by two short adits. The deposit has been examined repeatedly in recent years. In 1984, there was considerable flagging in the area (D.J. Grybeck, personal observation).

Production notes:

The only production has been a small test shipment in 1915 and possibly several small shipments prior to 1921.

Reserves:

Fowler (1948) estimated that the deposit contains 14,286 tons of pure barite; Twenhofel and others (1949) estimated that it contains about 5,000 short tons of barite above the low-tide level.

Additional comments:

This property is on or surrounded by land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Brooks, 1915; Chapin, 1916; Smith, 1917 (B 153); Brooks, 1918; Chapin, 1918; Elmendorf, 1920; Smith, 1933 (B 844-A); Fowler, 1948; Twenhofel and others, 1949; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Roppel, 1991; Maas and others, 1995.

Primary reference: Herreid and others, 1978

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Marion; Jack Wilcox

Site type: Mine

ARDF no.: CR163

Latitude: 55.1453 **Quadrangle:** CR A-2

Longitude: 132.4805

Location description and accuracy:
The Marion prospect is at an elevation of about 110 feet, about 0.8 mile west of the mouth of the stream at the head of Nutkwa Lagoon. It is about 0.4 mile southeast of the center of section 32, T. 77 S., R. 86 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Arsenopyrite, chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:
By 1916, the Marion prospect had been explored by a 400-foot adit with a 50-foot winze about 190 feet from the portal (Chapin, 1916). Roehm (1939 [PE 119-18]) called it the Jack Wilcox prospect, and it was restaked in 1944 (Twenhofel and others, 1949). Wolff and Heiner (1971) indicate that the property has produced about 50 ounces of gold, 3 ounces of silver, and 36 pounds of lead.
The rocks in the vicinity are greenschist of the Wales Group of Late Proterozoic and Cambrian age. The adit follows a calcite-bearing quartz vein up to 6 feet thick that is along a shear zone that strikes N20-30W and dips 80W (Herreid and others, 1978). The vein contains small amounts of arsenopyrite, chalcopyrite, galena, pyrite, and sphalerite. Roehm (1939 [PE 119-18]) collected 21 samples across the mineralized zone that averaged 0.06 ounce of gold per ton, and 0.66 ounce of silver per ton; the highest value was 0.66 ounce of gold per ton. As described by Roehm, the mineralized zone is 3 to 12 feet wide and extends for 3,000 feet to an elevation of about 1,000 feet. Maas and others (1991) could not locate the workings under a landslide and recent logging. However, they identified several thin, mineralized fault zones on the surface nearby. A sample from a 4-inch quartz vein in the footwall of a 11-foot-wide fault zone contained 3,828 parts per million (ppm) gold, 12.6 ppm silver, and 5,590 ppm zinc.

Alteration:
None specifically noted, but the mineralized quartz vein occurs along a shear zone.

Age of mineralization:

Deposit model:
Sulfide-bearing gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes

Site Status: Probably inactive

Workings/exploration:

By 1916, the Marion prospect had been explored by a 400-foot adit with a 50-foot winze about 190 feet from the portal (Chapin, 1916). Roehm (1939 [PE 119-18]) called it the Jack Wilcox prospect, and it was restaked in 1944 (Twenhofel and others, 1949).

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1916; Smith, 1933 (B 836); Smith, 1933 (B 844-A); Roehm, 1939 (PE 119-18); Twenhofel and others, 1949; Wolff and Heiner, 1971; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Roehm, 1939 (PE 119-18)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Moonshine

Site type: Mine

ARDF no.: CR164

Latitude: 55.1749 **Quadrangle:** CR A-2

Longitude: 132.3837

Location description and accuracy:
The Moonshine Mine is at an elevation of about 2,600 feet on the ridge west of the South Arm of Cholmondeley Sound. It is about 0.2 mile north of elevation 2580 and about 0.3 mile south of the center of section 24, T. 77 S., R. 86 E.

Commodities:

Main: Ag, Cu, Pb, Zn

Other:

Ore minerals: Anglesite, cerussite, chalcopyrite, covellite, galena, polybasite, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:
The Moonshine Mine was first staked in 1905 and was worked intermittently from 1906 to 1924 (Wright and Wright, 1908; Herreid and others, 1978; Roppel, 1991; Maas and others, 1991, 1995). The initial workings were a 90-foot shaft, a glory hole, and a 200-foot adit. Sometime between between 1921 and 1924, a 1,600-foot tunnel was driven to undercut the ore body, but it apparently was misaligned and did not cut mineralization. There were also several surface trenches. There may have been a small shipment of ore in 1907 and one or more small shipments in 1916.

The rocks in the vicinity of the Moonshine Mine are marble and greenschist of the Wales Group of Late Proterozoic and Cambrian age; they generally strike east-west and dip steeply north (Wright and Wright, 1908; Herreid and others, 1978). The metamorphic rocks are cut by numerous diabase dikes, 1 to 6 feet thick. The deposit is a well-defined, sulfide-bearing quartz vein, 2 to 4 feet thick, that strikes about N65W and has a near-vertical dip (Wright and Wright, 1908; Herreid and others 1978; Maas and others, 1991, 1995). The vein is along a shear zone that separates marble from greenschist; most workers believe that the sulfides replaced the carbonate in the shear zone. The vein contains scattered masses and pods of sulfides. The gangue is calcite and quartz, and the sulfides are mainly galena and sphalerite, with minor pyrite and chalcopyrite. The galena contains microscopic blebs of polybasite and covellite. The shear zone is marked by wallrock dolomitization and by quartz veinlets that extend into the wallrock. Much of the galena float at the workings is encrusted with a thick rind of cerussite and anglesite (D.J. Grybeck, unpublished field notes, 1985). The underground workings in the ore zone are largely inaccessible, but high-grade samples from surface dumps have often been assayed. Maas and others (1991), for example, collected samples of 'high-grade' from the glory hole that contained up to 4,668 parts per million (ppm) silver, 74.74 percent lead, and 3.51 percent zinc. Selected samples of galena collected by Donald Grybeck (unpublished data, 1985) contained 10 to 1,000 ppm silver, 200 to 500 ppm copper, 500 to 1,000 ppm antimony, 1,000 ppm to more than 1 percent zinc, major lead, and less than 0.05 ppm gold.

Alteration:
The shear zone is marked by wallrock dolomitization and by quartz veinlets that extend into the wallrock.

Age of mineralization:
The vein cuts Late Proterozoic or Cambrian host rock.

Deposit model:
Ag-Pb-Zn mineralization along shear zone in metamorphic rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes

Site Status: Probably inactive

Workings/exploration:
The Moonshine Mine was first staked in 1905 and was worked intermittently from 1906 to 1924 (Wright and Wright, 1908; Herreid and others, 1978; Roppel, 1991; Maas and others, 1991, 1995). The initial workings were a 90-foot shaft , a glory hole, and a 200-foot adit. Sometime between between 1921 and 1924, a 1,600-foot tunnel was driven to undercut the ore body but it apparently was misaligned and did not cut mineralization. There were also several surface trenches and pits.

Production notes:
There may have been a small ore shipment in 1907 and one or more other small shipments in 1916.

Reserves:
None.

Additional comments:

References:
Brooks, 1902; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Knopf, 1911; Brooks, 1912; Brooks, 1913; Chapin, 1916; Brooks, 1923; Brooks and Capps, 1924; Buddington and Chapin, 1929; Roberts, 1949; Bufvers, 1967; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Roppel, 1991; Maas and others, 1995.

Primary reference: Herreid and others, 1978; Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hope (west of South Arm Cholmondeley Sound)

Site type: Prospect

ARDF no.: CR165

Latitude: 55.1680 **Quadrangle:** CR A-2

Longitude: 132.3811

Location description and accuracy:
The Hope prospect is at an elevation of about 2,400 feet, about 0.3 mile south-southeast of elevation 2580. It is about in the center of the NE1/4 section 25, T. 77 S., R 86 E., and about 0.4 mile southeast of the better known and geologically similar Moonshine Mine (CR164).

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Cerussite, chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:
The deposit at the Hope prospect is geologically similar to the one at the Moonshine Mine (CR164), about 0.4 mile to the northwest. The rocks in the vicinity of the Hope prospect are greenschist and marble of the Wales Group of Late Proterozoic and Cambrian age (Brew, 1996). The deposit is in folded marble. Prior to World War I, it was explored by a 25-foot adit, a 20-foot inclined shaft, and several trenches. As described by Wright and Wright (1906), the Hope prospect is a vein 1 to 10 feet thick that trends N65E. The marble hostrock is replaced by sphalerite and galena with low silver values. Minor garnet and epidote are also associated with the ore, and cerussite occurs locally as an oxidization product of galena. As described by Herreid and others (1978) and by Maas and others (1991, 1995), the deposit consists of veins and pods of quartz and calcite with galena, sphalerite, and minor chalcopyrite and pyrite that replace marble along numerous shear zones. The best showing examined by Maas and others (1991) was a 3-foot-thick pod of galena and sphalerite exposed in the adit. Samples contained up to 4.16 ounces of silver per ton, 8.71 percent lead, and 17.53 percent zinc. A high-grade galena-rich sample from a trench contained 28.23 percent zinc, 24.49 percent lead, and 4.21 ounces of silver per ton.

Alteration:
Some garnet and epidote reportedly are associated with this lead-zinc replacement deposit in marble.

Age of mineralization:
Replacement deposit whose age is known no more closely than that it is in Late Proterozoic or Cambrian host rock.

Deposit model:
Silver-zinc-lead replacement deposit in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The deposit was explored prior to World War I by a 25-foot adit, a 20-foot inclined shaft, and several trenches.

Production notes:

Minor at best.

Reserves:

None.

Additional comments:

References:

Wright and Wright, 1906; Chapin, 1916; Buddington and Chapin, 1929; Herreid and others, 1978; Cobb, 1978; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north of Nutkwa Point)

Site type: Prospect

ARDF no.: CR166

Latitude: 55.0801 **Quadrangle:** CR A-2

Longitude: 132.5527

Location description and accuracy:
This is an old prospect that seems to have been overlooked in the literature until recently. The only published location for it lacks precision but it is probably within a half mile of a site near sea level, about 1.0 mile northeast of Nutkwa Point, in the north half of section 26, T. 78 S., R. 85 E.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals:

Geologic description:
In 1993, American Copper and Nickel Company (ACNC) rediscovered this old prospect, which consists of a 70-foot adit and a prospect pit (Hedderly-Smith, 1999 [Inventory]). Samples across 2 feet of mineralized rock in the old workings contained 25 percent zinc, 2.6 percent copper, 0.6 percent lead, 1.29 ounce of silver per ton, and 0.10 ounce of gold per ton. After they located the old workings, ACNC mapped the geology of the area, carried out soil sampling and shallow geophysical surveys, and drilled five holes. The deposit is a massive-sulfide horizon that strikes N25E and dips 5-15SE; it varies from less than inch to over three feet thick, and has an average thickness of 1 to 2 feet over a strike length of 1,200 feet. The grade of the horizon averages 20-27 percent zinc, about 1 percent copper, 0.7 to 5 ounces of silver per ton, and 0.007 to 0.4 ounce of gold per ton. ACNC continued to work in the area in 1994 and 1995 and explored the extension of the mineralization into section 24. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age; they consist of greenstone, greenschist, phyllite, quartz-sericite schist, and minor marble (Eberlein and others, 1983; Brew, 1996).

Alteration:
The alteration is probably similar to that associated with typical volcanogenic massive-sulfide mineralization.

Age of mineralization:
Probably coeval with the deposition of the Late Proterozoic or Cambrian host rocks.

Deposit model:
Volcanogenic massive-sulfide deposit (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The old workings include an adit and a prospect pit. American Copper and Nickel Company did considerable work in the area from 1993 to 1995. It included geologic mapping and soil and geophysical surveys, and they drilled 5 holes.

Production notes:

Reserves:

Additional comments:

This old prospect is on land that has been conveyed to the Sealaska Corporation, who hold the surface and subsurface rights, or the land is under application for transfer to them.

References:

Eberlein and others, 1983; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Keete Inlet)

Site type: Prospect

ARDF no.: CR167

Latitude: 55.0812 **Quadrangle:** CR A-2

Longitude: 132.4890

Location description and accuracy:

This prospect consists of a flooded shaft just above tidewater, about 0.3 mile south-southwest of the west head of Keete Inlet. It is about 0.4 mile northwest of the center of section 29, T. 78 S., R. 86 E.

Commodities:

Main: Cu

Other:

Ore minerals: Bornite?, chalcopyrite, pyrite

Gangue minerals:

Geologic description:

Chapin (1916) originally described this deposit as a 'shear zone' with chalcopyrite, pyrite, and possibly bornite. The only working is a (shallow?) shaft that was flooded in 1915. Maas and others (1991, 1995) describe the deposit as a 1- to 2-foot-thick, copper-bearing, massive sulfide layer between altered chlorite schist and sericite schist of the Wales Group of Late Proterozoic and Cambrian age (Herreid and others, 1978). The sulfides also are disseminated in the wall rock. A 1.1-foot sample near the old shaft contained 1.23 parts per million (ppm) gold, 10.7 ppm silver, and 0.29 percent copper (Maas and others, 1991). There is no record of production. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age.

Alteration:

Unspecified alteration of schist host rocks.

Age of mineralization:

Probably contemporaneous with deposition of the Late Proterozoic or Cambrian host rocks.

Deposit model:

Volcanogenic massive sulfide (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

28a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The only working is a shaft sunk before 1916.

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1916; Cobb, 1978; Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995; Slack and others, 2002.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hozer

Site type: Prospects

ARDF no.: CR168

Latitude: 55.0420 **Quadrangle:** CR A-2

Longitude: 132.5416

Location description and accuracy:

The Hozer prospect is on a small creek at an elevation of about 200 feet. It is about 0.8 mile southeast of Keete Point and about 0.3 mile east-northeast of the southwest corner of section 1, T. 79 S., R 85 E.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Pyrite, sphalerite

Gangue minerals:

Geologic description:

In a search for massive-sulfide deposits in the area during the 1980's, industry staked a group of claims on a sequence of metatuffs with minor quartz veining, brecciated greenstone, and metabasite. Maas and others (1991) identified disseminated and stringer pyrite and sphalerite in greenstone breccia. A sample of it contained 0.302 part per million (ppm) gold, 1.6 ppm silver, 987 ppm copper, and 0.77 percent zinc. A chip sample across 30 feet contained 0.116 ppm gold, 0.6 ppm silver, 428 ppm copper, and 418 ppm zinc. A float boulder of quartz-chlorite schist with up to 60 percent pyrite contained 0.336 ppm gold and 1.3 ppm silver. The rocks in the vicinity are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid and others, 1978).

Alteration:

Age of mineralization:

Probably contemporaneous with deposition of the Late Proterozoic or Cambrian host rocks.

Deposit model:

Volcanogenic massive-sulfide deposit (Singer and Cox, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

28a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Apparently only surface sampling.

Production notes:

Reserves:

Additional comments:

References:

Herreid and others, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Polymetal; Ruby Tuesday; Research; Chomly; Ketchikan Copper Company

Site type: Prospects

ARDF no.: CR169

Latitude: 55.2157 **Quadrangle:** CR A-1

Longitude: 132.3248

Location description and accuracy:

This property was staked prior to 1902 by the Ketchikan Copper Company and it is so named in several old reports. A 297-foot adit was driven under the mineralization and the ARDF site is at that adit. The adit is at an elevation of about 1,300 feet, about 2.5 miles southwest of the mouth of the South Arm of Cholmondeley Sound, and near the southwest corner of section 4, T. 77 S., R. 87 E. After WW II, the property was restaked several times by several parties, and there was considerable exploration in the 1980's and early 1990's, when the property consisted of more than 70 claims. Most of the work was in an area about 1,800 feet in diameter centered near the location of the original claims.

Commodities:

Main: Ag, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

This property was staked before 1902 (Brooks, 1902) by the Ketchikan Copper Company and it is so named in the early reports. A tunnel was driven for about 300 feet to intersect the ore body at depth, but apparently stopped short of it. The deposit was restaked as the Polymetal Lode in 1948 and was explored by one or more shallow drillholes in the mid-50's (Maas and others, 1991, 1995). It was restaked in 1973 and drilled by ASARCO under lease. Noranda restaked a large area around it in 1978 and 1979 as the Ruby Tuesday claim block. LAC Minerals (USA) Incorporated gained a controlling interest in the property in 1988 and brought in Kennecott Exploration as a partner in 1993. There were at least 11 holes totaling more than 7,300 feet drilled on the property through early 1993 (LAC Minerals (USA) Incorporated, 1989). There has been no production and no reserve figures have been published.

The rocks in the area consist of intricately folded and faulted, greenschist-grade, chlorite schist, sericite schist, marble, siliceous and graphitic pelitic rocks, felsic tuff, and undivided pelitic and volcaniclastic rocks (Herreid and others, 1978; Kucinski, 1987; Maas and others, 1991, 1995). The rocks are part of the Wales Group of Late Proterozoic and Cambrian age. The main deposit, the Polymetal, is a stratiform volcanogenic massive-sulfide deposit that consists of thin stringers and layers of sphalerite, pyrite, galena, and chalcopyrite in siliceous felsic tuff near its contact with black argillaceous chert. Recent detailed geochemical and isotopic work by Slack and others (2002) confirm that the deposit is of Late Proterozoic or Cambrian age. Fowler (1949) sampled the outcrop of a 20-foot-thick mineralized zone; it averages 11.1 percent zinc, 3.1 percent lead, and a trace of silver. The nearby Chomly deposit is in a different stratigraphic horizon; it consists of patches of sphalerite and galena up to 4 inches thick and 3 feet long in black argillaceous chert.

Alteration:

Intense alteration was noted in one report but was not described specifically. The mineralized zone is oxidized and iron stained at the surface.

Age of mineralization:
Contemporaneous with the deposition the Late Proterozoic or Cambrian host rocks.

Deposit model:
Volcanogenic Cu-Pb-Zn massive sulfide deposit (Cox and Singer, 1986; model 28a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
28a

Production Status: None

Site Status: Undetermined

Workings/exploration:
This property was staked before 1902 (Brooks, 1902) by the Ketchikan Copper Company and it is so named in the early reports. A tunnel was driven for about 300 feet to intersect the ore body at depth but apparently stopped short of it. The deposit was restaked as the Polymetal Lode in 1948 and was explored by one or more shallow drillholes in the mid-50's (Maas and others, 1991, 1995). It was restaked in 1973 and drilled by ASARCO under lease. Noranda restaked a large area around it in 1978 and 1979 as the Ruby Tuesday claim block. LAC Minerals (USA) Incorporated gained a controlling interest in the property in 1988 and brought in Kennecott Exploration as a partner in 1993. There were at least 11 holes totaling more than 7,300 feet drilled on the property through early 1993 (LAC Minerals (USA) Incorporated, 1989).

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Fowler, 1949; Berg and Cobb, 1967; Herreid and others, 1978; Eakins and others, 1985; Bundtzen and others, 1986; Bundtzen and others, 1987; Kucinski, 1987; Bundtzen and others, 1988; Green and others, 1989; LAC Minerals USA Incorporated, 1989; Bundtzen and others, 1990; Swainbank, Bundtzen, and Wood, 1991; Maas and others, 1991; Maas and others, 1995; Slack and others, 2002.

Primary reference: Kucinski, 1987

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Friendship

Site type: Prospect

ARDF no.: CR170

Latitude: 55.2181 **Quadrangle:** CR A-1

Longitude: 132.3138

Location description and accuracy:

The Friendship prospect is just above the shoreline on the west side of the South Arm of Cholmondeley Sound, about 2.4 miles southwest of its mouth. It is about 0.4 mile south-southwest of the center of section 4, T. 77 S., R. 87 E. The Friendship prospect is sometimes described together with the Ruby Tuesday prospect (CR169) about 0.4 mile to the west.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Azurite, chalcopyrite, malachite

Gangue minerals: Calcite, quartz

Geologic description:

The Friendship prospect has been known since before 1902 (Brooks, 1902) but little work has been done on it since then. The workings consist of a flooded pit and a shaft about 15 feet deep (Maas and others, 1991). The rocks in the vicinity consist of marble and greenschist of the Wales Group of Late Proterozoic and Cambrian age (Herreid and others, 1978). As described by Maas and others (1991), the deposit consists of a quartz-calcite vein 1.1 to 3.8 feet thick, with chalcopyrite, azurite, and malachite. One wall of the vein is marble, the other is felsic schist. The vein is along a shear zone that strikes N20-30E and has a steep dip. Seven samples contained 2,574 parts per million (ppm) to 0.456 ounce of gold per ton, and several contained more than 2 percent copper. The highest gold value in a 3.6-foot sample of the vein was 0.456 ounce per ton; the highest copper value in a 1-foot sample was 3.91 percent. There was negligible silver, lead, or zinc.

Alteration:

Age of mineralization:

Deposit model:

Calcite-quartz vein with copper minerals.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The workings consist of a flooded pit and a shaft about 15 feet deep.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1906; Cobb, 1978; Herreid and others, 1978; Kucinski, 1987; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north end of Divide Head)

Site type: Occurrence

ARDF no.: CR171

Latitude: 55.2409 **Quadrangle:** CR A-1

Longitude: 132.2450

Location description and accuracy:

This occurrence is at the north end of Divide Head about 0.7 mile southwest of Sunny Point; it is about 0.4 mile north-northeast of the center of section 31, T. 76 S., R. 87 E.

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

A 2- to 5-inch-thick quartz vein(?) with pyrite and chalcopyrite is along a suspected shear zone. The vein is conformable to the bedding of the limestone host rock, which is part of the Wales Group of Late Proterozoic and Cambrian age (Hedderly-Smith, 1999 [Inventory]). A sample contained 4.97 percent copper, 5.4 parts per million silver, and 119 parts per billion gold.

Alteration:

Age of mineralization:

Deposit model:

Quartz vein(?) with chalcopyrite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only limited surface sampling.

Production notes:

Reserves:

Additional comments:

References:

Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (at head of Dora Bay)

Site type: Occurrences

ARDF no.: CR172

Latitude: 55.1683 **Quadrangle:** CR A-1

Longitude: 132.2439

Location description and accuracy:

This site is near the center of an area about two miles long and 2,000 feet wide that extends south along the valley from the head of Dora Bay. The site is about 0.6 mile northwest of the center of section 25, T. 77 S., R. 87 E.

Commodities:

Main: Nb, REE, Y

Other:

Ore minerals: Bastnaesite, eudialyte, euxenite, monazite, thalenite, zircon

Gangue minerals: Amphibole, feldspar, pyroxene, quartz

Geologic description:

Yttrium- and rare-earth-element (REE)-bearing pegmatites and pegmatitic dikes occur at numerous localities over a distance of about two miles from the the head of Dora Bay to Dora Lake (Barker and Mardock, 1990). The pegmatites and dikes are peripheral to a Jurassic syenite stock at the head of Dora Bay (Brew, 1996). The stock was formerly thought to intrude rocks of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983), but recent work indicates that the rocks are part of a previously unidentified Silurian and Ordovician unit of heterogeneous, low-grade metamorphic rocks that are less deformed than those of the Wales Group (S.M. Karl, written communication, 2003).

The deposits closest to the stock are coarse-grained pegmatite dikes deposited from late-stage fluids; with increasing distance, they grade into 'vein dikes,' and ultimately into silica-rich veins. The pegmatite dikes are up to 13 feet thick and consist mainly of quartz and albite with minor riebeckite, aegirine, and zircon. They commonly have a halo of pyritic and chloritic alteration. The vein dikes generally are1 to 3 feet thick, have a pegmatitic core, contain banded quartz, and feature hydrothermal sericite, rhodochrosite, galena, and sphalerite. The silica-rich veins are usually less than 1 foot thick and often are extensions of the vein dikes; the veins typically are manganese-oxide-stained and more radioactive that the other dikes. There is a pronounced element zoning in the dikes marked by increase in lithophile elements with increasing distance from the pluton. The REE minerals are primarily thalenite and bastnaesite with lesser monazite, euxenite, and eudialyte (which contains most of the niobium). About half of the rare earths are the heavy REE subgroup.

Barker and Mardock (1990) calculated the resources in two occurrences. They estimate that a vein dike about 3 feet thick near Dora Lake contains an inferred resource of about 500,000 tons of material with 442 parts per million (ppm) niobium, 71 ppm uranium, 1,775 ppm yttrium, 1.53 percent zirconium, and 2,816 ppm REE. Another block near the south end of Dora Lake is projected to have a strike length of 4,000 feet and a vertical extent of 2,000 feet. Assuming a thickness of 1.5 to 10 feet, this body has an estimated resource of 1.2 to 8.0 million tons of material that contains 340 ppm niobium, 27 ppm uranium, 1,969 ppm yttrium, 1.08 percent zirconium, and 3,647 ppm REE. Of this, 2.4 million tons is inferred.

Hedderly-Smith (1999 [Inventory]) sampled the pegmatites, dikes, and veins around the syenite stock. None that he examined approaches ore grade for yttrium, REE, or zirconium. He describes two principal phases of late-stage mineralization: 1) feldspar-amphibole(-pyroxene) pegmatites; and 2) quartz-feldspar-manganese(-eudialyte) veins. There is also a nepheline syenite phase with bands of eudialyte. Electron probe studies indicate that the yttrium and rare-earth elements are not in the eudialyte but in some other (unspecified) silicate(s).

Alteration:

The deposits closest to the stock are coarse-grained pegmatite dikes deposited from late-stage fluids; with increasing distance, they grade into 'vein dikes,' and ultimately into silica-rich veins. The pegmatite dikes are up to 13 feet thick and consist mainly of quartz and albite with minor riebeckite, aegirine, and zircon. They commonly have a halo of pyritic and chloritic alteration. The vein dikes generally are 1 to 3 feet thick, have a pegmatitic core, contain banded quartz, and feature hydrothermal sericite, rhodochrosite, galena, and sphalerite. The silica-rich veins are usually less than 1 foot thick and often are extensions of the vein dikes; the veins typically are manganese-oxide-stained and more radioactive that the other dikes. There is a pronounced element zoning in the dikes marked by increase in lithophile elements with increasing distance from the pluton.

Age of mineralization:

Genetically and spatially related to the Jurassic syenite stock at the head of Dora Bay.

Deposit model:

REE-bearing pegmatites and dikes peripheral to a syenite pluton.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:

None beyond extensive sampling by government and private geologists. (The area was logged in the 1980's and considerable outcrop was exposed or blasted out along the many logging roads.)

Production notes:

Reserves:

Barker and Mardock (1990) calculated the resources in two occurrences. They estimate that a vein dike about 3 feet thick near Dora Lake contains an inferred resource of about 500,000 tons of material with 442 parts per million (ppm) niobium, 71 ppm uranium, 1,775 ppm yttrium, 1.53 percent zirconium, and 2,816 ppm REE. Another block near the south end of Dora Lake is projected to have a strike length of 4,000 feet and a vertical extent of 2,000 feet. Assuming a thickness of 1.5 to10 feet, this body has an estimated resource of 1.2 to 8.0 million tons of material that contains 340 ppm niobium, 27 ppm uranium, 1,969 ppm yttrium, 1.08 percent zirconium, and 3,647 ppm REE. Of this, 2.4 million tons is inferred. Hedderly-Smith (1999 [Inventory]) sampled the dikes and veins around the syenite pluton; none that he examined approaches ore grade for yttrium, rare earth elements, or zirconium.

Additional comments:

References:

Eberlein and others, 1983; Barker and Mardock, 1990; Maas and others, 1992; Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Philpotts and others, 1993; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Barker and Mardock, 1990; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lady of the Lake; Lucky Boy; North Vein; Complex; Frisco; Idaho; Minnetonka; Oregon; Portland; Seattle

Site type: Prospect

ARDF no.: CR173

Latitude: 55.1576 **Quadrangle:** CR A-1

Longitude: 132.2360

Location description and accuracy:

The workings at the Lady of the Lake prospect extend from the shore of upper Dora Lake to an elevation of about 330 feet. They are about 0.3 mile northeast of the southern tip of the lake and about 0.5 mile south of the center of section 25, T. 77 S, R. 87 E. Several authors combine their descriptions of this prospect with the Lucky Boy propect (CR174), about 0.4 mile to the southwest. For example, Roppel (1991), who focuses on the personalities and early history of the properties, describes both prospects under the name 'Complex' (which was the name of a short-lived post office and one of the many names for the claim groups that covered both prospects). Robinson and Twenhofel (1953) call the prospect at this site the 'Lucky Boy North deposit,' and the Lucky Boy prospect, the 'Lucky Boy South deposit.' Maas and others (1991) follow Robinson and Twenhofel's nomenclature, whereas Maas and others (1995) call this site the Lady of the Lake prospect and the one to the south the Lucky Boy prospect, as does ARDF. Robinson and Twenhofel (1953) provide a detailed map of the prospect.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The Lady of the Lake prospect was discovered prior to 1902 (Brooks, 1902). It has been described several times in the older literature, sometimes in combination with the Lucky Boy prospect (CR174), sometimes as a distinct prospect, and sometimes as being on various claim blocks (Wright and Wright, 1906, 1908; Smith, 1914; Chapin, 1916; Buddington and Chapin, 1929; Roehm 1939 [PE 119-16]; Townsend, 1945; Twenhofel, 1953). Robinson and Twenhofel (1953) provide a detailed map and description of the prospect (under the name 'Lucky Boy North deposit'). The deposit consists of three breccia veins in black, calcareous argillite, schist, and marble. The breccias are composed of rock fragments cemented by quartz and calcite that are 'slightly mineralized' with sphalerite, galena, pyrite, and chalcopyrite. Until recently, the host rocks were considered to be part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). More recent mapping, however, indicates that they are previously unrecognized Silurian and Ordovician metamorphic rocks that are less deformed than those of the Wales Group (S. M. Karl, oral communication, 2003).

The lowest vein at the Lady of the Lake prospect strikes N10W and dips 70W; it is exposed for about 160 feet along the shore of Dora Lake and it about 18 inches thick. A sample across it contained 3.80 percent zinc and 0.36 percent lead. Two veins are at an elevation of about 330 feet. One of them is 7 feet thick and is exposed for about 150 feet; it strikes N35W and dips 70SW. The other is exposed for about 85 feet and is about 5 feet thick in a 65-foot adit that cuts it in the subsurface; it strikes north and dips 80W. A select sample from the dump of one of the upper veins contained 5.23 percent zinc, 2.05 percent lead, and minor silver and gold. Maas and others (1991) collected a representative 15-foot sample across one of the quartz- and calcite-cemented breccias. It contained 2.065 parts per million (ppm) gold, 4,316 ppm lead, and 1.35

percent zinc. Selected samples contained up to 0.331 ounce of gold per ton, 12.8 ppm silver, 0.97 percent lead, and 2.44 percent zinc.

The workings consist of several trenches and a 65-foot adit on the upper workings. There is no record of production. Houston Oil and Minerals Corporation sampled and possibly drilled the Lady of the Lake prospect in the late 1970's and 1980's, during their exploration of other deposits in the area. Robinson and Twenhofel (1953) estimate that the deposit contains about 7,000 tons of material with about 0.33 percent zinc, 1 percent lead, and minor silver and gold.

Alteration:

Age of mineralization:
Only that it is younger than the Silurian or Ordovician host rocks.

Deposit model:
Polymetallic mineralized breccia along a shear zone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings consist of several trenches and a 65-foot adit on the upper veins. Houston Oil and Minerals Corporation sampled and possibly drilled the Lady of the Lake prospect in the late 1970's and 1980's, during their exploration of other deposits in the area.

Production notes:
There is no record of production.

Reserves:
Robinson and Twenhofel (1953) estimated that the deposit contains about 7,000 tons of material with about 0.33 percent zinc, 1 percent lead, and minor silver and gold.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1906; Wright and Wright, 1908; Smith, 1914; Chapin, 1916; Martin, 1919; Buddington and Chapin, 1929; Roehm, 1939 (PE 119-16); Townsend, 1945; Twenhofel, 1953; Robinson and Twenhofel, 1953; Eberlein and others, 1983; Maas and others, 1991; Roppel, 1991; Hedderly-Smith, 1991 (1990 season); Hedderly-Smith, 1992 (1991 season); Hedderly-Smith, 1993 (1992 season); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Robinson and Twenhofel, 1953

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lucky Boy; Complex; Frisco; Idaho; Minnetonka; Oregon; Portland; Seattle

Site type: Mine

ARDF no.: CR174

Latitude: 55.1539 **Quadrangle:** CR A-1

Longitude: 132.2423

Location description and accuracy:

The Lucky Boy prospect is about 0.2 mile south of the south end of Dora Lake and about 0.4 mile northwest of the center of section 36, T. 77 S., R. 87 E. Several authors combine their descriptions of this prospect with the Lady of the Lake prospect (CR173), about 0.4 mile to the northeast. For example, Roppel (1991), who focuses on the personalities and early history of the properties, describes both prospects under the name 'Complex' (which was the name of a short-lived post office and one of the many names for the claim groups that covered both prospects). Robinson and Twenhofel (1953) call the Lady of the Lake prospect the 'Lucky Boy North deposit,' and the Lucky Boy prospect, the 'Lucky Boy South deposit.' Maas and others (1991) follow Robinson and Twenhofel's nomenclature, whereas Maas and others (1995) call this site the Lucky Boy prospect and the one to the north the Lady of the Lake prospect, as does ARDF. Robinson and Twenhofel (1953) and Maas and others (1995) provide maps of the workings at the Lucky Boy prospect.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

It is unclear when the Lucky Boy prospect as defined in this record was named, because in its early history it was often not distinguished from the nearby and similar Lady of the Lake prospect (CR173), which was discovered prior to 1902 (Brooks, 1902). It was known as the Lucky Boy prospect by 1933 or 1934 (Roehm, 1939 [PE 119-16]; Townsend, 1945; Robinson and Twenhofel, 1953). Before then, the deposit had been staked as part of the Complex claim group and still earlier it was described by Wright and Wright (1908) as on the Oregon and Idaho claims. By 1939, the workings included two adits, about 180 feet of crosscut, 120 feet of drift, a raise, and two small stopes (Maas and others, 1991, 1995). A small mill was built on the property in about 1916 (Roppel, 1991). There was at least one test shipment in about 1915 that was carried by aerial tram south to Miller Lake (called Mineral Lake in early reports), but there is no record that the mill actually produced concentrates. In the late 1970's and early 1980's, Houston Oil and Minerals Corporation completed several diamond drill holes on the property.

The rocks in the vicinity of the deposit consist of black, calcareous argillite, greenschist, and marble along a regional fault that strikes south from Dora Lake; the fault marks the contact between what Eberlein and others (1983) called the Wales Group of Late Proterozoic and Cambrian age and the Descon Formation of Silurian and Ordovician age (Eberlein and others, 1983). More recent mapping, however, indicates that they are previously unrecognized Silurian and Ordovician metamorphic rocks that are less deformed than those of the Wales Group (S.M. Karl, oral communication, 2003).

The deposit at the Lucky Boy prospect is along a shear zone up to 8 feet wide that strikes N22E and dips 35E (Roehm, 1939 [PE 119-6]; Twenhofel, 1943; Townsend, 1945; Robinson and Twenhofel, 1953; Maas and others, 1991,1995; Hedderly-Smith, 1999 [Inventory]). The shear zone is oblique to the foliation of the host rocks and is filled with rock fragments (breccia) cemented by quartz and calcite. The breccia contains several percent of sphalerite, galena, pyrite, and chalcopyrite. The shear zone can be traced for about 380 feet in surface pits and is exposed in the underground workings where it notably leaner than at the surface. The mineralization has been sampled many times with varying results, depending on the selection of the samples (Roehm, 1939 [PE 1996-6]; Townsend, 1945; Robinson and Twenhofel, 1953). Mass and others (1991, 1995) collected samples in the trenches and underground. Their higher grade samples contained 84 to 6,017 parts per billion gold, up to 40.8 parts per million (ppm) silver, 0.47 to 0.77 percent lead, 0.32 to 1.18 percent copper, and 8.92 to 20.35 percent zinc. Robinson and Twenhofel (1953) estimated that the deposit contains about 1,500 tons of material with an average grade of about 3 percent zinc.

The deposit as now exposed is an epigenetic mineralized breccia along a shear zone. However, Houston Oil and Minerals Corporation, who drilled the prospect in the late 1970's and early 1980's, did so to test the theory that the mineralization in the shear zone is remobilized from an as yet undiscovered, stratiform volcanogenic massive-sulfide deposit (Douglas Oliver, oral communication, 1983).

Alteration:

Age of mineralization:

Only that it is younger than the Silurian or Ordovician host rocks.

Deposit model:

Polymetallic mineralized breccia along a shear zone.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Yes

Site Status: Undetermined

Workings/exploration:

It is unclear when the Lucky Boy prospect as defined in this record was named, because in its early history it was often not distinguished from the nearby and similar Lady of the Lake prospect (CR173), which was discovered prior to 1902 (Brooks, 1902). It was known as the Lucky Boy prospect by 1933 or 1934 (Roehm, 1939 [PE 119-16]; Townsend, 1945; Robinson and Twenhofel, 1953). Before then, the deposit had been staked as part of the Complex claim group and still earlier it was described by Wright and Wright (1908) as on the Oregon and Idaho claims. By 1939, the workings included two adits, about 180 feet of crosscut, 120 feet of drift, a raise, and two small stopes (Maas and others, 1991, 1995). A small mill was built on the property in about 1916 (Roppel, 1991). There was at least one test shipment in about 1915 that was carried by aerial tram south to Miller Lake (called Mineral Lake in early reports), but there is no record that the mill actually produced concentrates. In the late 1970's and early 1980's, Houston Oil and Minerals Corporation completed several diamond drill holes on the property.

Production notes:

There was at least one test shipment in about 1915 that was carried south by an aerial tram to Miller (Mineral) Lake, but there is no record that the small mill actually produced concentrates.

Reserves:

Twenhofel (1953) estimated that the deposit contains about 1,500 tons of material with about 3 percent zinc.

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1906; Wright and Wright, 1908; Smith, 1914; Chapin, 1916; Martin, 1919; Buddington and Chapin, 1929; Roehm, 1939 (PE 119-16); Townsend, 1945; Twenhofel, 1953; Robinson and Twenhofel, 1953; Eberlein and others, 1983; Maas and others, 1991; Roppel, 1991; Maas

and others, 1992; Maas and others, 1995.

Primary reference: Robinson and Twenhofel, 1953

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (south of Dora Lake)

Site type: Occurrence

ARDF no.: CR175

Latitude: 55.1552 **Quadrangle:** CR A-1

Longitude: 132.2504

Location description and accuracy:

This occurrence is in a borrow pit about 0.4 mile west-southwest of the southern tip of Dora Lake; it is about 0.6 mile northeast of the center of section 35, T. 77 S., R. 87 E.

Commodities:

Main: Ag, Au, Pb, Zn

Other:

Ore minerals: Galena, pyrite

Gangue minerals:

Geologic description:

In a borrow pit at this site, Maas and others (1991) identified mineralization similar to that at the Lucky Boy Mine (CR174), about 0.5 mile to the east. The pit exposes calcareous metasedimentary rocks and greenstone that contain stratiform quartz-calcite-sulfide veins and stringers. On older maps, these rocks were considered to be part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). More recent mapping, however, indicates that they are previously unrecognized Silurian and Ordovician metamorphic rocks that are less deformed than those of the Wales Group (S.M. Karl, oral communication, 2003).

The prospect also includes a breccia zone about 5 feet thick that consists of rock fragments cemented by quartz and calcite with pyrite, sphalerite, and galena (Maas and others, 1991). A representative sample across the breccia contained 1,065 parts per billion (ppb) gold and 4,311 parts per million (ppm) zinc. A selected sample of sulfide-rich rock contained 6,797 ppb gold, 23.5 ppm silver, 3,210 ppm lead, and 8.87 percent zinc.

Alteration:

Age of mineralization:

The stratiform sulfide-bearing veins may represent Silurian or Ordovician massive-sulfide-type mineralization. The sulfide-bearing breccia is epigenetic and younger.

Deposit model:

Breccia zone with sulfides; possible massive-sulfide-type mineralization in the host rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only surface sampling in a borrow pit.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Cymru

Site type: Mine

ARDF no.: CR176

Latitude: 55.1337 **Quadrangle:** CR A-1

Longitude: 132.1975

Location description and accuracy:
The Cymru Mine is just north of the southeast end of Miller Lake (called Mineral Lake in early reports). It is about 0.5 mile west-southwest of the center of section 5, T. 78 S., R. 88 E. Maas and others (1995) provide a detailed map of the surface and underground workings.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:
The Cymru Mine was found in 1899 and by 1900, a 30-foot tunnel had been driven on the deposit (Brooks, 1902; Wright, 1908; Wright and Wright, 1908; Chapin, 1916; Bufvers, 1967; Roppel, 1991; Maas and others, 1991, 1995). By 1906, a substantial camp had been built at the property and the first ore was shipped via a 4,200-foot tram to a dock on Clarno Cove. A fire destroyed most of the facilities in 1907; the plant was quickly rebuilt but the property soon had financial difficulties. A new company was established to operate the property in 1914; considerable work was done, but only a small amount of ore was shipped in 1916. There has been no production since then and by 1928, the buildings and tramway had largely been overgrown or had collapsed. The deposit was developed by two short adits, several shafts, and about 400 feet of underground workings. They connected to several stopes that extended from the surface to the deepest workings at a depth of about 30 feet.

The rocks in the vicinity of the mine are Late Proterozoic or Cambrian marble and greenschist of the Wales Group (Eberlein and others, 1983; Brew, 1996). The deposit at the mine is usually described as a conformable quartz-calcite vein up to 6 feet thick in marble interbedded with calcareous greenschist (Wright and Wright, 1908; Maas and others, 1991, 1995). More likely it is a folded, stratiform layer in the host rocks (D.J. Grybeck personal observation, 1983). The mineralization consists of disseminations and sulfide-rich bands of chalcopyrite and pyrite. The deposit can be traced for about 1,200 feet on the surface and in underground workings. The deposit and the host rocks strike about N55W and dip 70SW. Maas and others (1991) collected 26 samples, many underground in the old workings. The best values were from a portion of the ore body about 4.3 feet thick that averaged 3.98 percent copper. The silver content varies with the copper content; the highest silver value was 9.06 ounces per ton. The highest gold value was 0.21 parts per million (ppm), the highest zinc value was 436 ppm, and the highest lead value was 45 ppm. The Cymru Mine produced 141,700 pounds of copper, 1,417 ounces of silver, and 28.34 ounces of gold in 1916, and 9,570 pounds of copper and 69 ounces of silver in 1915 (Maas and others, 1991,1995).

Alteration:

Age of mineralization:
Unclear whether this is an epigenetic deposit or a folded, copper-rich, stratiform layer in the Late Proterozoic or Cambrian host rocks.

Deposit model:
A layer or vein of sulfide-bearing calcite and quartz in marble and greenschist.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status: Undetermined

Workings/exploration:
The Cymru Mine was found in 1899 and by 1900, a 30-foot tunnel had been driven on the deposit (Brooks, 1902; Wright, 1908; Wright and Wright, 1908; Chapin, 1916; Bufvers, 1967; Roppel, 1991; Maas and others, 1991, 1995). By 1906, a substantial camp had been built at the property and the first ore was shipped via a 4,200-foot tram to a dock on Clarno Cove. A fire destroyed most of the facilities in 1907; the plant was quickly rebuilt, but the property soon had financial difficulties. A new company was established to operate the property in 1914; considerable work was done, but only a small amount of ore was shipped in 1916. There has been no production since then and by 1928, the buildings and tramway had largely been overgrown or had collapsed. The deposit was developed by two short adits, several shafts, and about 400 feet of underground workings. They connected to several stopes that extended from the surface to the deepest workings at a depth of about 30 feet.

Production notes:
The Cymru Mine produced 141,700 pounds of copper, 1,417 ounces of silver, and 28.34 ounces of gold in 1916, and 9,570 pounds of copper and 69 ounces of silver in 1915 (Maas and others, 1991, 1995).

Reserves:

Additional comments:

References:
Brooks, 1902; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1915; Chapin, 1916; Brooks, 1921; Berg and Cobb, 1967; Bufvers, 1967; Eberlein and others, 1983; Maas and others, 1991; Roppel, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Maas and others, 1991; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): San Juan

Site type: Prospect

ARDF no.: CR177

Latitude: 55.1507 **Quadrangle:** CR A-1

Longitude: 132.1818

Location description and accuracy:
The San Juan prospect is east of the head of Kitkun Bay at an elevation of about 400 feet. It is 1.0 mile west-southwest of hill 1305 and about 0.1 mile northeast of the center of section 32, T. 77 S., R. 88 E.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
The San Juan prospect was discovered prior to 1902 and was explored intermittently until 1913 (Brooks, 1902; Wright and Wright, 1908; Smith, 1914). The rocks in the vicinity consist of greenschist and marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). Maas and others (1991) describe a tunnel 320 feet long and another 20 feet long, neither of which exposes ore. A higher adit, 165 feet long, cuts a fault zone up to 10 feet thick with fragments of gouge, sericite schist, quartz-schist-marble breccia, and quartz, all with varying amounts of pyrite. Samples from the fault zone contained 16 to 860 parts per billion gold; a dump sample of milky quartz contained 6.68 parts per million gold. Based on a grid of soil samples, Hedderly-Smith (1999 [Inventory]) defined a stratabound epithermal breccia deposit as much as 4 feet thick that can be traced for over 700 feet. Based on numerous chip samples, he estimated that the average grade is less than 0.03 to 0.1 ounce of gold per ton.

Alteration:

Age of mineralization:
The deposit is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (breccia) (Cox and Signer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings consist of a 20 foot and a 320-foot tunnel, neither of which cuts mineralization. A 165-foot tunnel cuts a mineralized fault zone. There was considerable sampling by government and private geologists in the the late 1980's and 1990's.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Hedderly-Smith, 1993 (1992 Brennan Bay-Kitkun); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1996 (Kitkun); Hedderly, 1997 (Kitkun); Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Croesus

Site type: Prospect

ARDF no.: CR178

Latitude: 55.1532 **Quadrangle:** CR A-1

Longitude: 132.1758

Location description and accuracy:

The Croesus prospect is east of the head of Kitkun Bay at an elevation of about 900 feet. It is 0.3 mile west of hill 1305 and about 0.5 mile east-northeast of the center of section 32, T. 77 S., R. 88 E.

Commodities:

Main: Au

Other:

Ore minerals:

Gangue minerals: Quartz?

Geologic description:

The Croesus prospect was discovered prior to 1902 and by 1908, two tunnels, one 350 feet long and the other 135 feet long, had been driven on a quartz vein that strikes north and dips 85E (Brooks, 1902; Wright and Wright, 1908; Maas and others, 1991). The workings also include a 20-foot adit, a caved shaft, and at least one trench. Some rich ore was found but the ore streaks are small and faulted (Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Bufvers, 1967). The rocks in the vicinity consist of greenschist and marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). Apparently, there was no further exploration work after 1913. Maas and others (1991) collected 22 samples. Their highest gold value was 0.624 ounce per ton across 5.2 feet; there were a considerable number of assays above 0.3 ounce of gold per ton, but the other metal values were uniformly low. Based on extensive soil sampling, Hedderly-Smith (1999 [Inventory]) suggests that the veins may extend for about 1,000 feet along strike and that the mineralization is probably more extensive than previously recognized.

Alteration:

Age of mineralization:

Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

One vein was explored by a 135-foot tunnel and a 350-foot tunnel. The workings also include a 20-foot adit, a caved shaft, and at least one trench. Sampled by government and industry geologists in the late

1980's.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Hedderly-Smith, 1993 (1992 Brennan Bay-Kitkun); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1996 (Kitkun); Hedderly, 1997 (Kitkun); Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Oregon; Washington; Hula Hula

Site type: Prospects

ARDF no.: CR179

Latitude: 55.1687 **Quadrangle:** CR A-1

Longitude: 132.1496

Location description and accuracy:
The Oregon and Washington prospects are east of central Kitkun Bay at an elevation of about 200 feet. They are about 0.9 mile north-northwest of hill 1328 and about 0.6 mile northeast of the center of section 28, T. 77 S., R. 88 E. The Hula Hula prospect of Bufvers (1967) may be the Washington or Oregon prospect or the Kid prospect (CR180).

Commodities:

Main: Au

Other: Ag, Cu, Zn

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
These old prospects, which have been variously named, were discovered in 1900, but are only mentioned in passing after 1908 (Brooks, 1902; Wright and Wright, 1908). The host rocks are chlorite schist and marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). Brooks (1902) described the Oregon prospect as a pyrite-bearing quartz vein at the contact of chlorite schist in the hanging wall and and marble in the footwall. A sample assayed $4.80 (probably in gold at $20.67 per ounce). Wright and Wright (1908) described the Oregon prospect/claim as a 3-foot quartz vein that crosscuts chlorite schist and contains pyrite, chalcopyrite, sphalerite, and minor values in gold and silver. They describe the Washington prospect as a 10-foot band of brecciated limestone and schist that strikes N45E. The limestone is cut by quartz stringers and veinlets with minor sulfides. The only workings are several open cuts and there is no record of production.

Alteration:

Age of mineralization:
The veins are younger than the Late Proterozoic or Cambrian host rock.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only workings are open cuts dug before 1908.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Bufvers, 1967; Eberlein and others, 1983; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1993 (1992 Brennan Bay-Kitkun); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Kid; Fawn

Site type: Prospects

ARDF no.: CR180

Latitude: 55.1680 **Quadrangle:** CR A-1

Longitude: 132.1422

Location description and accuracy:
The Kid or Fawn prospect is at an elevation of about 800 feet, about 0.9 mile north of hill 1328 and 0.4 mile northwest of the center of section 27, T. 77 S., R. 88 E.

Commodities:

Main: Au

Other: Cu, Pb, Zn

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:
This old prospect, which has been called either Kid or Fawn, was known prior to 1902, but has been mentioned only in passing since 1908 (Brooks, 1902; Wright and Wright, 1908). As described by Brooks (1902) under the name Fawn, the deposit consists of a vertical quartz vein that strikes N40W, is 6 feet thick, and is in chlorite schist. The vein contains pyrite and galena; a sample contained 1.2 ounce of gold per ton. A similar vein nearby is 4 to 5 feet thick and is less mineralized. As described by Wright and Wright (1908), the prospect consists of 3 parallel calcite-quartz veins up to 8 feet thick. Metal values are low. The host rocks are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The workings consist of open cuts and a 30-foot adit.

Alteration:

Age of mineralization:
Younger than the Late Proterozoic or Cambrian host rock.

Deposit model:
Low sulfide, gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only workings are open cuts and a 30-foot adit driven before 1908.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Alameda; Tomboy

Site type: Prospect

ARDF no.: CR181

Latitude: 55.1685 **Quadrangle:** CR A-1

Longitude: 132.1284

Location description and accuracy:
The Alameda or Tomboy prospect is southeast of Kitkun Bay at an elevation of about 300 feet. It is about 1.0 mile north-northwest of hill 2221 and near the center of the NE1/4 section 27, T. 77 S., R. 88 E.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
As described by Brooks (1902) as part of the Tomboy Group, this deposit is a series of quartz veins that form topographic knolls and were reported by the owner to have been traced for about 3,000 feet. The veins are bounded on one side by marble and on the other by chlorite schist. Most of the quartz appears to be barren; some contains pyrite. Wright and Wright (1908) note that one of the claims was restaked as the Alameda, and describe the deposit as a quartz vein about 4 feet wide that strikes north and dips 50E. The vein has low gold values. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). No workings are reported.

Alteration:

Age of mineralization:
Younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low sulfide, gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
No workings are reported.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Frisco

Site type: Prospect

ARDF no.: CR182

Latitude: 55.1633 **Quadrangle:** CR A-1

Longitude: 132.1280

Location description and accuracy:
The Frisco prospect is southeast of Kitkun Bay at an elevation of about 1,000 feet. It is about 0.8 mile north-northwest of hill 2221 and about 0.3 mile east-southeast of the center of section 27, T. 77 S., R. 88 E.

Commodities:

Main: Au

Other:

Ore minerals: Pyrite

Gangue minerals: Quartz

Geologic description:
As described by Wright and Wright (1908), the Frisco prospect was originally part of the Tomboy group of claims (CR181) that was subsequently restaked. The deposit is a quartz vein 12 feet wide that strikes north. The vein contains pyrite and fragments of the chlorite schist and marble host rocks. The vein assayed only a few dollars in gold. A 30-foot vein nearby was too lean to mine. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low sulfide, gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
None noted.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Eberlein and others, 1983; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Kitkun Bay)

Site type: Occurrence

ARDF no.: CR183

Latitude: 55.1895 **Quadrangle:** CR A-1

Longitude: 132.1162

Location description and accuracy:
This occurrence is in outcrops along a logging road about 0.3 mile northeast of Kitkun Bay. It is in the SW1/4 section 14, T. 77 S., R. 88 E.

Commodities:

Main:

Other: Au, Cu

Ore minerals: Pyrite

Gangue minerals:

Geologic description:
As described by Hedderly-Smith (1999 [Inventory]), this occurrence is an outcrop of quartz-chlorite-sericite schist (meta-rhyolite?) 10 to 15 feet thick that contains 5-20 percent pyrite. His samples contained up to 265 parts per million copper and 193 parts per billion gold. Most of the rock in the area is felsic chlorite schist that is part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:
Younger than or contemporaneous with the Late Proterozoic or Cambrian host rocks.

Deposit model:
Gold and copper in quartz-chlorite-sericite-pyrite schist.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only sampling by industry geologist.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Hedderly-Smith, 1993 (1992 Brennan Bay-Kitkun); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Equator; Saco

Site type: Prospects

ARDF no.: CR184

Latitude: 55.2299 **Quadrangle:** CR A-1

Longitude: 132.0625

Location description and accuracy:
The Equator and Saco prospects are adjacent to each other. The adit at the Equator prospect is at an elevation of about 350 feet, the Saco adit is at an elevation of about 200 feet. The prospects are about 2.1 miles east of the north end of Hump Island, near the southeast corner of section 32, T 76 S., R. 88 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
As described by Wright and Wright (1908), the main working on the Equator prospect is a 50-foot adit at an elevation of about 350 feet. The deposit consists of a quartz vein enclosing masses of limestone country rock. The vein strikes N60W and dips 50SW, parallel to the strike of the host rocks, but with a slightly different dip. The vein contains chalcopyrite and pyrite, with gold values. On the Saco prospect, a 50-foot adit is at an elevation of about 200 feet. A vein that strikes east-west varies from 4 feet thick at the portal to 2 inches thick at the face. The host rock is talc schist that strikes north and dips vertically. The vein contains pyrite and chalcopyrite, with gold values. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Maas and others (1992) collected a 4-inch[?] chip sample across the vein in the Saco adit that contained 1,441 parts per million (ppm) copper, 0.6 ppm silver, and less than 5 parts per billion (ppb) gold. Hedderly-Smith (1999 [Inventory]) collected a representative sample of the dump of the Saco adit that contained 2.4 percent copper, 0.7 ppm silver, and 4 ppb gold. Maas and others (1991,1992) and Hedderly-Smith (1999 [Inventory]) consider the deposit at the Equator prospect to be a mineralized breccia similar to the copper-gold deposits along the Kael-7 Mile Trend (CR188); the deposit at the adjacent Saco prospect is probably an epigenetic quartz vein.

Alteration:
The mineralized fault zone at the Equator prospect is probably similar to the breccia deposits in the Kael-7 Mile Trend (CR188). If so, it is probably marked by silicification and dolomitization of the rock fragments in the breccia and of the country rock.

Age of mineralization:
Younger than the Late Proterozoic or Cambrian country rock.

Deposit model:
The Equator prospect is probably a stratiform Au-Cu breccia zone in marble; the adjacent Saco deposit is probably a Au-Cu quartz vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
The Equator and Saco prospects were explored by 50-foot adits prior to 1908 and were sampled by government and industry geologists in the 1990's.

Production notes:

Reserves:

Additional comments:

References:
Wright and Wright, 1908; Cobb, 1978; Eberlein and others, 1983; Hedderly-Smith, 1990; Maas and others, 1991; Maas and others, 1992; Hedderly-Smith, 1992 (Kael-Dolomi); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Gladstone

Site type: Prospect

ARDF no.: CR185

Latitude: 55.2254 **Quadrangle:** CR A-1

Longitude: 132.0705

Location description and accuracy:

The Gladstone property extends over 4 claims. The site is at the northern workings at an elevation of about 150 feet. It is about 0.7 mile east of triangulation station Lancaster and about 0.5 mile west-northwest of the center of section 6, T. 77 S., R. 89 E. The property extends for about a half mile south-southwest to an open cut at an elevation of about 400 feet.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:

As originally described by Wright and Wright (1908), the Gladstone deposit consists of several brecciated quartz-calcite veins up to 6 feet thick, exposed over a distance of about a half mile. The veins contain pyrite and chalcopyrite; the host rock is mainly marble with schist layers that is part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The property extended over four claims and included a tunnel and several open cuts. The deposit was examined by Maas and others (1991) and by Hedderly-Smith (1999 [Inventory]), who reinterpreted it as conformable gold- and copper-bearing breccia zones in carbonate rocks similar to deposits to the south in the Kael-7 Mile Trend (CR188). Maas and others (1991) examined the Gladstone adit, where a 10-foot-wide shear zone is exposed that contains quartz-marble breccia. The shear zone is up to 20 feet wide at the surface. Nine chip samples contained 19 to 190 parts per billion (ppb) gold and 1,742 parts per million (ppm) to 2.05 percent copper. A sample collected by Hedderly-Smith (1999 [Inventory]) across a 6-foot mineralized zone with about 5 percent pyrite and chalcopyrite contained 7,669 ppm copper and 11 ppb Au.

Alteration:

If this deposit is similar to those in the Kael-7 Mile Trend (CR188), it is associated with silicification and dolomitization of the marble host rock.

Age of mineralization:

Younger than the Late Proterozoic or Cambrian host rock.

Deposit model:

Probably a stratiform Au-Cu breccia zone in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Workings consists of a short adit and several open cuts over a distance of at least 0.5 mile.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1906; Wright and Wright, 1908; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1992; Hedderly-Smith, 1992 (Kael-Dolomi); Hedderly-Smith, 1993 (1992 season); Hedderly-Smith, 1993 (1993 Brennan Bay-Kitkun); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Kael Pit

Site type: Prospect

ARDF no.: CR186

Latitude: 55.1993 **Quadrangle:** CR A-1

Longitude: 132.0671

Location description and accuracy:

This deposit is probably the initial discovery in a mineralized belt called the 'Kael-7 Mile Trend' (CR188). The deposit was first described by Hedderly-Smith (1999 [Inventory]), although he does not specifically use the name Kael Pit in his description. 'Kael Pit' is the name applied by Maas and others (1991, 1995) to a borrow pit along a Forest Service road, about 0.5 mile northwest of the center of section 18, T. 77 S., R. 89 E. This site is near, or the same as, the old Park View prospect (CR187).

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

The Kael Pit deposit is one of several in a mineral belt called the Kael-7 Mile Trend (CR188). The rocks in the area consist mainly of marble with minor chlorite schist, cut by greenstone dikes and sills. The metamorphic rocks are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The mineralization is stratiform and and consists of breccia veins or zones (Hedderly-Smith, 1999 [Inventory]). The clasts in the breccia vary from fresh marble to ferroan(?) dolomite to silicified marble. The matrix is mainly quartz; locally the matrix contains up to 50 percent pyrite and chalcopyrite, but generally contains only a few percent of sulfides.

The mineralization in the Kael Trend was discovered in 1988 by a Sealaska geologist. The discovery, presumably at or near this site, was soon leased to the American Copper and Nickel Company, who mapped and sampled the the mineralization along the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. Three holes totaling 2,837 feet were drilled in 1994: one at the Roy Creek prospect (CR191) at the east end of the belt; and two at the west end, one or both of which may be at or near or the Kael pit.

As described by Maas and others (1991,1995), the Kael Pit deposit consists of two silicified marble-breccia zones 15 feet thick separated by 50 feet of marble with interbedded greenstone. The breccia zones contain clots of pyrite and chalcopyrite. Samples 1.2 to 9.5 feet long contained 12 to 1,938 parts per billion gold and 23 to 2,800 parts per million (ppm) copper. A sample of massive pyrite contained 0.360 ounce of gold per ton and 4,809 ppm copper.

Alteration:

Marble is silicified and dolomitized in the mineralized breccia zones.

Age of mineralization:

Vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Stratiform Au-Cu breccia zones in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:

This site is in a belt of mineralization about 4 miles long and 0.5 mile wide that is called the Kael-7 Mile Trend (CR188). The mineralization was discovered in 1988 by a Sealaska geologist. The property was soon leased to the American Copper and Nickel Company, who mapped and sampled the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. Three holes totaling 2,837 feet were drilled in 1994: one at the Roy Creek prospect (CR191) at the east end of the belt, and two at the west end, one or both of which may be at or near the Kael pit.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Park View

Site type: Prospect

ARDF no.: CR187

Latitude: 55.2004 **Quadrangle:** CR A-1

Longitude: 132.0536

Location description and accuracy:

Hedderly-Smith (1999 [Inventory]) suggests that the most likely location of the old Park View prospect is in the NE1/4 of section 18 or the SW1/4 of section 8, T. 77 S., R. 89 E. For this record, the site is at about the center of that area, about 0.5 mile north-northeast of the center of section 18. Maas and others (1991), however, suggest that the Park View may be near the Kael Pit (CR186). If so, the prospect may be a mile or more from the location used in this record.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Calcite, quartz

Geologic description:

As originally described by Wright and Wright (1908), the Park View deposit consists of a 5-foot-thick mineralized zone parallel to the foliation of the schist host rocks. The deposit strikes about N75W and consists of lenses and stringers of quartz and calcite. Pyrite and chalcopyrite are disseminated in the lenses and stringers and also in the wallrock. The only workings were an open cut and an 8-foot-deep pit. The mineralization was considered to be low grade. The Park View prospect has not been found in recent years in spite of considerable work in the area.

The Park View prospect is within the Kael-7 Mile Trend (CR188), and probably is similar to other deposits in it. The rocks in the area consist mainly of marble with minor chlorite schist, cut by greenstone dikes and sills. The metamorphic rocks are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The mineralization is stratiform and consists of breccia veins or zones (Hedderly-Smith, 1993, 1999 [Inventory]). The clasts of the breccia vary from fresh marble to ferroan(?) dolomite to silicified marble. The matrix is mainly quartz; locally the matrix contains up to 50 percent pyrite and chalcopyrite, but it generally contains only a few percent of sulfides.

Alteration:

Not specifically noted in the old and only published description of the deposit (Wright and Wright, 1908). If the alteration is similar to that at the other deposits along the Kael-7 Mile Trend (CR188), it consists of silicification and dolomitization of the marble host rocks.

Age of mineralization:

Deposit is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Stratiform, gold- and copper-bearing breccia zones in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:
The only workings when it was described in 1908 were an open cut and an 8-foot-deep pit.

Production notes:

Reserves:

Additional comments:

References:
Wright and Wright, 1908; Eberlein and others, 1983; Maas and others, 1991; Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1993 (Dolomi-Chasna); Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908; Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Kael-7 Mile Trend

Site type: Prospects

ARDF no.: CR188

Latitude: 55.2003 **Quadrangle:** CR A-1

Longitude: 132.0479

Location description and accuracy:

This site represents the Kael-7 Mile Trend, a belt of similar geology and mineral deposits about 0.5 mile wide and 4 miles long. The center of the belt is at the southwest corner of section 8, T. 77 S., R. 89 E. The belt includes the Kael Pit (CR186), O.K. (CR189), 7 Mile Gold (CR190), and Roy Creek (CR191) prospects.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

This site represents a belt of mineralization about 4 miles long and 0.5 mile wide. It includes several prospects (CR186 and CR188-191), but the mineralization and its geochemical expression occur throughout the belt. The mineralization was discovered in 1988 by a Sealaska geologist. That discovery (CR 186) was soon leased to the American Copper and Nickel Company, who mapped and sampled the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. Three holes totaling 2,837 feet were drilled in 1994, one at the Roy Creek prospect (CR191) at the east end of the belt, and two at the west end.

The rocks in the area consist mainly of marble and minor chlorite schist, cut by greenstone dikes and sills. They are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The mineralization is stratiform and and consists of breccia veins or zones (Hedderly-Smith, 1993, 1999 [Inventory]). The clasts in the breccia vary from fresh marble to ferroan(?) dolomite to silicified marble. The matrix is mainly quartz; locally the matrix may contain up to 50 percent pyrite and chalcopyrite, but it generally contains only a few percent of sulfides. Assays of drill core vary from insignificant values to 11.9 feet of material that averages 0.127 ounce of gold per ton. This intercept includes 1.4 feet that grades 0.635 ounce of gold per ton and 3 feet that grades 0.207 ounce of gold per ton. Hedderly-Smith (1993) suggests that the mineralization is the result of remobilization of volcanogenic massive sulfide deposits, possibly driven by the intrusion of a nearby granitic pluton.

Alteration:

Marble is silicified and dolomitized in the mineralized breccia zones.

Age of mineralization:

Vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Stratiform Au-Cu breccia zones in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:

This site represents a belt of mineralization about 4 miles long and 0.5 mile wide. It includes several prospects (CR186 and CR188-191), but the mineralization and its geochemical expression occur throughout the belt. The mineralization was discovered in 1988 by a Sealaska geologist. That discovery (CR 186) was soon leased to the American Copper and Nickel Company, who mapped and sampled the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. Three holes totaling 2,837 feet were drilled in 1994, one at the Roy Creek prospect (CR191) at the east end of the belt, and two at the west end.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Hedderly-Smith, 1989; Hedderly-Smith, 1990; Maas and others, 1991; Hedderly-Smith, 1992 (Kael-Dolomi); Hedderly-Smith, 1993 (1992 season); Maas and others, 1995; Hedderly-Smith, 1995 (Kael-Dolomi); Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): O.K.

Site type: Prospect

ARDF no.: CR189

Latitude: 55.1975 **Quadrangle:** CR A-1

Longitude: 132.0304

Location description and accuracy:
The location of the O.K. prospect is based solely on small-scale map in Wright and Wright (1908). It probably is within 0.5 mile of the center of the NE1/4 section 17, T. 77 S., R. 89 E.

Commodities:

Main: Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
As described by Wright and Wright (1908), the O.K. prospect is a quartz vein 3 to 4 feet thick that strikes N75W; it contains chalcopyrite, pyrite, sphalerite, galena, and gold. Little work had been done on it then and apparently it has not been described since. The vein is at the contact between schist and limestone of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew 1996). Hedderly-Smith (1999 [Inventory]) suggests that the deposit may be similar to the quartz-breccia mineralization along the Kael-7 Mile Trend (CR188), as the prospect is well within that mineralized belt.

Alteration:

Age of mineralization:

Deposit model:
Quartz vein with sulfides and gold.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Little work had been done on this prospect in 1908 and apparently there has been none since.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Cobb, 1978; Eberlein and others, 1983; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): 7-mile Gold

Site type: Prospect

ARDF no.: CR190

Latitude: 55.1994 **Quadrangle:** CR A-1

Longitude: 132.0251

Location description and accuracy:
The 7-Mile Gold prospect, which is exposed in road cuts and a borrow pit, is about 0.8 mile southeast of hill 1360, and near the northeast corner of section 17, T. 77 S., R. 89 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
The 7-Mile Gold prospect is one of the deposits in the Kael-7 Mile Trend (CR188), a belt of mineralization about 4 miles long and 0.5 mile wide. The rocks in the area consist mainly of marble and minor chlorite schist, cut by greenstone dikes and sills. They are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The mineralization is stratiform and and consists of breccia veins or zones (Hedderly-Smith, 1993, 1999 [Inventory]). The clasts in the breccia vary from fresh marble to ferroan(?) dolomite to silicified marble. The matrix is mainly quartz; locally the matrix may contain up to 50 percent pyrite and chalcopyrite but it generally contains only a few percent of sulfides.
The mineralization in the Kael-7 Mile Trend was discovered in 1988 by a Sealaska geologist. The discovery (CR 186) was soon leased to the American Copper and Nickel Company, who mapped and sampled the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. At least one hole was drilled on the 7-Mile Gold prospect. Three holes totaling 2,837 feet were drilled in 1994, one at the Roy Creek prospect (CR191) at the east end of the belt, and two at the west end.
As described by Maas and others (1991), the deposit at this prospect is a 30-foot-thick, silicified marble-breccia zone with masses and blebs of pyrite and chalcopyrite. The zone trends N55-80E. The mineralization is exposed in road cuts and a borrow pit, but the best mineralization is in large blocks of sulfide-rich marble in rubble in the cuts and on the pit floor. Maas and others (1991) collected several sets of samples: 1) 4 samples, 6 to10 feet long, of the footwall and hanging wall of the mineralized zone contained 18 to 165 parts per billion (ppb) gold and 17 to 154 parts per million (ppm) copper; 2) 7 samples, 2 to 8 feet long, of the silicified breccia contained 105 to 566 ppb gold and 11 to 182 ppm copper; and 3) 2 sulfide-rich samples of rubble in the pit contained 0.388 and 0.784 ounce of gold per ton, 5.5 and 14.5 ppm silver, and 1.0 and 2.18 percent copper.

Alteration:
Silicification and dolomitization of marble.

Age of mineralization:
Younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Stratiform Au-Cu breccia zones in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:

Extensive sampling of mineralized road cuts and a borrow pit by government and industry geologists. At least one shallow hole drilled in 1990. Maas and others (1991) collected several sets of samples: 1) 4 samples, 6 to10 feet long, of the footwall and hanging wall of the mineralized zone contained 18 to 165 parts per billion (ppb) gold and 17 to 154 parts per million (ppm) copper; 2) 7 samples, 2 to 8 feet long, of the silicified breccia contained 105 to 566 ppb gold and 11 to 182 ppm copper; and 3) 2 sulfide-rich samples of rubble in the pit contained 0.388 and 0.784 ounce of gold per ton, 5.5 and 14.5 ppm silver, and 1.0 and 2.18 percent copper.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Brew, 1996; Maas and others, 1991; Hedderly-Smith, 1993 (Dolomi-Chasna); Maas and others, 1995; Hedderly-Smith, 1996 (Kitkun); Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Roy Creek

Site type: Prospect

ARDF no.: CR191

Latitude: 55.2017

Quadrangle: CR A-1

Longitude: 132.0167

Location description and accuracy:

The Roy Creek prospect is exposed along road cuts about a mile south of Halibut Creek and about 0.6 mile southwest of hill 980. It is about 0.5 mile southwest of the center of section 9, T. 77 S., R. 89 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

The Roy Creek prospect is one of the deposits in the Kael-7 Mile Trend (CR188), a belt of mineralization about 4 miles long and 0.5 mile wide. The rocks in the area consist mainly of marble and minor chlorite schist, cut by greenstone dikes and sills. They are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The mineralization is stratiform and and consists of breccia veins or zones (Hedderly-Smith, 1993, 1999 [Inventory]). The clasts in the breccia vary from fresh marble to ferroan(?) dolomite to silicified marble. The matrix is mainly quartz; locally the matrix may contain up to 50 percent pyrite and chalcopyrite, but it generally contains only a few percent of sulfides.

The mineralization in the Kael-7 Mile Trend was discovered in 1988 by a Sealaska geologist. The discovery (CR 186) was soon leased to the American Copper and Nickel Company, who mapped and sampled the belt, and drilled 26 shallow holes in 1990 and 1991, mainly on geochemical anomalies. Three holes totaling 2,837 feet were drilled in 1994, one at the Roy Creek prospect at the east end of the belt, and two at the west end. The drill hole at the Roy Creek prospect did not cut mineralization better than that at the surface.

Hedderly-Smith (1999 [Inventory]) originally described the deposit at the Roy Creek prospect as two quartz veins that strike about N50W and dip vertically. They are in road cuts about 1,000 feet apart. The veins, one 2 to 3 inches thick and the other 4 to 6 inches thick, contain pyrite and chalcopyrite; the host rock is chlorite-quartz greenschist. Later work indicated that there is only one vein that was sampled in two places. Four samples contained 0.4 to 74 parts per million (ppm) silver, 0.847 to 27.8 ppm gold, and 6.0 to 8.1 percent copper.

The prospect was also sampled by Maas and others (1991), who describe it as a quartz-pyrite-chalcopyrite vein exposed for about 15 feet in a roadcut. The vein cuts chlorite-quartz schist that strikes N65E and dips 67NW. It is about 0.1 to 0.2 feet thick, strikes about N20-40W, and dips 78N to vertical. Two samples contained 1.379 and 4.506 ounces of gold per ton, 11.5 and 17.6 ounces of silver per ton, and 2.24 and 4.80 percent copper. About 500 feet to the east, a similar quartz-stringer zone is exposed in a roadcut. A 3.7-foot-long sample contained 695 parts per billion gold and 242 ppm copper.

Alteration:

Marble is silicified and dolomitized in the mineralized breccia zones.

Age of mineralization:

Younger than the Late Proterozoic or Cambrian host rock.

Deposit model:
Au-Cu quartz vein or stratiform Au-Cu breccia zones in marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active?

Workings/exploration:
Extensive surface sampling by government and industry geologists. One hole was drilled in 1994. Hedderly-Smith (1999 [Inventory]) collected four samples that contained 0.4 to 74 parts per million (ppm) silver, 0.847 to 27.8 ppm gold, and 6.0 to 8.1 percent copper. Maas and others (1991) collected two samples that contained 1.379 and 4.506 ounces of gold per ton, 11.5 and 17.6 ounces of silver per ton, and 2.24 and 4.80 percent copper. They also collected a 3.7-foot-long sample that contained 695 parts per billion gold and 242 ppm copper.

Production notes:

Reserves:

Additional comments:

References:
Eberlein and others, 1983; Hedderly-Smith, 1989; Maas and others, 1991; Hedderly-Smith, 1992 (Kael-Dolomi); Hedderly-Smith, 1993 (1992 season); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (north of French Harbor)

Site type: Occurrences

ARDF no.: CR192

Latitude: 55.1813 **Quadrangle:** CR A-1

Longitude: 132.0159

Location description and accuracy:
This site is about 2 miles north-northeast of French Harbor, about at the center of the NW1/4 section 21, T. 77 S., R. 89 E. It is in the center of a poorly defined mineralized area about a mile wide that trends north for about two miles.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Unspecified sulfide minerals

Gangue minerals:

Geologic description:
Hedderly-Smith (1999 [Inventory]) noted numerous occurrences of sparse, stratabound, massive-sulfide mineralization along logging roads in an area about a mile wide that trends north for about two miles. The occurrences are marked by weak gossans. The rocks in the area are chlorite schist, greenstone, and minor limestone of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). Samples from the gossans, which are typically less than 1 foot thick, contain about 25 parts per billion (ppb) gold and 100 parts per million (ppm) copper. One sample contained 580 ppb gold and 148 ppm copper.

Alteration:
None specifically noted other than development of gossan.

Age of mineralization:
Younger than the Late Proterozoic or Cambrian country rocks.

Deposit model:
Stratabound massive-sulfide layers in schist with small amounts of gold and copper.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:
Only surface sampling by industry along logging rocks.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Hedderly-Smith, 1989; Hedderly-Smith, 1992 (Kael-Dolomi); Hedderly-Smith, 1993 (1992 season); Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near 'Jesse Lake')

Site type: Prospect

ARDF no.: CR193

Latitude: 55.1752 **Quadrangle:** CR A-1

Longitude: 132.0453

Location description and accuracy:

This site includes scattered occurrences of skarn mineralization in the S1/2 of sections 19 and 20, T. 77 S., R. 89 E. They are near a small lake informally called Jesse Lake in the literature. The coordinates are at about the center of the area of occurrences.

Commodities:

Main: Ag, Au, Cu, Pb, Zn

Other:

Ore minerals: Chalcopyrite, hematite, magnetite, pyrite, pyrrhotite, sphalerite

Gangue minerals: Epidote, garnet, quartz

Geologic description:

Sealaska geologists discovered skarn mineralization at this site in 1988 Hedderly-Smith (1999 [Inventory]). The rocks in the area are chlorite schist and greenstone, interbedded with minor limestone, that are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The skarn largely consists of quartz, epidote, garnet, and magnetite, with hematite, pyrite, pyrrhotite, chalcopyrite, and sphalerite. Six of Hedderly-Smith's skarn samples contained up to 6,280 parts per million (ppm) copper, 105 ppm lead, 8,630 ppm zinc, 9.2 ppm silver, and 137 parts per billion (ppb) gold. Maas and others (1991) collected a sample of gossan rubble from a borrow pit in the SW1/4 of section 20 that contained 171 ppm copper, 1.4 ppm silver, and 1,686 ppb gold. A sample of pyrite from a boulder collected about 1,500 feet northwest of Jesse Lake contained 102 ppm copper, 2.9 ppm silver, and 6.243 ppb gold. Hale and others (1992) noted stratiform sulfides in four widely spaced borrow pits in the Jesse Lake area; they suggested that they were replacement deposits in carbonate pods in volcaniclastic sedimentary rocks. Three short drill holes in the mineralized outcrops did not encounter additional mineralization.

Alteration:

Skarns in carbonate rocks.

Age of mineralization:

Younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Au-Cu-Zn skarn; stratiform replacement deposits in carbonate pods.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Mainly surface examination and sampling of outcrops by government and industry geologists. Three short drill holes in the mineralized outcrops did not encounter additional mineralization.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Hedderly-Smith, 1989; Maas and others, 1991; Hale and others, 1992; Hedderly-Smith, 1992 (1991 Season); Maas and others, 1992; Hedderly-Smith, 1993 (Dolomi-Chasna); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Hedderly-Smith, 1999 (Inventory)

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Santa Rosa; Irene; Red Huckleberry

Site type: Prospects

ARDF no.: CR194

Latitude: 55.1467 **Quadrangle:** CR A-1

Longitude: 132.1213

Location description and accuracy:
These prospects are scattered for about a mile along an east-west trend; their midpoint is about 0.4 mile south-southwest of hill 2221 and about 0.5 mile west-southwest of the center of section 35, T. 77 S., R. 88 E.

Commodities:

Main: Au?

Other:

Ore minerals:

Gangue minerals:

Geologic description:
The only evidence for these prospects is that they are shown on an old, small-scale map by Wright and Wright (1908, figure 18). Hedderly-Smith (1999 [Inventory]) refers to them in passing in describing geochemical anomalies in the area. The rocks in the area are schist and marble of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:
Unknown.

Production notes:

Reserves:

Additional comments:

References:
Wright and Wright, 1908; Eberlein and others, 1983; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Washington

Site type: Prospects

ARDF no.: CR195

Latitude: 55.1418 **Quadrangle:** CR A-1

Longitude: 132.1281

Location description and accuracy:

This prospect is at an elevation of about 300 feet, about 0.7 mile west of the west end of Paul Lake. It is about 0.5 mile northeast of the center of section 3, T. 78 S., R. 88 E. The only published location for this prospect is the small map of Wright and Wright (1908, figure 18). It is near what Maas and others (1995) call the 'Paul Lake West' occurrence. This is not the Washington prospect (CR179) about 2.0 miles to the north-northwest.

Commodities:

Main: Au, Pb, Zn

Other:

Ore minerals:

Gangue minerals: Quartz?

Geologic description:

The only reference to this prospect is the small map of Wright and Wright (1908, figure 18). They give no details of the deposit, only that the rocks in the vicinity are marble and chlorite schist of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996). The prospect is near where Maas and others (1995) collected a float sample that contained 24 parts per billion gold, 5,209 parts per million (ppm) lead, and 9,673 ppm zinc.

Alteration:

Age of mineralization:

Indeterminate from the limited information.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

None, other than that it is a prospect known before WW I.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Eberlein and others, 1983; Maas and others, 1995; Brew, 1996.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Matilda; House

Site type: Prospects

ARDF no.: CR196

Latitude: 55.1483 **Quadrangle:** CR A-1

Longitude: 132.0519

Location description and accuracy:

This site is arbitrarily plotted in the middle of James Lake, in the SE 1/4 section 31, T. 77 S., R. 89 E. These prospects were briefly described by Brooks (1902), who did not give good locations, and they have not been described since. The Matilda claim is north of the Fortune (CR 205) claim, which is south of James Lake. The House claim is about a mile north of Dolomi. The Matilda and House claims are probably within 0.5 mile of James Lake.

Commodities:

Main: Au

Other: Cu, Sb

Ore minerals: Chalcopyrite, pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:

The only published descriptions of the Matilda and House claims are by Brooks (1902). The deposit on the Matilda claim is a quartz vein 3 feet thick that strikes east and dips 60S. The vein is in sheared mica schist; it contains pyrite and 'is said to carry gold.' The deposit on the House claim is a quartz vein 1 to 2 feet thick that cuts marble. The vein, which is exposed in a small pit, strikes N15E and dips 30NW; it contains (minor?) pyrite, chalcopyrite, and tetrahedrite. The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

The vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide, brecciated gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

Probably only surface pits.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Cobb, 1978; Herreid, 1967.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Valpariso

Site type: Mine

ARDF no.: CR197

Latitude: 55.1456 **Quadrangle:** CR A-1

Longitude: 132.0793

Location description and accuracy:

The Valpariso Mine is near the north shore of Paul Lake, about 0.4 mile southwest of Dolomi Mountain. It is not at the mine symbol about a half mile to the west on the USGS 1:63,360-scale topographic map. Instead, it is about 0.3 mile south-southeast of the center of section 36, T. 77 S., R. 88 E. The Paul or Jessie prospect (CR200) to the east is probably an extension of the vein at the Valpariso Mine and descriptions of that prospect sometimes have been combined with that of the mine. The underground workings at the mine are shown on figure 30 of Maas and others (1995).

Commodities:

Main: Ag, Au

Other: Cu, Pb, Sb, Zn

Ore minerals: Chalcopyrite, galena, gold, pyrite, sphalerite, tetrahedrite

Gangue minerals: Calcite, quartz

Geologic description:

The Valpariso Mine was the most productive in the Dolomi area and has been described in many publications (for example: Brooks, 1902; Wright and Wright 1905, 1906, 1908; Smith, 1914; Smith, 1934; Dyer, 1952, 1956; Herreid, 1967; Maas and others, 1991, 1995). By 1902, the mine had already been developed by two shafts and one small ore shipment had been made. Development and production took place fairly regularly from 1898 to 1920, and the deposit was mined by a lessor in 1927 and again in 1932. The mine plant was extensively rebuilt in 1935 and again in 1954, but no ore was produced. The workings consisted of two (four?) shafts, the deepest of which was 400 feet deep, and extensive workings on at least three levels. Smith (1934) and Dyer (1952, 1956) reported that the mine produced about 5,000 ounces of gold to 1933. U.S. Bureau of Mines records document the production of about 730 ounces of gold and 521 ounces of silver from 1914 to 1933 (Maas and others, 1991, 1995). In 1983 and 1984, Houston Oil and Mineral Exploration Corporation drilled 21 holes at the mine and at the Paul Lake (CR200), Amazon (CR209), and Boston (CR207) properties (Oliver and Adams, 1984).

The country rocks at the Valpariso MIne are marble and schist of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983). The deposit consists of a vein up to 14 feet thick of quartz, quartz breccia, and quartz-marble breccia with calcite; the vein is locally faulted and the marble is extensively silicified. The vein is conformable to the bedding of a thick marble layer. In an adit about 600 feet west of the mill, the marble is in contact with chlorite schist and quartzite or jasperoid. The vein strikes about N55W and dips 30-70N; it can be traced for as much as 6,000 feet to the east, to and beyond the Paul or Jessie prospect (CR200). The vein typically contains about 1 percent ore minerals, including free gold, tetrahedrite, pyrite, chalcopyrite, galena, and sphalerite. Some of the ore was very rich; some ore mined in early 1900's ran $200-$250 a ton in gold (at $20.67 an ounce) and silver (Brooks, 1902). Samples of veins and old dumps collected in 1934 ran $5.50 to $42.07 a ton in gold (at $35 per ounce) and silver (Smith, 1934). In 1934, after the last mining, Smith estimated that the deposit contained 22,500 tons of probable ore in place with an average grade of 0.28 ounce of gold per ton and minor silver. Maas and others (1991) collected 34 samples in the underground workings. Their gold values varied greatly; the best was 4.660 ounces of gold per ton across 1.2 feet, but most samples contained much less. The highest silver value was 6.18

ounces of silver per ton.

Alteration:
The vein is locally faulted and the marble is extensively silicified.

Age of mineralization:
The vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide, brecciated gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Active?

Workings/exploration:
The workings consisted of two (four?) shafts, the deepest of which was 400 feet deep, and extensive workings on at least three levels. In 1983 and 1984, Houston Oil and Mineral Exploration Corporation drilled 21 holes at the mine and at the Paul Lake (CR200), Amazon (CR209), and Boston (CR207) properties (Oliver and Adams, 1984).

Production notes:
The Valpariso Mine was the most productive in the Dolomi area and has been described in many publications (for example: Brooks, 1902; Wright and Wright 1905, 1906, 1908; Smith, 1914; Smith, 1934; Dyer, 1952, 1956; Herreid, 1967; Maas and others, 1991, 1995). By 1902, the mine had already been developed by two shafts and one small ore shipment had been made. Development and production took place fairly regularly from 1898 to 1920, and the deposit was mined by a lessor in 1927 and again in 1932. The mine plant was extensively rebuilt in 1935 and again in 1954, but no ore was produced. Smith (1934) and Dyer (1952, 1956) reported that the mine produced about 5,000 ounces of gold to 1933. U.S. Bureau of Mines records (Maas and others, 199, 1995) document the production of about 730 ounces of gold and 521 ounces of silver from 1914 to 1933.

Reserves:
In 1934, after the last mining, Smith estimated that the deposit contained 22,500 tons of probable ore in place with an average grade of 0.28 ounce of gold per ton and minor silver.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Brooks, 1913; Brooks, 1914; Smith, 1914; Brooks, 1915; Chapin, 1916; Smith, 1917 (B 142); Smith, 1917 (B 153); Smith, 1932; Smith, 1933 (B 844-A); Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Smith, 1936; Smith, 1937; Dyer, 1952; Dyer, 1956; Bufvers, 1967; Herreid, 1967; Eberlein and others, 1983; Oliver and Adams, 1984; Maas and others, 1991; Maas and others, 1995; Brew, 1996.

Primary reference: Herreid, 1967; Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Wednesday

Site type: Prospect

ARDF no.: CR198

Latitude: 55.1372 **Quadrangle:** CR A-1

Longitude: 132.0836

Location description and accuracy:

The only description of this prospect is by Brooks (1902). The location is shown on figure 18 of Wright and Wright (1908), but they did not describe it. It is near, if not the same as, a prospect described by Maas and others (1995) under the name 'Paul Lake south.' The site is about 0.2 mile south of Paul Lake in about the center of section 1, T. 78 S., R. 88 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals:

Gangue minerals: Calcite

Geologic description:

As described by Brooks (1902), the deposit on the Wednesday claim is a vein about 3 feet thick in a schist layer in marble. The vein consists mainly of calcite; it strikes N50E and dips 45-60S, and is cut by several faults. It is exposed in a small cut. The metals of interest were not mentioned by Brooks, but he implied that the vein is gold-bearing. A sample collected near this site by Maas and others (1995) contained 6,463 parts per million copper. The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

The vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Gold-calcite vein.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Only a small cut.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Herreid, 1967; Maas and others, 1995.

Primary reference: Brooks, 1902

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Elmer; Cape Horn

Site type: Prospect

ARDF no.: CR199

Latitude: 55.1397 **Quadrangle:** CR A-1

Longitude: 132.0699

Location description and accuracy:
This prospect is on the south side of Paul Lake about 0.4 mile from its east end. It is about 0.5 mile northwest of the center of section 6, T. 78 S., R 89 E. The only published information about the Elmer prospect is its location on a small-scale map by Wright and Wright (1908, figure 1). It is probably the Cape Horn prospect of Maas and others (1995), or near it.

Commodities:

Main: Au, Cu

Other:

Ore minerals:

Gangue minerals:

Geologic description:
The Elmer prospect is known only by name on a small-scale map by Wright and Wright (1908, figure 18). Maas and others (1995) call it the Cape Horn prospect. Their samples from a 25-foot adit contained up to 25 parts per billion gold and 421 parts per million copper. The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble. The Cape Horn prospect is near a contact between the schist and marble.

Alteration:

Age of mineralization:
The deposit is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Unstated, but probably a low-sulfide, brecciated gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
A 25-foot adit on a patented claim.

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1908; Herreid, 1967; Maas and others, 1995.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Paul; Jessie; James

Site type: Prospects

ARDF no.: CR200

Latitude: 55.1443 **Quadrangle:** CR A-1

Longitude: 132.0701

Location description and accuracy:
What are commonly referred to as the Paul and Jessie prospects are often considered to be an eastern extension of the vein at the Valpariso Mine (CR197). The center of the area of these prospects is near the north shore of Paul Lake about 0.5 mile south-southeast of Dolomi Mountain, and near the southwest corner of section 31, T. 77 S., R. 89 E.

Commodities:

Main: Au

Other: Ag, Cu, Pb, Zn

Ore minerals: Chalcopyrite, galena, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:
The vein at the Paul and Jessie prospects is generally considered to be the eastern extension of the vein at the Valpariso Mine (CR197) (Brooks, 1902; Wright and Wright, 1908; Herreid, 1967). Maas and others, 1991,1995) describe three short adits that expose a 1.8- to 4.0-foot-thick quartz vein in marble. The vein contains sparse pyrite, chalcopyrite, galena, sphalerite, and secondary copper minerals. It strikes about N70W, dips 10-25N, and can traced for about 220 feet in the workings. Eight samples across the vein contained 1.207 parts per million (ppm) to 1.105 ounces of gold per ton, 1.0 ppm to 1.84 ounces of silver per ton, and up to 310 ppm copper, 342 ppm lead, and 935 ppm zinc. The vein is conformable to the layering in a thick marble unit that is part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). Wales Group rocks in the Dolomi area are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
Vein is younger than the Late Proterozoic or Cambrian marble host rock.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Active?

Workings/exploration:

The only workings are three short adits that expose the vein.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Herreid, 1967; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Golden Fleece

Site type: Mine

ARDF no.: CR201

Latitude: 55.1519 **Quadrangle:** CR A-1

Longitude: 132.0542

Location description and accuracy:

This site marks the portals of the two main adits of the Golden Fleece Mine, about 0.2 mile north of the north end of James Lake. It is about 0.2 mile east-northeast of the center of section 31, T. 77 S., R. 89 E. Maas and others (1995) provide a detailed map of the underground workings.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Gold, pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:

The Golden Fleece Mine was discovered in 1899 and by 1901, a 5-stamp mill was erected at the north end of James Lake, and the mine was developed by considerable underground workings (Brooks, 1902; Wright and Wright, 1908; Bufvers, 1967; Herreid, 1967; Maas and others, 1991, 1995). The mine was active from 1901 to 1905, and produced ore that contained about $40 to $60 per ton in gold (at $20.67 per ounce). Considerable ore was mined in the 1920's that contained about $12 per ton in gold (at $20.67 per ounce). Bufvers (1967) indicated some mining in 1933. Production records are not available. As mapped by Maas and others (1991, 1995), the underground workings included a lower adit 428 feet long, an upper adit 195 feet long, a raise 222 feet long that connects the two levels, and stopes that extend to the surface.

The deposit consists of auriferous quartz veins along two parallel faults that trend north-northwest to north and dip about 20-50E (Brooks, 1902; Wright and Wright, 1908; Maas and others, 1991, 1995). The faults are marked by quartz lenses inches to more than 8 feet thick that pinch and swell along the trend. The faults follow the contact between blue marble and white marble; the marble is silicified and cut by diabase dikes. Several large natural caverns also are along the faults. The quartz contains minor pyrite, chalcopyrite, tetrahedrite, and native gold. Maas and others (1991, 1995) collected 15 samples in the underground workings. Most assayed between 328 and 2,493 parts per billion gold, but several samples across 0.5 to 3 feet of a quartz-rich portion of an old stope contained 0.550 to 1.585 ounces of gold per ton.

The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Silicification of marble.

Age of mineralization:

The mineralization is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
As mapped by Maas and others (199, 1995), the underground workings included a lower adit 428 feet long, an upper adit 195 feet long, a raise 222 feet long, and several stopes that extend to the surface.

Production notes:
The mine was active from 1901 to 1905, and produced ore that contained about $40 to $60 per ton in gold (at $20.67 per ounce). There was considerable ore mined in the 1920's that contained about $12 per ton in gold (at $20.67 per ounce). Bufvers (1967) indicated some mining in 1933. Production records not available.

Reserves:
None.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1908; Wright and Wright, 1908; Bufvers, 1967; Cobb, 1978; Herreid, 1967; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995.

Primary reference: Brooks, 1902; Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Chicago Kid; New Era

Site type: Prospects

ARDF no.: CR202

Latitude: 55.1467 **Quadrangle:** CR A-1

Longitude: 132.0548

Location description and accuracy:
The Chicago Kid and New Era prospects have rarely been described since the early 1900's. Either one may coincide with the 'James Lake West' prospect described by Maas and others (1992, 1995). The site is just west of James Lake, about 0.3 mile southeast of the center of section 31, T. 77 S., R. 89 E.

Commodities:

Main: Au

Other: Ag, Cu, Sb

Ore minerals: Pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:
Chapin (1916) describes the Chicago Kid prospect as 5-foot-wide quartz vein exposed in a shallow pit in brecciated limestone. The vein strikes N60E and dips 70SE and contains minor pyrite and tetrahedrite. The New Era prospect, which was explored by an adit, is a 30-foot quartz vein with disseminated pyrite; it strikes N30W and dips vertically. Maas and others (1992, 1995) described workings in this vicinity under the name 'James Lake West'; the workings consist of a 10-meter adit, trenches, and cuts. A quartz vein 12 feet thick can be traced for about 600 feet. Samples contained 8.1 to 54 parts per billion gold.
The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
The veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
Scattered workings include one or more short adits, trenches, and open cuts.

Production notes:

Probably none.

Reserves:
None.

Additional comments:

References:
Chapin, 1916; Herreid, 1967; Maas and others, 1992; Maas and others, 1995.

Primary reference: Chapin, 1916

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Alpha

Site type: Prospect

ARDF no.: CR203

Latitude: 55.1470 **Quadrangle:** CR A-1

Longitude: 132.0426

Location description and accuracy:
The Alpha prospect is about 0.2 mile north of the center of Lake Williams and about 0.4 mile southwest of the center of section 32, T. 77 S., R. 89 E.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz

Geologic description:
As described by Brooks (1902) and Wright and Wright (1908), the Alpha prospect is a quartz vein up to 5 feet wide that can be traced for nearly 2,000 feet. The vein is in white crystalline marble and strikes about north and dips 45W. It contains sparse pyrite and chalcopyrite; early samples contained about $4 to $25 per ton in gold (at $20.67 per ounce). Maas and others (1991, 1995) found a caved shaft, a short adit, and several trenches. Their samples contained up to 62 parts per billion gold and 1.8 percent copper. The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
Vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The workings include a shallow, caved shaft, a short adit, and several trenches.

Production notes:
Apparently none.

Reserves:
None.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Cobb, 1978; Maas and others, 1991; Maas and others, 1995.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Moonshine (near Dolomi)

Site type: Mine

ARDF no.: CR204

Latitude: 55.1443 **Quadrangle:** CR A-1

Longitude: 132.0518

Location description and accuracy:
The Moonshine Mine is about 0.3 mile west of the center of Lake Williams and about 0.6 mile southeast of the center of section 31, T. 77 S, R. 89 E. The location is accurate to within 0.1 mile.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:
The Moonshine Mine was discovered before 1914, and produced a little ore (Smith, 1914; Chapin, 1916). The workings consist of two adits, 68 and 78 feet long, and an open cut; the longer adit has a winze and a small stope. As described by Maas and others (1991,1995), a quartz vein 3.2 to 4.3 feet thick is exposed in the open cut for about 100 feet; the vein strikes N60W and dips 40N. The two adits penetrate the hanging wall of the vein exposed in the open cut and intersect several other veins. Several samples across the vein in the open cut contained 60 to 390 parts per billion gold. The highest gold values were in a 0.7-foot quartz vein in one of the adits: 3 samples contained 0.723 to 63.195 ounces of gold per ton. Smith (1914) indicates that the veins contain pyrite and tetrahedrite. Chapin (1916) describes the deposit as blocks of marble and schist cut by a network of quartz veins with disseminated chalcopyrite and pyrite.
The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
The workings consist of two short adits, one with a winze and a small stope, and an open cut.

Production notes:
Minor production prior to 1914.

Reserves:
None.

Additional comments:

References:
Smith, 1914; Chapin, 1916; Herreid, 1967; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Fortune

Site type: Mine

ARDF no.: CR205

Latitude: 55.1432 **Quadrangle:** CR A-1

Longitude: 132.0484

Location description and accuracy:
The Fortune Mine is about 0.2 mile west of Lake Williams and about 0.1 mile south of James Lake. It is near the southeast corner of section 31, T. 77 S., R. 89 E.

Commodities:

Main: Ag, Au

Other: Cu, Sb

Ore minerals: Chalcopyrite, gold, pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:
As described by Brooks (1902), Wright and Wright (1908), Smith (1914), Chapin (1916), and Brooks and Capps (1924), the deposit at the Fortune Mine consists of 3 quartz veins 1 to 2 feet thick in graphitic schist with bands of marble. The veins strike N30W to N60W and dip 10 to 25N. They contain minor tetrahedrite, chalcopyrite, and pyrite. The Fortune Mine consists of a shallow shaft and several open cuts. There were small test shipments, one as late as 1922, but apparently no significant production. The schist and marble are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967).
The geology of the Dolomi area is dominated by an arcuate, generally north-trending, fault system and by a large dome centered over the eastern third of Paul Lake (Herreid, 1967). The Wales Group country rocks consist chiefly of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:
The Fortune Mine consists of a shallow shaft and several open cuts.

Production notes:

There were small test shipments, one as late as 1922, but apparently no significant production.

Reserves:
None.

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Chapin, 1916; Brooks and Capps, 1924; Herreid, 1967; Cobb, 1978.

Primary reference: Chapin, 1916

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Jumbo (near Dolomi); Wellfleet

Site type: Prospect

ARDF no.: CR206

Latitude: 55.1414 **Quadrangle:** CR A-1

Longitude: 132.0520

Location description and accuracy:

The Jumbo prospect is probably about 0.3 mile east of Paul Lake and about 0.6 mile mile north-northeast of the center of section 6, T. 78 S, R. 89 E. The location is accurate to within 0.2 mile. This prospect is in an area with a concentration or claims and prospects, some of which cannot be precisely located or identified. The Wellfleet prospect is nearby.

Commodities:

Main: Ag, Au

Other:

Ore minerals: Pyrite, tetrahedrite

Gangue minerals: Calcite, quartz

Geologic description:

The Jumbo prospect has been described differently by Brooks (1902) and by Maas and others (1992). According to Brooks, the Jumbo prospect is a bluish quartz-breccia vein with gold and tetrahedrite that cuts graphitic phyllite. It was explored by a 40-foot shaft. Maas and others did not find the shaft in the recently logged area, but did locate a 115-foot adit in gray marble. Two veins are exposed in the adit. One is a quartz-breccia vein up to 4 feet thick that strikes N80W and dips 30N. A sample across the vein contained 2,673 parts per billion (ppb) gold. Another quartz-breccia vein is exposed for 51 feet along the adit. The vein strikes N80-90E and dips 30-35N; a 51-foot sample averaged 1,515 ppb gold.

Brooks (1902) describes the Wellfleet claim as (just?) west of the Jumbo, but Wright and Wright (1908) show it just to the south. According to Brooks, it is a 'quartz ledge' 20 to 25 feet thick in graphitic phyllite. The vein contains pyrite and samples were said to contain $2 to $4 in gold (at $20.67 per ounce). There is no record of production from either the Jumbo or the Wellfleet deposits, and no report of work on them since 1915 (Chapin, 1916).

The geology of the Dolomi area is dominated by an arcuate, generally north-trending, fault system and by a large dome centered over the eastern third of Paul Lake (Herreid, 1967). The Wales Group country rocks consist chiefly of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
Brooks (1902) describes the workings as a 40-foot shaft. Maas and others (1991) could not locate the shaft but did find a 115-foot adit.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Chapin, 1916; Herreid, 1967; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Boston

Site type: Prospects

ARDF no.: CR207

Latitude: 55.1406 **Quadrangle:** CR A-1

Longitude: 132.0442

Location description and accuracy:

The Boston prospects, which extend for several hundred feet, are centered about 0.5 mile east of Paul Lake and about 0.3 mile south-southeast of the northwest corner of section 5, T. 78 S., R. 89 E. The prospects, first called Boston by Herreid (1967), are a group of pits, adits, and shafts along the east shore of 'Amazon Lake.' (Amazon Lake is not shown on the USGS 1:63,360-scale topographic map, but it is frequently referred to by name in old reports on the area; it is the small lake about 0.4 mile east of Paul Lake and just southwest of Lake Williams). Maas and others (1991, 1995) also locate the Boston prospects there. However, the Boston prospects are in an area with numerous other claims and prospects, some of which cannot be precisely located or identified in the literature. One or more of the Boston prospects may previously have been described under other names (for example, see CR208-210).

Commodities:

Main: Ag, Au, Cu

Other: Sb

Ore minerals: Gold, pyrite, tetrahedrite

Gangue minerals: Quartz

Geologic description:

The Boston prospects east of Amazon Lake have been explored by trenches, open cuts, at least one adit, several shafts, and at least one drill hole. Herreid (1967) describes three prospects. One consists of slumped trenches and a caved adit in chlorite schist. It is a zone more than 30 feet wide of silicified marble and quartz veins that strike N60E and dip steeply. The central part of the zone is an irregular, brecciated quartz vein with less than 1 percent pyrite and tetrahedrite. The second prospect consists of an adit in banded silicified marble ('jasperoid') at least 50 feet wide that contains quartz veins. The dump of the adit is mainly quartz with minor tetrahedrite and copper staining. A sample contained 0.01 ounce of gold per ton. Two inclined shafts nearby are in banded quartzite cut by quartz veins with minor tetrahedrite. A sample contained 0.10 ounce of gold per ton. The third prospect consists of several quartz veins exposed in an adit and in surface pits. One 6-inch-thick quartz vein in marble contains about 10 percent tetrahedrite.

Maas and others (1991) sampled several quartz veins 2.2 to 3 feet thick. The samples contained 420 to 4,789 parts per billion gold; one sample contained 3.94 ounces of silver per ton and 636 parts per million (ppm) copper. Maas and others (1995) also sampled a quartz vein up to 12 feet thick that can be traced for about 530 feet; it averaged 2.7 ppm gold. Houston Oil and Minerals drilled at or near this site in the early 1980's (Oliver and Adams, 1984).

The rocks in the Dolomi area are part of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). They are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Silicification of marble.

Age of mineralization:

Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
Several prospects have been explored by trenches, open cuts, at least one adit, and several shafts. Houston Oil and Minerals drilled at or near this site in the early 1980's (Oliver and Adams, 1984).

Production notes:
Apparently none.

Reserves:

Additional comments:

References:
Herreid, 1967; Oliver and Adams, 1984; Maas and others, 1991; Maas and others, 1995.

Primary reference: Herreid,1967

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Beauty; Triangle No. 2; Home; Welcome

Site type: Prospects

ARDF no.: CR208

Latitude: 55.1404 **Quadrangle:** CR A-1

Longitude: 132.0485

Location description and accuracy:

This site is about 0.3 mile south of James Lake and about 0.6 mile northeast of the center of section 6, T. 78 S., R. 89 E. It includes four prospects/claims about a half mile north of Dolomi. They were originally described between 1902 and 1908 but not since, and they probably have been incorporated into one or more of the nearby properties. The Beauty claim is the only one that can be confidently located, and that site (the one used for this record) is based only on a small-scale map by Wright and Wright (1908, figure 18). The other three claims or prospects adjoin, or probably are within 0.3 mile of, the Beauty claim.

Commodities:

Main: Ag, Au

Other:

Ore minerals: Chalcopyrite, gold(?), tetrahedrite

Gangue minerals: Calcite, quartz

Geologic description:

This site includes 4 similar deposits (Brooks, 1902; Wright and Wright, 1908). The deposit on the Beauty claim is in marble and consists of a quartz vein 12-18 inches thick that strikes N20W and dips 30SW. The vein contains chalcopyrite and tetrahedrite, and samples assayed up to $600 per ton in silver and $20 per ton in gold (at $20.67 per ounce). Another vein on the same claim strikes N20E and dips 20SE. The Beauty claim was explored by 2 shafts 45 feet deep and a drift that connected them.

The Home deposit is a quartz vein up to 2 feet thick that cuts fractured marble. The vein contains pyrite and tetrahedrite. At the Triangle #2 claim, a quartz-calcite vein 4 to 5 feet thick is exposed in a pit. The vein strikes N40W and dips 35NE. Samples assayed as high as $40 per ton (presumably in gold and silver). On the Welcome claim, a mineralized shear zone at the contact of schist and marble was said to contain free gold.

Most, if not all four, of these claims/prospects are probably included in what Herreid (1967) calls 'Prospects east of Amazon Lake,' 'Prospects east of central Amazon Lake,' and 'Prospects west of Amazon and James Lake.' However, his prospect names cannot be correlated with the names of the prospects at this site in the older literature. As in the old reports, Herreid repeatedly mentions the occurrence of tetrahedrite in many of the deposits in this area.

The geology of the Dolomi area is dominated by an arcuate, generally north-trending, fault system and by a large dome centered over the eastern third of Paul Lake (Herreid, 1967). The Wales Group country rocks consist chiefly of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

Veins are younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
Explored by pits and several shallow shafts with some minor underground workings.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Herreid, 1967.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Amazon

Site type: Prospects

ARDF no.: CR209

Latitude: 55.1391 **Quadrangle:** CR A-1

Longitude: 132.0526

Location description and accuracy:

According to Maas and others (1995), the Amazon prospect is about 0.3 mile east-southeast of the mouth of Paul Lake and about 0.3 mile northeast of the center of section 6, T. 78 S., R. 89 E. Their location is used in this record. Wright and Wright (1908, figure 18) place it about 0.3 mile to the north, but that location is suspect in view of their somewhat generalized, small-scale map.

Commodities:

Main: Au

Other:

Ore minerals:

Gangue minerals: Quartz

Geologic description:

As described by Wright and Wright (1905, 1908), the Amazon prospect is a quartz-breccia vein 5 to 10 feet thick that is conformable with the bedding in calcareous schist. The workings consisted of an inclined shaft 125 feet deep with 30-foot drifts to each side of the 50-foot level. There is no record of work after 1916. Maas and others (1991) located a flooded shaft, a dump, and exposures of the vein at the surface. Three samples--dump material, rubble at the shaft, and an outcrop of the vein--contained 4,455 parts per billion gold to 0.272 ounce of gold per ton. Houston Oil and Minerals drilled at or near this prospect in the early 1980's (Oliver and Adams, 1984).

The vein cuts rocks of the Wales Group of Late Proterozoic and Cambrian age (Herreid, 1967). The Wales Group rocks are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

Vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The workings consisted of an inclined shaft 125 feet deep with 30-foot drifts to each side of the 50-foot level. Houston Oil and Minerals drilled at or near this prospect in the early 1980's (Oliver and Adams, 1984).

Production notes:

Reserves:

Additional comments:

References:

Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright and Wright, 1908; Wright, 1909; Chapin, 1916; Herreid, 1967; Oliver and Adams, 1984; Maas and others, 1991; Maas and others, 1992; Maas and others, 1995.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Salmon

Site type: Prospect

ARDF no.: CR210

Latitude: 55.1347 **Quadrangle:** CR A-1

Longitude: 132.0529

Location description and accuracy:

Brooks (1902) and Wright and Wright (1908) describe the location and geology of the Salmon prospect differently. For this record, the location follows Wright and Wright (1908), who place the prospect about 0.2 mile northwest of the head of Dolomi Bay, on the south side of the creek that leads to Paul Lake. It is about 0.3 mile east-southeast of the center of section 6, T. 78 S., R. 89 E. Brooks' location is less than 0.1 mile to the north, on the north side of the creek.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, galena, gold, pyrite

Gangue minerals: Quartz

Geologic description:

The only descriptions of the Salmon prospect are by Brooks (1902) and Wright and Wright (1908). Their descriptions differ significantly in detail and they may be describing different prospects, although both reports refer specifically to the Salmon prospect/claim.

As described by Brooks (1902), the workings on the Salmon claim are a small crosscut and pit in sheared limestone. The deposit consists of a quartz vein about 5 feet wide at the surface that narrows to about 1 foot at the bottom of the pit. The quartz contains native gold, pyrite, and galena. Samples averaged about $8 per ton in gold (at $20.67 per ounce). As described by Wright and Wright (1908), the deposit consists of a quartz breccia vein 5 to 15 feet wide that can be traced for about 300 feet in open cuts and a shallow pit. The vein strikes about N80W; it is much oxidized at the surface, but fresh samples contain native gold, pyrite, and chalcopyrite.

The geology of the Dolomi area is dominated by an arcuate, generally north-trending, fault system and by a large dome centered over the eastern third of Paul Lake (Herreid, 1967). The Wales Group country rocks consist chiefly of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:

Vein is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

36a

Production Status: None

Site Status: Undetermined

Workings/exploration:

The deposit has been explored by open cuts, at least one pit, and, according to one description, a short crosscut.

Production notes:

None apparently.

Reserves:

None.

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Herreid, 1967; Cobb, 1978.

Primary reference: Wright and Wright, 1908

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Stockton Quartz

Site type: Prospect

ARDF no.: CR211

Latitude: 55.1267 **Quadrangle:** CR A-1

Longitude: 132.0565

Location description and accuracy:
This prospect is about 0.3 mile west of lower Dolomi Bay and about 0.4 mile north-northeast of the center of section 7, T. 78 S., R. 89 E.

Commodities:

Main: Au

Other:

Ore minerals:

Gangue minerals: Quartz

Geologic description:
As described by Maas and others (1991,1995), the Stockton Quartz prospect has a flooded shaft with a small dump. The rocks on the dump consist of quartz and blocks of greenstone. Two samples contained 9 and 20 parts per billion gold. Herreid (1967) maps the rocks near the prospect as part of a band of green-schist in the Wales Group of Late Proterozoic and Cambrian age. The Wales Group rocks rocks in the Dolomi area are folded into a large dome centered over the eastern third of Paul Lake, and consist of several marble layers 200 to 1300 feet thick, interbedded with calcareous chlorite schist and marble.

Alteration:

Age of mineralization:
The deposit is younger than the Late Proterozoic or Cambrian host rocks.

Deposit model:
Probably a low-sulfide, brecciated gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The only evidence of workings is a flooded shaft and a small dump. The prospect is on a patented claim.

Production notes:

Reserves:

Additional comments:

References:
Herreid, 1967; Maas and others, 1991; Maas and others, 1995.

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Moss Point)

Site type: Occurrence

ARDF no.: CR212

Latitude: 55.1198

Quadrangle: CR A-1

Longitude: 132.0465

Location description and accuracy:

This prospect is near Moss Point on the south side of Port Johnson. It is about 0.5 mile east-southeast of the center of section 7, T. 78 S., R. 89 E. Pyritic zones in phyllite extend from near Moss Point south to an elevation of about 400 feet. The location is accurate.

Commodities:

Main: Au, Cu, Zn

Other:

Ore minerals: Pyrite

Gangue minerals:

Geologic description:

Maas and others (1991) found an old adit at this site, but apparently there is no earlier record of it. Near Moss Point, an iron-stained pyrite-bearing zone about 12 feet wide occurs in phyllite. A chip sample across the zone contained 0.01 ounce of gold per ton, 30 parts per million (ppm) copper, and 100 ppm zinc. Another pyrite-bearing zone about 20 feet wide in phyllite on the beach contained 5 to 44 parts per billion (ppb) gold. Several more pyrite-bearing zones occur in the phyllite to the south up to an elevation of about 400 feet. The best sample from those zones assayed 165 ppb gold. A 20-foot adit south of Moss Point at an elevation of about 365 feet was driven on another such zone. Samples along 7 to 19 feet of the adit contained 6 to 144 ppb gold. Hedderly-Smith (1999 [Inventory]) suggests that the deposit is of submarine volcanogenic origin. The rocks in the area are part of the Wales Group of Late Proterozoic and Cambrian age (Eberlein and others, 1983; Brew, 1996).

Alteration:

Age of mineralization:

Syngenetic volcanogenic deposit in phyllite of Late Proterozoic or Cambrian age.

Deposit model:

Pyrite-bearing volcanogenic deposit in phyllite.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

The only working is an old 20-foot adit. The prospect has been sampled by government and industry geologists.

Production notes:

Reserves:

Additional comments:

References:

Eberlein and others, 1983; Maas and others, 1991; Hedderly-Smith, 1993 (1992 season); Maas and others, 1995; Brew, 1996; Hedderly-Smith, 1999 (Inventory).

Primary reference: Maas and others, 1991

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Hope (west of North Arm Moira Sound); Navajo

Site type: Prospect

ARDF no.: CR213

Latitude: 55.1042 **Quadrangle:** CR A-1

Longitude: 132.1502

Location description and accuracy:

The Hope prospect is at an elevation of about 750 feet, about 0.7 mile southwest of Cannery Point on the south shore of upper North Arm Moira Sound. It is about 0.4 mile east-southeast of the center of section 16, T. 78 S., R. 88 E.

Commodities:

Main: Ag, Au, Cu

Other:

Ore minerals: Chalcopyrite, gold, pyrite

Gangue minerals: Quartz

Geologic description:

As described by Brooks (1902), the deposit at the Hope prospect is a quartz vein about 2 feet thick that contains free gold, pyrite, and minor chalcopyrite. The deposit was prospected by a 20-foot tunnel and several pits. A sample of the vein contained $40 per ton in gold (at $20.67 per ounce). A sample of a 12-foot-wide surface exposure of the vein contained abut $38 per ton in gold. Wright and Wright (1908) also examined the prospect, but gave few details beyond indicating that the vein is in chlorite schist near a large granitic intrusion. This contradicts Brooks, who reported that the vein is in silicified diorite porphyry. Maas and others (1992) identified a quartz vein in blocky greenstone that could be traced for about 90 feet in a short adit, trenches, and open cuts. Their samples contained 23 to 2,506 parts per million (ppm) copper, 12 ppm to 4.76 ounces of silver per ton, and 939 parts per billion to 1.487 ounces of gold per ton.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:

Wallrock of vein is silicified.

Age of mineralization:

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status:

Site Status:

Workings/exploration:

Short adit, trenches, and open cuts, most or all of which probably date from before WW I.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Smith, 1914; Eberlein and others, 1983; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Maas and others, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Bluebird; Westlake; Homestake; Little Annie

Site type: Prospects

ARDF no.: CR214

Latitude: 55.1027 **Quadrangle:** CR A-1

Longitude: 132.1661

Location description and accuracy:

This site represents three neighboring claims: the Bluebird, Homestake, and Little Annie. The Bluebird was explored by a 40-foot shaft, which is at an elevation of about 1,500 feet. It is about 1.0 mile southwest of the head of Cannery Cove in about the center of the SW1/4 section 16, T. 78 S., R. 88 E.

Commodities:

Main: Au

Other: Ag, Cu, Pb

Ore minerals: Galena, gold, hematite, pyrite, sphalerite

Gangue minerals:

Geologic description:

When first described by Brooks (1902) and Wright and Wright (1908), the property consisted of three claims: the Little Annie, Homestake, and Bluebird. At the Little Annie prospect, at an elevation of about 1,200 feet, quartz stringers oriented N30E, 70 SE in granite contain sparse pyrite and low gold values. The Little Annie may be the 'Bluebird East' prospect of Maas and others (1995), where samples contained negligible gold values. The Bluebird claim, at an elevation of about 1,500 feet, was explored in the early 1900s by a 40-foot shaft and several pits. A 3- to 6-foot-thick quartz vein that contains sparse galena, sphalerite, pyrite, and free gold cuts phyllite and greenschist near a granitic intrusion. Samples reportedly contained up to $40 to $60 a ton in gold (at $20.67 per ounce). Maas and others (1992) describe a vein up to 3 feet thick on the Bluebird claim. The vein strikes about N60W and dips 45 SW; it can be traced for about 90 feet. It consists mostly of smoky quartz with sparse pyrite, hematite, and sulfides. Samples across 0.8 to 2.7 feet of the vein contained 6 to 228 parts per million (ppm) gold, up to 198 ppm lead, and 301 ppm zinc. The wallrock of the vein is silicified. Selected samples from dumps contained up to 1.901 ounces of gold per ton.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:

Silicification of wallrock near vein(s).

Age of mineralization:

Uncertain; depending on the age of the host rock, may be Late Proterozoic or younger, or Tertiary or younger.

Deposit model:

Low-sulfide gold-quartz vein (Cox and Singer, 1986; model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production Status: None

Site Status: Undetermined

Workings/exploration:
The Bluebird claim was explored by a 40-foot shaft and pits prior to WW I.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Wright and Wright, 1908; Martin, 1920; Bufvers, 1967; Cobb, 1978; Eberlein and others, 1983; Maas and others, 1991; Gehrels, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Maas and others, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Wakefield; Moira Copper

Site type: Prospect

ARDF no.: CR215

Latitude: 55.0744 **Quadrangle:** CR A-1

Longitude: 132.1782

Location description and accuracy:
The Wakefield prospect is at an elevation of about 1,300 feet, east of upper Lake Luelia. It is on the nose of the ridge that extends north-northwest from elevation 2577, and about 0.4 mile southeast of the center of section 29, T. 78 S., R. 88 E.

Commodities:

Main: Au, Cu

Other: Ag

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Epidote, quartz

Geologic description:
As described by Wright and Wright (1906, 1908), the workings are a 50-foot shaft with mineralization exposed at the 25-foot level, and several open cuts. There was assessment work as late as 1915. The host rock is greenschist, slate and 'grits.' The deposit consists of a lenticular mass of chalcopyrite 10 feet thick in a 60-foot-thick mineralized layer in the schist that contains considerable pyrite, quartz, and epidote. The Wrights considered the deposit to be similar to the mineralization at the Niblack Mine (CR216). The prospect was examined by Maas and others (1992), who found a flooded shaft, a 17-foot adit, and some trenches. The workings expose a zone up to 100 feet wide of iron-stained, epidote-bearing, silicified greenschist that contains disseminations and layers of pyrite and chalcopyrite. Chip samples 1.3 to 4 feet long contained 221 to 656 parts per billion gold (ppb) and 851 to 7,566 parts per million (ppm) copper. A select sample contained 1,732 ppb gold, 47.2 ppm silver, and 6.57 percent copper.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:
Greenschist is iron stained and silicified.

Age of mineralization:
Probably contemporaneous with the deposition of the Silurian or Ordovician host rocks.

Deposit model:
Probably a Bessi-type, volcanogenic massive-sulfide copper deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Undetermined

Workings/exploration:
Explored prior to WW I by a 50-foot shaft, a short adit, and several trenches.

Production notes:

Reserves:

Additional comments:

References:
Wright and Wright, 1906; Wright and Wright, 1908; Chapin, 1916; Eberlein and others, 1983; Maas and others, 1992; Gehrels, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Maas and others, 1992

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Niblack

Site type: Mine

ARDF no.: CR216

Latitude: 55.0666 **Quadrangle:** CR A-1

Longitude: 132.1475

Location description and accuracy:

This site is the old Niblack Mine that operated from 1902 to 1909. It is just above the shoreline at the head of Niblack Anchorage. It is identified on the USGS 1:63,360-scale topographic map by the name of the old settlement, and it is about 0.6 mile east-northeast of the center of section 33, T. 78 S., R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine. Those deposits are described separately (CR217-223), but in the recent literature, the Niblack Mine and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other: Pb

Ore minerals: Chalcopyrite, galena, hematite, pyrite, sphalerite

Gangue minerals:

Geologic description:

The deposit at the Niblack Mine was first developed in 1902 and soon was put in production (Brooks, 1902; Wright and Wright, 1908; Berg and Cobb, 1967). Production continued until 1909, when the mine was closed due to legal actions and it has not produced since. The total production (from incomplete records) is 1,400,000 pounds of copper, 1,100 ounces of gold, and 15,000 ounces of silver. The mine was worked from several shafts, one to a depth of 300 feet. There were 5 levels of workings with a total of about 5,500 feet of drifts, raises, and winzes. Roppel (1991) provides a fascinating study of the personalities and the travails of mining at Niblack.

The deposit that was mined consisted of three large masses of sulfides, 90 to 200 feet long, 5 to 20 feet thick, and 50 to 100 feet deep, that were cut by numerous faults. The ore bodies consisted largely of pyrite and chalcopyrite, with minor sphalerite, galena, and hematite. In the older publications, the host rocks are described as greenstone schist with bands of quartzite, metamorphosed sandstone, and quartz-sericite schist. The ore bodies were parallel to the layering in the host rocks, whose strike is generally about N60W and dip about 60-70SW. In the older literature, the ore bodies were often described as veins or replacement deposits. However, recent geochemical and isotopic work by Slack and others (2002) demonstrates that this and the similar deposits nearby are volcanogenic massive-sulfide deposits of Silurian or Ordovician age.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: Yes; small

Site Status: Active

Workings/exploration:

The deposit at the Niblack Mine was first developed in 1902 and soon was put in production (Brooks, 1902; Wright and Wright, 1908; Berg and Cobb, 1967). Production continued until 1909, when the mine was closed due to legal actions and it has not produced since. The total production (from incomplete records) is 1,400,000 pounds of copper, 1,100 ounces of gold, and 15,000 ounces of silver. The mine was worked from several shafts, one to a depth of 300 feet. There were 5 levels of workings with a total of about 5,500 feet of drifts, raises, and winzes. Roppel (1991) provides a fascinating study of the personalities and the travails of mining at Niblack.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits.

Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

Production notes:

The total production of the Niblack Mine from 1902 to 1909 (based on incomplete records) was 1,400,000 pounds of copper, 1,100 ounces of gold, and 15,000 ounces of silver.

Reserves:

In the most recent annual report of the Alaska Division of Geological and Geophysical Surveys, the resources at 'Niblack' are stated to be 2.78 million tons of material grading 3.3 percent zinc, 1.7 percent copper, 1.14 ounce of silver per ton, and 0.087 ounce of gold per ton (Swainbank and others, 2002). Similar figures have been cited in their annual reports for several years. Most or all of this resource, however, is at the Lookout prospect (CR221), not at the Niblack Mine (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Knopf, 1910; Smith, 1914; Chapin, 1916; Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Edith M

Site type: Prospect

ARDF no.: CR217

Latitude: 55.0639 **Quadrangle:** CR A-1

Longitude: 132.1377

Location description and accuracy:

The Edith M prospect is just above the shoreline, about 0.5 mile southeast of the abandoned settlement of Niblack at the head of Niblack Anchorage. It is at the center of section 34, T. 78 S., R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Edith M prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:

The Edith M prospect is one of several similar prospects (CR217-CR223) that cover about a square mile southeast of the old Niblack Mine (CR216). Little information has been published about the Edith M prospect since it was first described by Brooks (1902) as a 20-tunnel. The deposit consists of a zone about 1 foot thick in mineralized greenstone with chalcopyrite and pyrite. His samples contained up to $5 per ton in copper and gold (at 1902 metal prices). Brooks also noted several other such zones, including one 8 feet thick that contains pyrite. Maas and others (1992) collected several chip samples that contained 18-83 parts per billion gold, and up to 104 parts per million (ppm) copper and 225 ppm Zn. The Edith M prospect is on a large geophysical anomaly that has received considerable attention during recent exploration in the area (Maas and others, 1995). Recent geochemical and isotopic work by Slack and others (2002) confirm that this and nearby similar deposits are volcanogenic massive-sulfide deposits of Silurian or Ordovician age.

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:
Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits. Brooks (1902) noted silicification adjacent to the gold-bearing veins.

Age of mineralization:
Silurian or Ordovician.

Deposit model:
Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
24b

Production Status: None

Site Status: Active

Workings/exploration:
The only working is an old 20-foot adit; it has been sampled and visited in recent years during mineral exploration in the surrounding area.

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1902; Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lindsey

Site type: Prospect

ARDF no.: CR218

Latitude: 55.0620 **Quadrangle:** A-1

Longitude: 132.1365

Location description and accuracy:

The Lindsey prospect is at an elevation of about 500 feet, about 0.5 mile southeast of the abandoned settlement of Niblack at the head of Niblack Anchorage. It is about 0.1 mile southeast of the center of section 34, T. 78 S., R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Lindsey prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals:

Geologic description:

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

The Lindsey prospect as described by Maas was found in 1992. It is in coarse-grained felsic volcaniclastic rocks that contain up to 20 percent sulfides in fragments up to 3 feet across. The deposit is in a northwest-trending, induced-polarization geophysical anomaly that extends to the Niblack Mine (CR216). Recent geochemical and isotopic work by Slack and others (2002) confirm that this deposit is of Silurian or Ordovician age. Abacus Minerals mentions the Lindsey prospect on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004), as one of their promising prospects in the area.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

Not cited in the literature, but as of 2004, mentioned as one of the promising prospects in the area. It has almost certainly been sampled and may have been drilled.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1905; Wright and Wright, 1906; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Wright, 1909; Knopf, 1910; Smith, 1914; Chapin, 1916; Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Beach

Site type: Prospect

ARDF no.: CR219

Latitude: 55.0617 **Quadrangle:** CR A-1

Longitude: 132.1303

Location description and accuracy:

The Beach prospect is near the shoreline about 0.8 mile southeast of the abandoned town of Niblack at the head of Niblack Anchorage. It is about 0.2 mile east-southeast of the center of section 34, T. 78 S., R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Beach prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Au, Cu

Other:

Ore minerals: Chalcopyrite, pyrite

Gangue minerals:

Geologic description:

Little information is available for the Beach prospect; Maas and others (1995) list it in their table of prospects in the Niblack area. They collected several samples that contain up to 43 parts per billion gold and 225 parts per million zinc. The only working is an adit about 40 feet long.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

Details are lacking, but the Beach prospect probably shares many of these characteristics. The deposit is in a northwest-trending, induced-polarization geophysical anomaly that extends to the Niblack Mine (CR216).

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

Only a 40-foot adit is reported, but the prospect has probably been mapped and sampled during the extensive work in the area since the 1970's.

Production notes:

Reserves:

Additional comments:

References:

Herreid, 1964; Peek, 1975; Eberlein and others, 1983; Green and others, 1989; Brewer, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Broadgauge

Site type: Prospect

ARDF no.: CR220

Latitude: 55.0595 **Quadrangle:** CR A-1

Longitude: 132.1358

Location description and accuracy:

The Broadgauge prospect is at an elevation of about 700 feet, about 0.6 mile east-northeast of hill 2230 and about 0.3 mile south-southeast of the center of section 34, T. 78 S, R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Broadgauge prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals:

Geologic description:

The Broadgauge prospect was not identified by early workers in the area, but was described by Maas and others (1992, 1995). The workings consist of three short adits, the longest about 30 feet long. The deposit at the Broadgauge prospect presumably is similar to the other volcanogenic massive sulfide deposits in the area (CR216-CR223), but the only public information specifically about it is limited sampling by Maas and others (1992). Their samples contained up to 209 parts per billion gold, 0.6 part per million (ppm) silver, 230 ppm copper, and 760 ppm Zn. Recent geochemical and isotopic work by Slack and others (2002) demonstrates that this and the similar nearby prospects nearby are volcanogenic massive-sulfide deposits of Silurian and Ordovician age.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

The only workings on the prospect consist of three short adits that probably date to before WW I.

Production notes:

Reserves:

Additional comments:

References:

Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Lookout; Conundrum

Site type: Prospect

ARDF no.: CR221

Latitude: 55.0576 **Quadrangle:** CR A-1

Longitude: 132.1461

Location description and accuracy:

The Lookout prospect is at an elevation of about 1,800 feet, about 0.2 mile northeast of elevation 2230 and about 0.1 mile north-northeast of the southwest corner of section 34, T. 78 S., R 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Lookout prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, covellite, pyrite, sphalerite

Gangue minerals: Quartz

Geologic description:

The Lookout prospect as described by Brooks (1902) and Wright and Wright (1908) consists of a mineralized zone up to 300 feet thick in quartz-sericite schist. Within the zone, mineralized bands consist largely of covellite, chalcopyrite, and pyrite. Locally, there are quartz veinlets that have gold values. Brooks (1902) notes silicification adjacent to the veinlets. As of 1908, the workings consisted of two adits, one 160 feet long and the other 60 feet long, and several trenches.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

After Abacus Minerals obtained the Lookout prospect in 1995, they drilled at least 45 holes in 1996 and 1997 on it. They have defined an inferred resource of 2.78 millions tons of material grading 2.77 grams of gold and 35.46 grams of silver per ton, 1.71 percent copper, and 3.22 percent zinc (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004). (This resource is attributed to the 'Niblack' or 'Niblack Project' in recent annual reports of the Alaska Division of Geological and Geophysical Surveys (Swainbank and others, 2002), but it is entirely at the Lookout prospect.).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits. Brooks (1902) noted silicification adjacent to the gold-bearing quartz veinlets.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

As of 1908, the workings consisted of two adits, one 160 feet long and and the other 60 feet long, and several trenches. After Abacus Minerals obtained the Lookout prospect in 1995, they drilled at least 45 holes in 1996 and 1997 on it.

Production notes:

Reserves:

Abacus Minerals have defined an inferred resource of 2.78 millions tons of material grading 2.77 grams of gold and 35.46 grams of silver per ton, 1.71 percent copper, and 3.22 percent zinc (www.amemining.com/properties/niblack_project/; Jan. 26. 2004). (This resource is attributed to the 'Niblack' or 'Niblack Project' in recent annual reports of the Alaska Division of Geological and Geophysical Surveys (Swainbank and others, 2002), but it is entirely at the Lookout prospect.)

Additional comments:

References:

Brooks, 1902; Wright, 1907; Wright, 1908; Wright and Wright, 1908; Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Trio

Site type: Prospect

ARDF no.: CR222

Latitude: 55.0575 **Quadrangle:** CR A-1

Longitude: 132.1373

Location description and accuracy:

The Trio prospect is about 0.5 mile east-northeast of hill 2230 and about 0.5 mile south of the center of section 34, T. 78 S., R. 88 E. From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Trio prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals:

Geologic description:

The deposit on the Trio claims was described by Brooks (1902) as similar to the deposit at the nearby Lookout prospect (CR221); the only workings were a short crosscut that exposed a 10-foot-wide orebody.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade. Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

Maas and others (1992, 1995) collected several samples at the Trio prospect that contained up to 215 parts per billion gold, 1.2 parts per million (ppm) silver, 7,874 ppm copper, and 418 ppm zinc. Abacus Minerals drilled at least one hole on the Trio prospect in 1996 or 1997; 16.1 feet of that hole averaged 0.069 ounce of gold per ton, 1.35 ounce of silver per ton, 6.96 percent copper, and 8.18 percent zinc (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

A short adit was driven prior to 1902; at least one hole was diamond drilled in 1996 or 1997.

Production notes:

Reserves:

Additional comments:

References:

Herreid, 1964; Berg and Cobb, 1967; Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Dama; Copper Cliff

Site type: Prospect

ARDF no.: CR223

Latitude: 55.0569 **Quadrangle:** CR A-1

Longitude: 132.1273

Location description and accuracy:

The Dama prospect is at an elevation of about 750 feet, about 0.9 mile east-northeast of hill 2230 and about 0.2 mile west-northwest of the southeast corner of section 34, T. 78 S., R. 88 E.

From the late 1970's to the present (2004), there has been nearly continuous exploration of several geologically similar deposits in an area of about a square mile southeast of the old Niblack Mine (CR216). Those deposits are described separately (CR217-223), but in the recent literature, the Dama prospect and other deposits in the area are commonly grouped together under the name 'Niblack,' or 'Niblack project'.

Commodities:

Main: Ag, Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, copper, pyrite

Gangue minerals:

Geologic description:

There was considerable work on the Dama prospect from 1903 to 1905; the workings included a 250-foot tunnel with about 200 feet of drifts and crosscuts, a 40-foot-deep shaft, and several trenches (Wright and Wright, 1908; Twenhofel and others, 1949). The deposit consists of several mineralized bands up to 125 feet thick in greenschist; one contains more than 50 percent pyrite. Native copper occurs along joint surfaces. A chip sample collected by Twenhofel and others (1949) across 125 feet contained 0.11 percent copper.

Beginning in the mid-70's, a succession of companies, including Cominco-Alaska, Inc., Anaconda Minerals, Noranda Exploration, Houston Oil and Minerals, Long Lac Minerals, and, beginning in 1995, Abacus Minerals, have carried out extensive exploration on several deposits in the Niblack Mine area (CR217-223), testing the now widely accepted theory that they are volcanogenic, stratabound, massive-sulfide deposits. Those deposits are commonly grouped with the old Niblack Mine under the name 'Niblack' or 'Niblack Project'.

The exact location of most of the recent exploration in the Niblack area, including several generations of drilling, is not well documented in the public literature. Anaconda Minerals drilled at least two holes in 1978. Green and others (1989) note that Noranda and Lac Minerals drilled 24,000 feet on the deposits in the Niblack area through 1988, and Abacus Minerals drilled 39,000 feet in 1996 (1997?) (Swainbank and others, 1998). The exploration has been mentioned frequently in the annual reports of the Alaska Division of Geological and Geophysical Surveys since the early 80's. In their most recent annual report (Swainbank, and others, 2002), the deposits are grouped under the name 'Niblack'. The area currently is being explored by Abacus Minerals, and information about their work can be found on their web site (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

As described by Lac Minerals USA Inc.(1989) and Maas and others (1995), and from a cross-section by Abacus Minerals (www.abacusminerals.com/niblackxsec.htm; April 18, 2000), the area features several large folds that trend west-northwest. The folds consist of a layered sequence of rhyolitic flows and volcaniclastic rocks that host the ore deposits, a hanging wall of mafic flows and sedimentary rocks, and a foot wall of amygdaloidal mafic flows. All of the rocks are regionally metamorphosed to greenschist grade.

Maas and others (1991) describe three types of deposits at the Lookout prospect (CR221). It is the best-known deposit and probably typifies the other deposits in the area, including the one at the Niblack Mine. The three types are: 1) volcanogenic massive-sulfide bodies up to 20 feet thick with values of up to 4.9 percent copper, 8.0 percent zinc, 0.265 ounce of gold per ton, and 4.6 ounces of silver per ton; 2) stringer-type sphalerite mineralization in lithic tuffs in the footwalls of the massive sulfide bodies; and 3) auriferous, pyrite-bearing volcaniclastic rocks and polylithic breccias that typically contain about 0.05 ounce of gold per ton, 0.5 to 1.0 ounce of silver per ton, and 1 percent combined copper-zinc across widths of more than 50 feet.

Samples collected by Maas and others (1991) at the Dama prospect contained up to 0.843 part per million (ppm) gold, 20.7 ppm silver, 1.8 percent copper, and 2,203 ppm zinc. Recent work at the Dama prospect by Abacus Mining and Exploration Company indicates that the area is structurally complex. In 1995, they drilled at least one hole that cut a particularly high-grade intercept 51 feet long that contained 6.99 percent copper, 7.60 percent zinc, 0.014 ounce of gold per ton, and 1.80 ounce of silver per ton (www.amemining.com/properties/niblack_project/ ; Jan. 26. 2004).

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks. Slack and others (2002) also demonstrate that the volcanogenic massive-sulfide deposits in the Niblack area are of Silurian or Ordovician age.

Alteration:

Not specifically noted, but probably typical of volcanogenic massive-sulfide deposits.

Age of mineralization:

Silurian or Ordovician.

Deposit model:

Besshi-type volcanogenic Ag-Au-Cu massive-sulfide deposit (Cox and Singer, 1986; model 24b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

24b

Production Status: None

Site Status: Active

Workings/exploration:

There was considerable work on the Dama prospect from 1903 to 1905; the workings included a 250-foot tunnel with about 200 feet of drifts and crosscuts, a 40-foot-deep shaft, and several trenches. The Dama prospect is within an area about a mile square southeast of the old Niblack Mine (CR216) that has been intermittently active since the 1970's, and currently (2004) is being explored. At least one hole was diamond drilled on the Dama prospect in 1995.

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1902; Wright and Wright, 1908; Twenhofel and others, 1949; Herreid, 1964; Berg and Cobb, 1967;

Peek, 1975; Eberlein and others, 1983; Brewer, 1989; Green and others, 1989; Lac Minerals USA Incorporated, 1989; Maas and others, 1991; Roppel, 1991; Gehrels, 1992; Maas and others, 1992; Maas and others, 1995; Brew, 1996; Swainbank and others, 1998; Swainbank and others, 2002; Slack and others, 2002.

Primary reference: Maas and others, 1995

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

Site name(s): Unnamed (near Black Point)

Site type: Prospect

ARDF no.: CR224

Latitude: 55.0403 **Quadrangle:** CR A-1

Longitude: 132.0863

Location description and accuracy:

This prospect is near Black Point, about 0.4 mile east of the northwest corner of section 12, T. 79 S., R. 88 E.

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals:

Geologic description:

Smith (1914) described this prospect as a short adit and a flooded shaft. He notes a 'lead,' but provides no information about the ore or gangue minerals. The host rock is agglomerate or other pyroclastic rock that trends east and dips south; black shale and slate are nearby.

The age of the rocks in the area has been variously interpreted. Eberlein and others (1983) mapped the strata as locally metamorphosed graywacke of Silurian or Ordovician age, near a large Paleozoic or Mesozoic granitic intrusion. Gehrels (1992) and Maas and others (1995) mapped them as pre-Ordovician metamorphosed volcanic and sedimentary rocks near a Silurian or Ordovician granitic intrusion. Brew (1996) called them Late Proterozoic and Cambrian Wales Group schist, phyllite, and marble, near a Tertiary granitic intrusion of intermediate composition. Most recently, Slack and others (2002) and S.M. Karl (oral communication, 2003) mapped the strata as Silurian and Ordovician, low-grade, regionally metamorphosed sedimentary and volcanic rocks.

Alteration:

Age of mineralization:

If there is a mineral deposit at this site, it probably is the same age or younger than the Silurian or Ordovician host rocks.

Deposit model:

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

The only workings are a short adit and a shallow shaft.

Production notes:

Reserves:

Additional comments:

References:

Smith, 1914; Cobb, 1978; Eberlein and others, 1983; Gehrels, 1992; Maas and others, 1995; Brew, 1996; Slack and others, 2002.

Primary reference: Smith, 1914

Reporter(s): D.J. Grybeck (Applied Geology)

Last report date: 1-May-04

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