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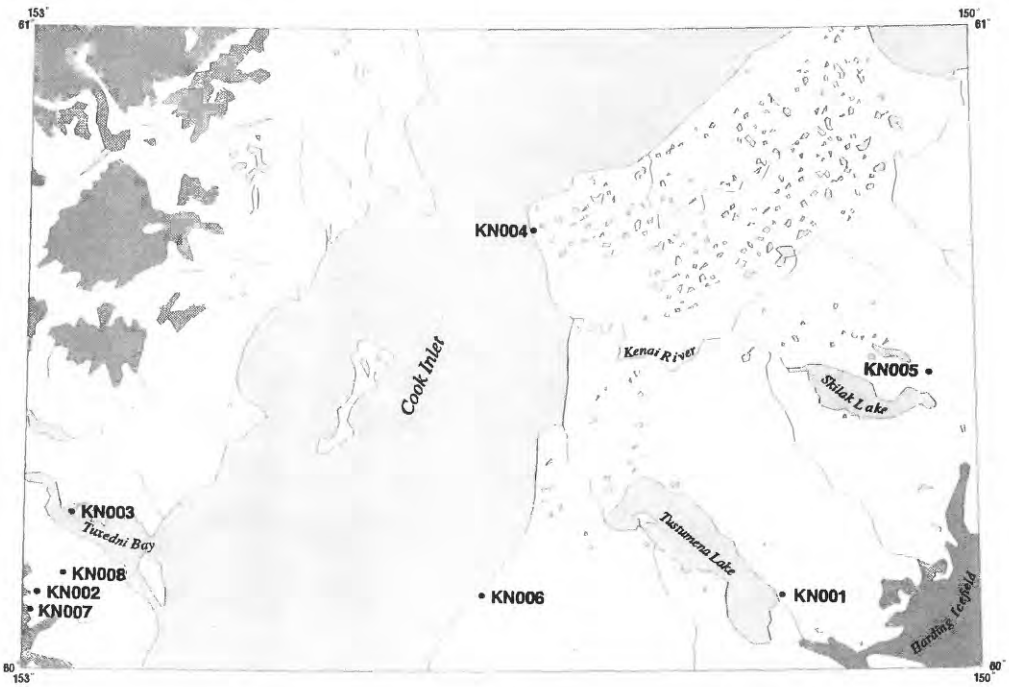
Alaska Resource Data File

Kenai 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 Kenai 1:250,000-scale quadrangle, southcentral Alaska

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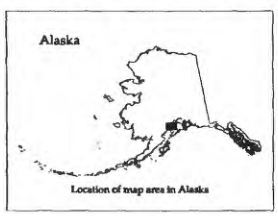

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OPEN-FILE REPORT 99-393

Site name(s): Indian Creek

Site type: Mine

ARDF no.: KN001

Latitude: 60.119 **Quadrangle:** KN A-2

Longitude: 150.616

Location description and accuracy:
Indian Creek drains into Tustumena Lake in the NW1/4 of section 2, T. 1 S., R. 8 W., of the Seward Meridian. This is Cobb's (1972, MF-377) location 6 and is accurate to within a quarter of a mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
Small amounts of gold occur in stratified glacial-fluvial gravels at the mouth of Indian Creek canyon. In 1903 an elaborate hydraulic plant was assembled at the site, but was not profitable to operate. It was subsequently abandoned (Martin and other, 1915).

Alteration:
None.

Age of mineralization:
Quaternary.

Deposit model:
Placer Au (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Small-scale placer mining occurred for several years prior to 1903. In 1903 an elaborate hydraulic plant was assembled at the site, but was not profitable to operate and was abandoned (Martin and others, 1915).

Production notes:

This propsect is within the Kenai National Wildlife Refuge; the area is now closed to mineral entry.

Reserves:

Additional comments:

References:

Brooks, 1904; Moffit, 1906; Martin and others, 1915; Cobb, 1973 (B 1374); MacKevett and Holloway, 1977; Cobb, 1979 (OFR 80-86).

Primary reference: Martin and others, 1915

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 03/07/99

Site name(s): Johnson; Johnson River

Site type: Prospect

ARDF no.: KN002

Latitude: 60.121 **Quadrangle:** KN A-8

Longitude: 152.954

Location description and accuracy:

The Johnson River prospect is located at an elevation of 1,500 feet on the northwest side of Hill 3050 overlooking the mouth of the Johnson Glacier, it is in the NW1/4 of section 6, T. 1 S., R. 21 W., of the Seward Meridian. This location is accurate to within 300 feet.

Commodities:

Main: Au, Cu, Pb, Zn

Other:

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

Gangue minerals: Anhydrite, barite, chlorite, sericite

Geologic description:

The Johnson River prospect occurs within the lower Jurassic Talkeetna Formation, an approximately 2,575 meter thick sequence of volcanic and volcaniclastic rocks (Determan and Hartsock, 1966). The volcanic section near the prospect is structurally bounded on the west by the Bruin Bay Fault, a major fault system traceable for over 500 kilometers. On the east, the volcanics are unconformably overlain by upper Jurassic marine sediments (Determan and Hartsock, 1965). The Talkeetna Formation is intruded by rocks of the Aleutian range -Talkeetna Mountain plutonic belt approximately 23 km. southwest of the prospect. These intrusives which consist dominantly of coarse-grained quartz diorites and quartz monzonites have been dated between 175 and 145 m.y. (Steefel, 1987).

At the Johnson River Prospect, the Talkeetna Formation has been divided into three major groups (Steefel, 1987). The lowest group consist of purple and green andesite flows and breccia which locally show well-developed pillows. The middle group that host the mineralization, consists of coarse-grain felsic breccias, reworked volcaniclastic rocks, crystal tuffs, and dacite flows. The upper group consists of polymitic andesitic breccias and conglomerates with minor andesitic flows. Informally, the middle group has been named the Johnson unit (Steefel, 1987). Numerous structures within the unit including turbidites and reverse graded bedding indicate a subaqueous origin.

The mineralization and alteration at Johnson River can be subdivided into two stages which are mineralogically, chemically, and temporally distinct. Stage one is an early stage of nodular anhydrite and pyrite accompanied by magnesisum-chlorite, sericite, montmorillonite, and calcite. This stage is either geochemically barren or weakly anomalous in base metals and gold. (Steefel, 1987). Stage two which includes all the high-grade mineralization consists of quartz-sulfide mineralization accompanied by iron-chlorite, sericite, barite, carbonate, and vein-type anhydrite. Sulfide mineralization consists of early pale-colored sphalerite, later dark sphalerite, galena, chalcopyrite, pyrite, and native gold. The highest grade gold concentration is associated with chalcopyrite (Steefel, 1987). Overall the stage two, quartz-sulfide mineralization occurs in a fractured controlled, steeply plunging, pipe-like stockwork zone that measures 160 meters long by 50 meters wide and extends to a depth of at least 250 meters (Bill Ellis, personal communcation,1999).

Alteration:

The alteration at Johnson River can be divide into two main events. An early stage of nodular anhydrite and fine-grained disseminated pyrite is accompanied by Mg-chlorite, sericite, monmorillonite and or calcite. This alteration is either barren or weakly anomalous in base metal mineralization. The later alteration consists of silicification and sulfidation accompanied by iron-chlorite, sericite, barite, carbonate, and vein anhydrite. This stage alteration includes all the mineralization at Johnson River (Steefel, 1987).

Age of mineralization:

Early Jurassic.

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: Inactive

Workings/exploration:

The deposit was discovered in 1975 by RAA as part of a regional exploration program. Anaconda Minerals acquired the prospect in 1981, and did detailed mapping, geophysics, geochemistry, and drilled 44 core drill holes (Bill Ellis, personal communcation, 1999). This work defined a 160 meter long by 50 meters wide and 250 meters deep fault bounded, quartz-sulfide orebody. Additional drilling was done by Howard Keck in 1990 and 1991. As of 1997, the prospect contained a drilled out reserve (at $50.00 per ton cut-off) of 1,099,580 tons that contain 0.32 ounces of gold per ton, 0.24 ounces of silver per ton, 0.76% copper, 1.17% lead and 8.73% zinc (Swainbank and others, 1997).

Production notes:

Reserves:

As of 1997, the prospect contained a drilled out reserve at ($50.00 per ton cutoff) of 1,099,580 tons that contain 0.32 ounces of gold per ton, 0.24 ounces of silver per ton, 0.76% copper, 1.17% lead and 8.73% zinc (Swainbank and others, 1997).

Additional comments:

This prospect is owned by Cook Region Native Association.

References:

Detterman, Reed, and Lamphere, 1965; Detterman and Hartsock, 1966; Steefel, 1987; Nokleberg and others, 1987; Swainbank and others, 1997.

Primary reference: Steefel, 1987

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 04/15/99

Site name(s): Trachsel; Snug Harbor

Site type: Occurrence

ARDF no.: KN003

Latitude: 60.246 **Quadrangle:** KN A-8

Longitude: 152.851

Location description and accuracy:

Magnetic Island is at the mouth of Tuxedni River, which is on the west side of Cook Inlet, due west of Ninilchik. The island can be accessed by small boat or seaplane. However, the trip should only be attempted at high tide and under favorable weather conditions since most of Tuxedni Bay is dry at low tide. There are two magnetite occurrences on the island, one on the east and one on the west side. This is Cobb's (1972, MF-377) location 1 and is accurate to within 300 feet.

Commodities:

Main: Fe

Other:

Ore minerals: Magnetite

Gangue minerals: Garnet, pyroxene

Geologic description:

Magnetite Island consists of metamorphosed volcanic rocks of Early Jurassic Talkeetna Formation and an Upper Triassic marble that has been subjected to contact metamorphism by Jurassic quartz diorite associated with the Alaska-Aleution Range batholith (Grantz, 1956). There are two magnetite occurrences on the island. The western occurrence consists of a single lens of magnetite garnet skarn. The skarn appears to be about 35 feet wide and is exposed for about 55 feet along strike. A reconnaissance dip -needle traverse indicated the total strike length of the body is about 110 feet. This exposed skarn strikes N40E and dips 40SE. The hanging wall of the skarn is a white medium grain marble of Upper Triassic age which has been recrystallized by contact metamorphism. The foot wall of this occurrence is hornfelsed siltstone and volcanic rock of the Talkeetna Formation. The contact between the marble and the hornfels is unclear but it may be a fault (Grantz, 1956).

The eastern occurrence consists of magnetite disseminated in hornfels, probably derived from volcanic rocks. The magnetite occurs in two parallel zones. The upper zone is about 30 feet thick and is separated from the lower zone by 20 feet of hornfelsed volcanics. The lower zone is at least 10 feet thick but its base is not exposed. The mineralized

zones strike approximately N35 to 45E and dip 45SE. The magnetite in the eastern zone is disseminated in a matrix of garnet, diopside, chlorite, and plagioclase. No zoning of the skarn minerals are reported. An assay from the upper zone contained 25.8% iron and 0.01% sulfur. However, about one-fifth of the iron may occur in silicate minerals (Grantz, 1956).

Alteration:
Hornfels and metasomatic alteration are present in this occurrence.

Age of mineralization:
Jurassic; hornfels related to Intrusion of Jurassic quartz diorite.

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

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

Production Status: No

Site Status: Inactive

Workings/exploration:
Small excavation in sea cave at the western deposit contains 25% to 50% iron.

Production notes:

Reserves:
Up to several thousand tons in zones with 20 to 75% magnetite (Grantz, 1956).

Additional comments:

References:
Martin, 1920; Brooks, 1921; Moffit, 1927; Grantz, 1956; Detterman and Hartsock, 1966; Berg and Cobb, 1967; MacKevett and Holloway, 1977; Cobb, 1972 (MF-377); Cobb, 1979 (OFR 80-86).

Primary reference: Grantz, 1956

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 03/01/99

Site name(s): Nikiska #1

Site type: Prospect

ARDF no.: KN004

Latitude: 60.689 **Quadrangle:** KN C-4

Longitude: 151.393

Location description and accuracy:

Numerous small occurrences are found near Cabin Lake, Nikiski Wharf and Salamatof Village. The main deposit and the only site identified as being of sufficient extent and purity to warrant possible economic interest is located 10 1/2 miles north of Kenai, Alaska within section 21, T. 7 N., R. 12 W., of the Seward Meridian. This location is accurate to a quarter of a mile.

Commodities:

Main: Diatomaceous earth

Other:

Ore minerals:

Gangue minerals:

Geologic description:

The entire northwest Kenai Peninsula is underlain by glacial outwash sediments which were deposited between 8,000 to 14,000 years ago (Pewe and others, 1953). Overlying the outwash sediments, locally there are up to 13 feet of older lake sediments consisting of layered silts and clays. The diatomaceous earth deposits locally overlie the lake sediments and range from less than 2 feet to over 12 feet thick. When wet, diatomaceous earth is a mottled brown to green color with a jelly-like consistency. In contrast, the dried material is massive, very light weight, chalk white to buff color, and friable. Dried samples contained by weight 65 to 75 percent recent fresh-water diatoms. The most common forms identified were Stephanodiscus, Melosira, and Cybella. The remainder of the diatomaceous earth is composed of 13 percent organic matter and between 10 to 20 percent wind deposited silts and clays (Plakfer, 1956).

Alteration:

Age of mineralization:

Recent.

Deposit model:
Diatomaceous earth above lake sediments

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

Production Status: No

Site Status: Inactive

Workings/exploration:
Twenty-five auger-core samples were taken in 1952. The samples contained 65 to 75 percent (by weight) of dry diatomaceous earth (Plafker, 1956).

Production notes:

Reserves:
The deposit contains 210,000 cubic yards of material containing about 70,000 tons of diatomaceous earth (Plafker, 1956).

Additional comments:

References:
Plafker, 1956; Cobb, 1979 (OFR 80-86).

Primary reference: Plafker, 1956

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 03/03/99

Site name(s): Unnamed (along the Kenai River)

Site type: Occurrence

ARDF no.: KN005

Latitude: 60.461 **Quadrangle:** KN B-1

Longitude: 150.145

Location description and accuracy:
The occurrence is about two miles north of the head of Skilak Lake, on the north bank of the Kenai River in the SE1/4 of section 4, T. 4 N., R. 5 W., of the Seward Meridian. This is Cobb's (1972, MF-377) location 2 and is accurate to within a quarter of a mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
The bedrock is the Cretaceous Valdez Group metasediments (MacKevett and Holloway, 1977). Small quantities of gold have been recovered from the upper part of glacial-fluvial gravel benches along the banks of the Kenai River (Martin and others, 1915). Gold from the Kenai River valley is very fine, light, and flaky, and has a value of about $17.58 per ounce (with gold at $20.67 per ounce)(Martin and others, 1915, p.199).

Alteration:

Age of mineralization:
Quaternary.

Deposit model:
Placer Au (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Some placer mining was done at turn of century; and the river was dredged between 1903 and 1915.

Production notes:

Reserves:

Additional comments:

This site is within a wilderness area and is now closed to mineral entry.

References:

Moffit, 1906; Martin and others, 1915; Cobb, 1972 (MF-397); MacKevett and Holloway, 1977; Cobb, 1979 (OFR 80-86).

Primary reference: Cobb, 1979

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 02/25/99

Site name(s): Ninilchik

Site type: Occurrence

ARDF no.: KN006

Latitude: 60.12 **Quadrangle:** KN A-5

Longitude: 151.56

Location description and accuracy:
Cobb (1972, MF-377) located this occurrence on the shores of Cook Inlet about six miles northeast of the town of Ninilchik. However, small amounts of gold are probably present in small amounts along the entire beach at this vicinity. This is Cobb's (1972, MF-377) location 5 and is accurate to within a half a mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
Gold has been found along the shoreline in a thin gravel layer about 2 feet below the surface. The area was mined intermittently from 1889 to 1911, mostly by rocker and small sluice boxes. The gold is probably derived from the Kenai Formation; the lode source was far to the east (Martin and others, 1915).

Alteration:

Age of mineralization:
Recent.

Deposit model:
Beach placer Au (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Beach mining was reported in the summer of 1911 but the results are not known (Martin and others, 1915). No commercial production has ever been reported from this area.

Production notes:

Reserves:

Additional comments:

References:

Martin and others, 1915; Cobb, 1972 (MF-377); Cobb, 1973 (B 1374); MacKevett and Holloway, 1977; Cobb, 1979 (OFR 80-86).

Primary reference: Martin and others, 1915

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 03/04/99

Site name(s): Double Glacier

Site type: Occurrence

ARDF no.: KN007

Latitude: 60.093 **Quadrangle:** KN A-8

Longitude: 152.976

Location description and accuracy:
This occurrence is located near the mouth of Double Glacier in section 13, T. 1 S., R. 22 W., of the Seward Meridian. The occurrence is at an elevation of about 1,000 feet.

Commodities:

Main: Au, Cu, Zn

Other:

Ore minerals: Gold, pyrite, sphalerite

Gangue minerals: Barite, calcite, gypsum, quartz

Geologic description:
The Double Glacier occurrence is within the lower Jurassic Talkeetna Formation, an approximately 2,575 meter thick sequence of volcanic and volcaniclastic rocks (Determan and Hartsock, 1966). The volcanic section near the prospect is structurally bounded on the west by the Bruin Bay Fault, a major fault system traceable for over 500 kilometers. On the east, the volcanics are unconformably overlain by upper Jurassic marine sediments (Determan and Hartsock, 1965). The Talkeetna Formation is intruded by rocks of the Aleutian range -Talkeetna Mountain plutonic belt approximately 23 km. southwest of the prospect. These intrusives which consist dominantly of coarse-grained quartz diorites and quartz monzonites have been dated between 175 and 145 m.y. (Steefel, 1987).

At the Double Glacier occurrence, the Talkeetna Formation has been divided into three major groups (Steefel, 1987). The lowest group consist of purple and green andesite flows and breccia which locally show well-developed pillows. The middle group that host the mineralization, consists of coarse-grain felsic breccias, reworked volcaniclastic rocks, crystal tuff, and dacite flows. The upper group consist of polymitic andesitic breccias and conglomerates with andesitic flows. Informally, the middle group has been named the Johnson unit (Steefel, 1987). Numerous structures within the unit including turbidites and reverse graded bedding indicate a subaqueous origin.

The mineralization consists of strataform massive sulfide layers and lens which contain pyrite, chalcopyrite, and sphalerite. There are no published assay results for this occurrence William Ellis (personal communcation, 1999) speculates that this occurrence is an

upper portion of a Kuroko type massive sulfide deposit.

Alteration:
The Double Glacier occurence has alteration characteristics of a Kuroko type massive sulfide deposit that include sulfate alteration and silification.

Age of mineralization:
Jurassic massive sulfide.

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: Inactive

Workings/exploration:
The occurence was discovered by Anaconda Minerals in 1982 as part of an exploration program at the Johnson River prospect. To date there has been detailed mapping, stream and soil geochemical surveys, and surface trenching and sampling. No assay results are avaible.

Production notes:

Reserves:

Additional comments:
This occurrence is owned by Cook Region Native Association.

References:
Steefel, 1987; Swainbank and others, 1997.

Primary reference:

Reporter(s): Jeff A. Huber (Anchorage)

Last report date:

Site name(s): Difficult Creek

Site type: Occurrence

ARDF no.: KN008

Latitude: 60.151 **Quadrangle:** KN A-8

Longitude: 152.875

Location description and accuracy:

The occurrence located on a small ridge at an elevation of 1,850 feet overlooking Difficult Creek , it is in NE1/4 of section 26, T. 1 N., R. 20 W., of the Seward Meridian. Difficult Creek drains into Tuxedni Bay which is on the west side of Cook Inlet. This location is accurate to within 300 feet.

Commodities:

Main: Au, Cu, Zn

Other:

Ore minerals: Chalcopyrite, gold, pyrite, sphalerite

Gangue minerals: Anhydrite, barite, calcite, quartz

Geologic description:

The Difficult Creek occurrence is within the lower Jurassic Talkeetna Formation, an approximately 2,575 meter thick sequence of volcanic and volcaniclastic rocks (Determan and Hartsock, 1966). The volcanic section near the prospect is structurally bounded on the west by the Bruin Bay Fault, a major fault system traceable for over 500 kilometers. On the east, the volcanics are unconformably overlain by upper Jurassic marine sediments (Determan and Hartsock, 1965). The Talkeetna Formation is intruded by rocks of the Aleutian range -Talkeetna Mountain plutonic belt approximately 23 km southwest of the prospect. These intrusives which consist dominantly of coarse-grained quartz diorites and quartz monzonites have been dated between 175 and 145 m.y. (Steefel, 1987).

At Difficult Creek, the Talkeetna Formation has been divided into three major groups (Steefel, 1987). The lowest group consist of purple and green andesite flows and breccia which locally show well-developed pillows. The middle group that host the mineralization, consists of coarse-grain felsic breccias, reworked volcaniclastic rocks, crystal tuffs, and dacite flows. The upper group consists of polymitic andesitic breccias and conglomerates with minor amounts of andesitic flows.

The mineralization consists of strataform massive sulfides layers and lens which contain pyrite, chalcopyrite and sphalerite. There are no published assay results for this occurrence. William Ellis (personal communication, 1999) speculates that this occurrence is a

Kuroko type massive sulfide deposit.

Alteration:
The Difficult Creek occurrence has alteration characteristics of a Kuroko type massive sulfide deposit that includes sulfate alteration, and silification.

Age of mineralization:
Jurassic massive sulfide.

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: Inactive

Workings/exploration:
The occurrence was discovered by Anaconda Minerals in 1982 as part of a exploration program at the Johnson River prospect. To date there has been detailed mapping, stream and soil geochemical surveys, and surface trenching and sampling. No assay results are available.

Production notes:

Reserves:

Additional comments:
This occurrence is owned by Cook Region Native Association.

References:
Detterman, Reed, and Lamphere, 1965; Detterman and Hartsock, 1966; Steefel, 1987; Swainbank and others, 1997.

Primary reference:

Reporter(s): Jeff A. Huber (Anchorage)

Last report date: 4/15/99

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