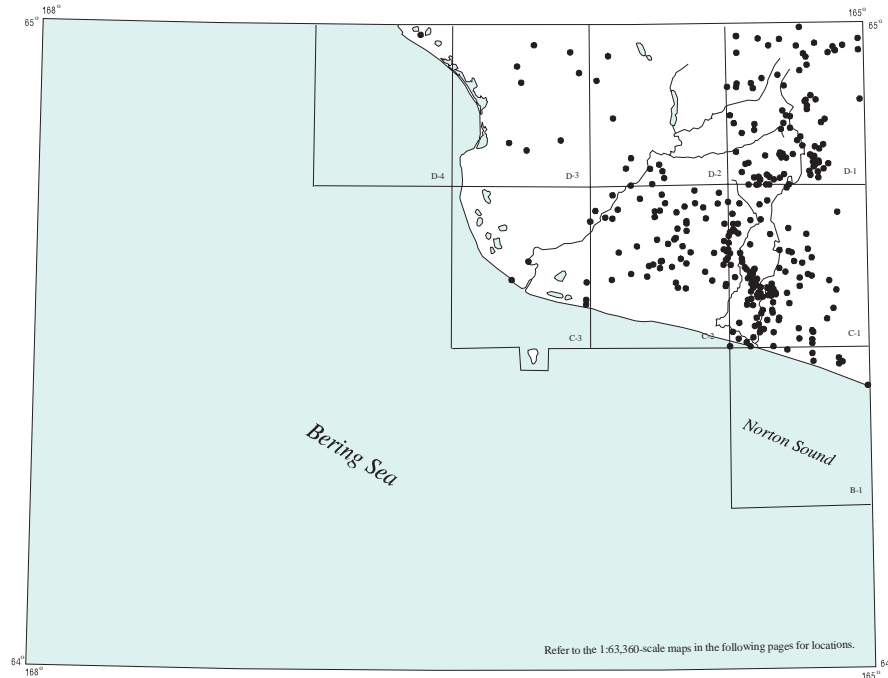


Nome quadrangle

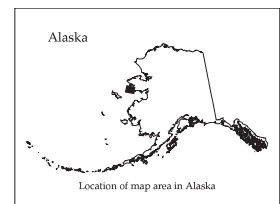
Descriptions of the mineral occurrences shown on the accompanying figure follow. See U.S. Geological Survey (1996) for a description of the information content of each field in the records. The data presented here are maintained as part of a statewide database on mines, prospects and mineral occurrences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



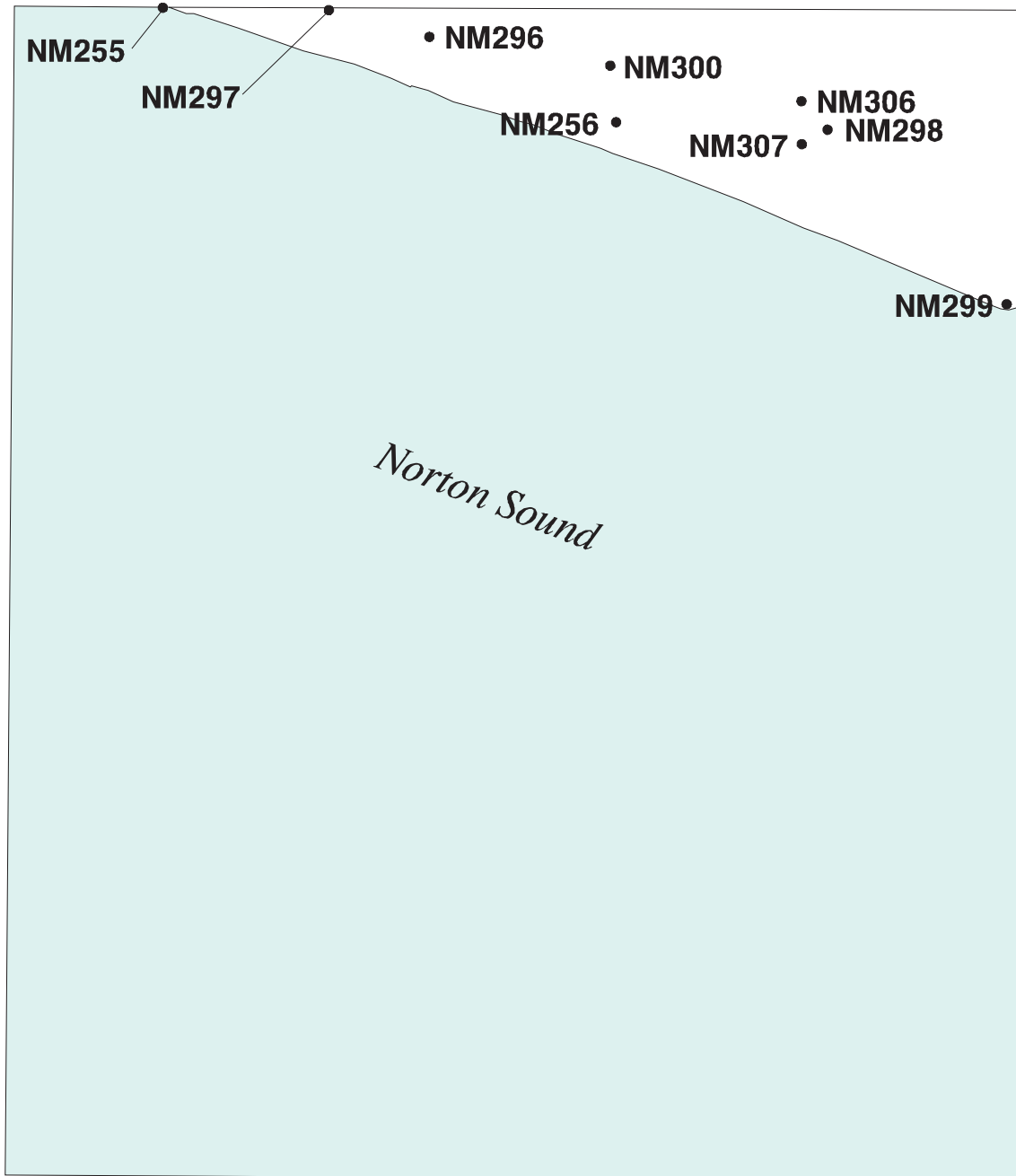
*Distribution of mineral occurrences in the Nome
1:250,000-scale quadrangle, Alaska*

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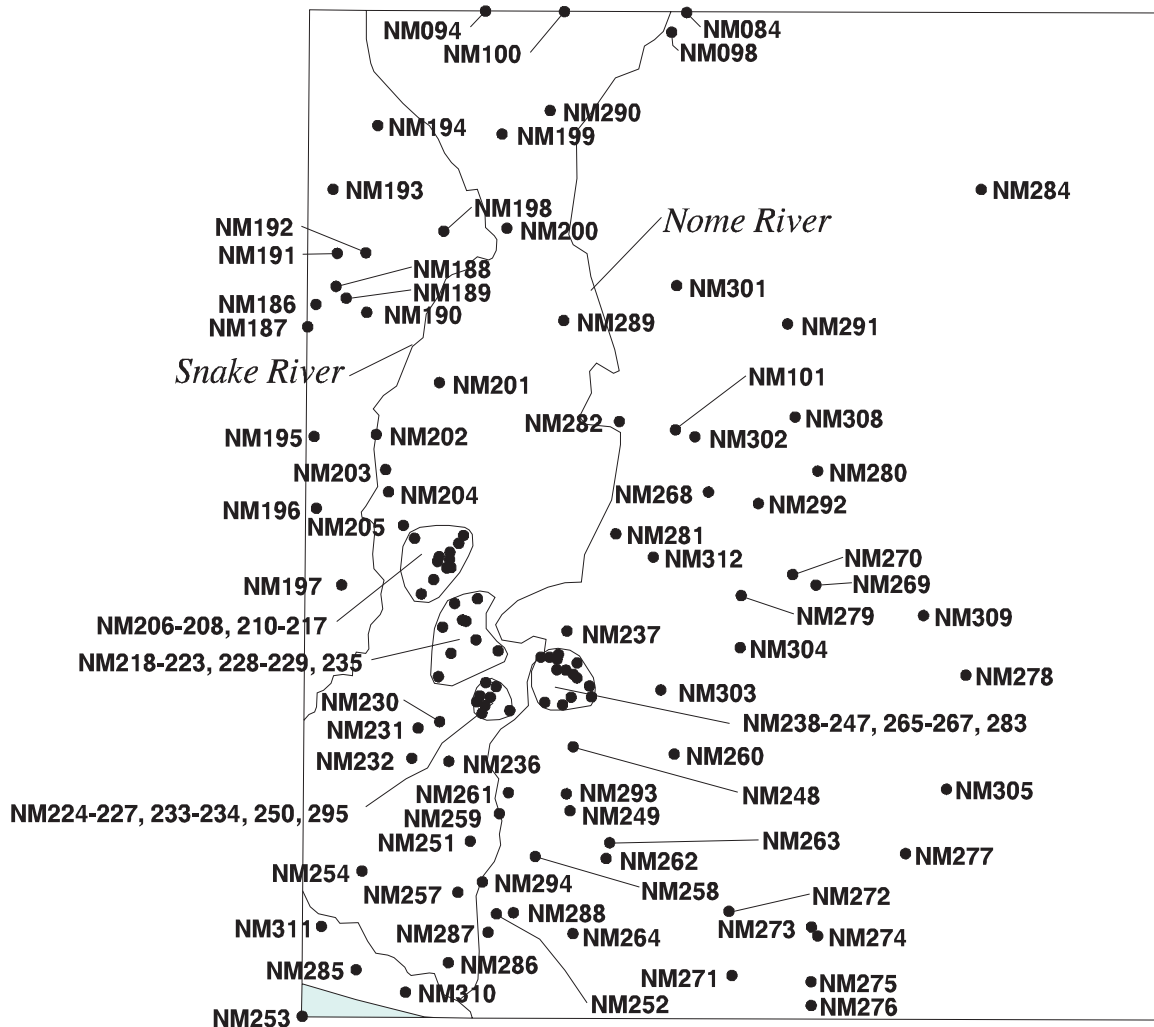
C.C. Hawley, Anchorage, AK
and
Travis L. Hudson, Sequim, WA



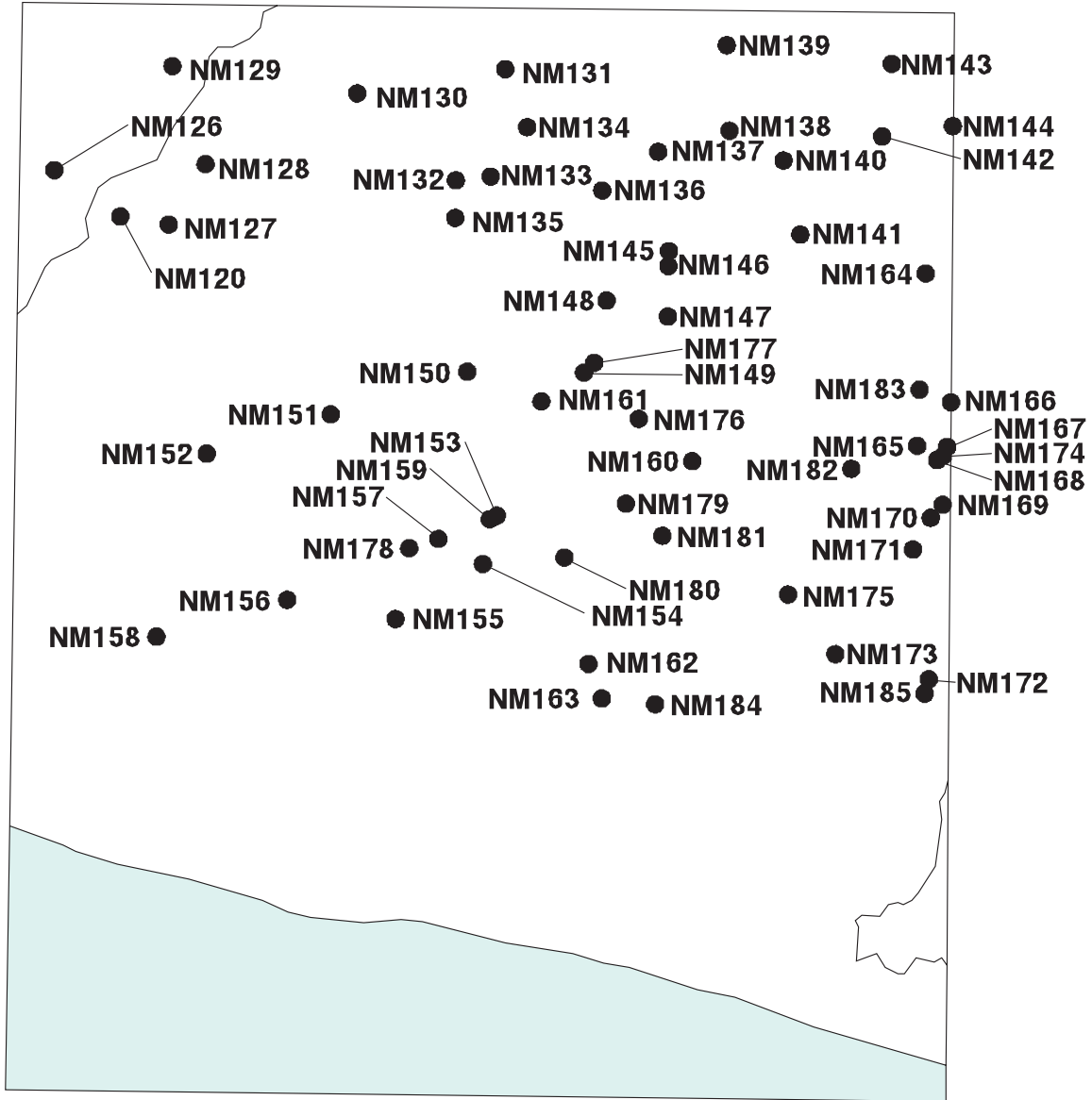
This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.



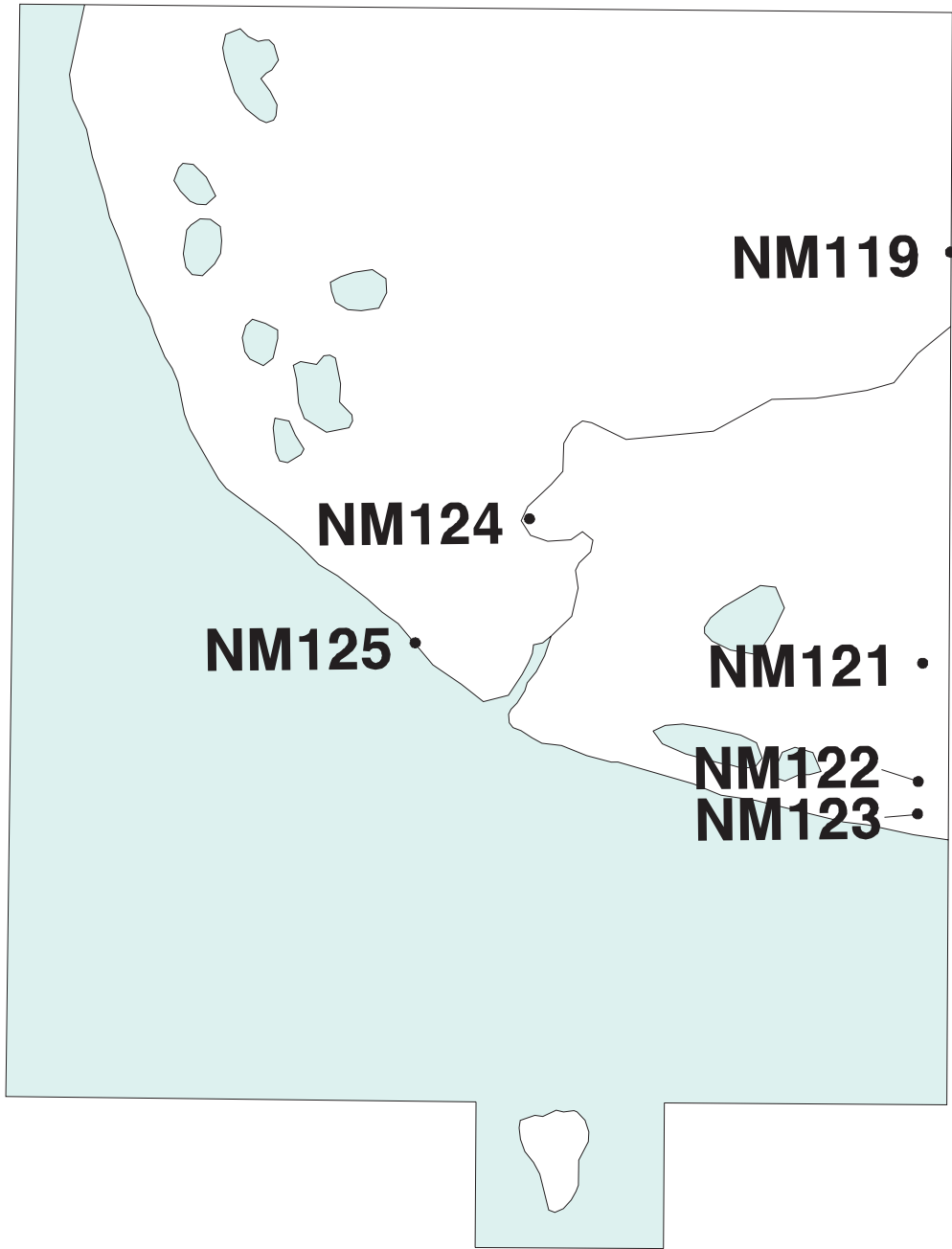
Nome B-1 quadrangle



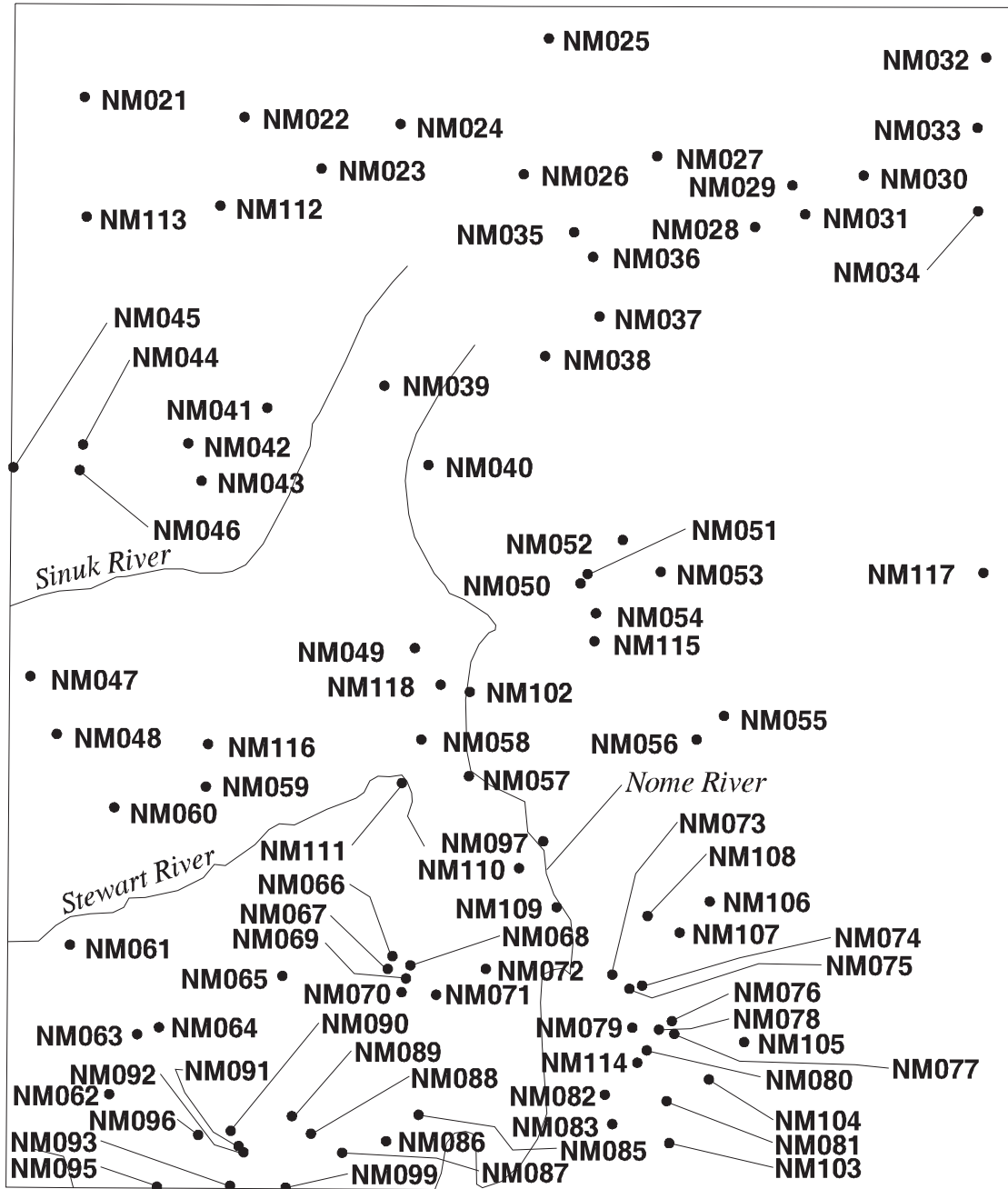
Nome C-1 quadrangle



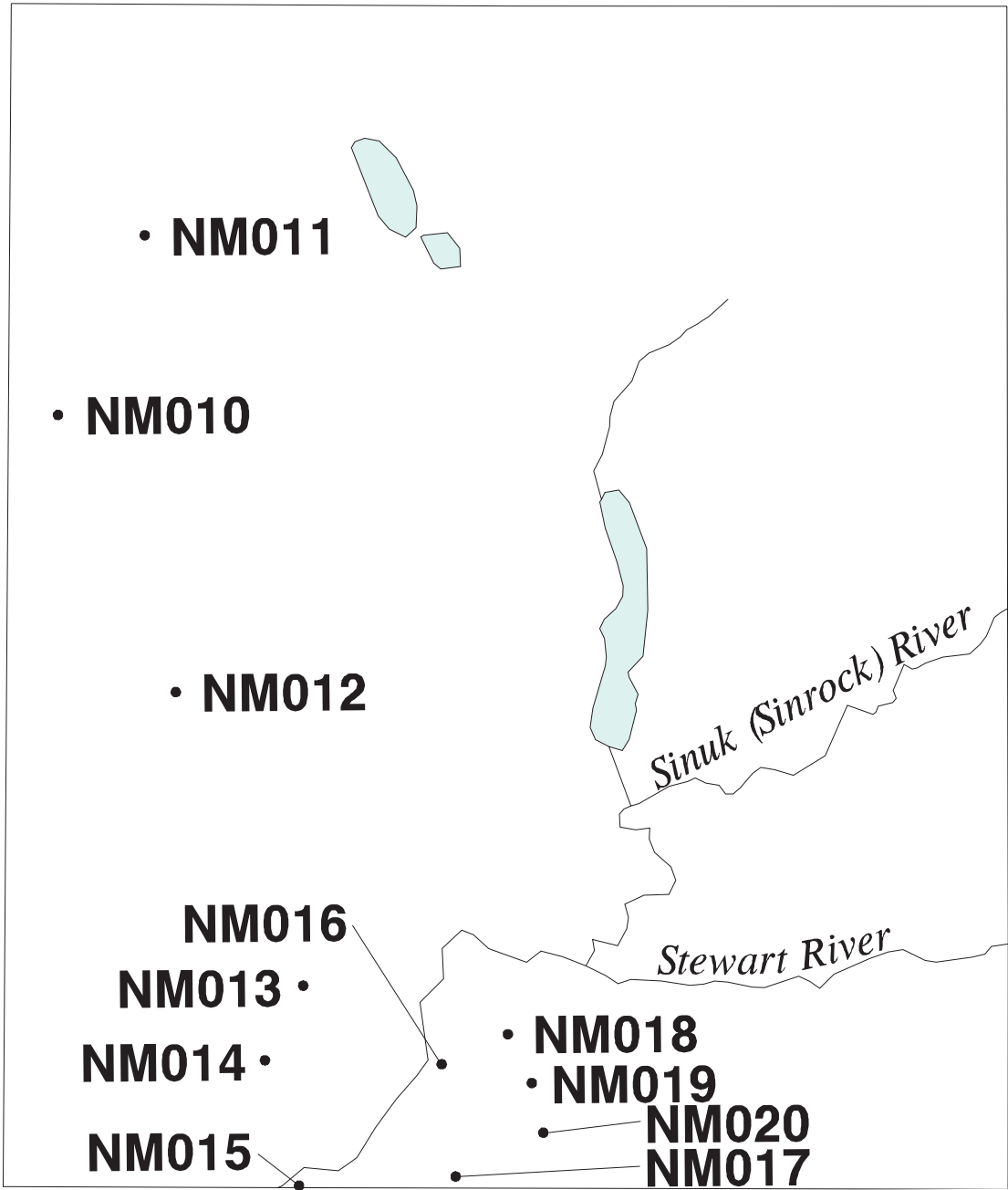
Nome C-2 quadrangle



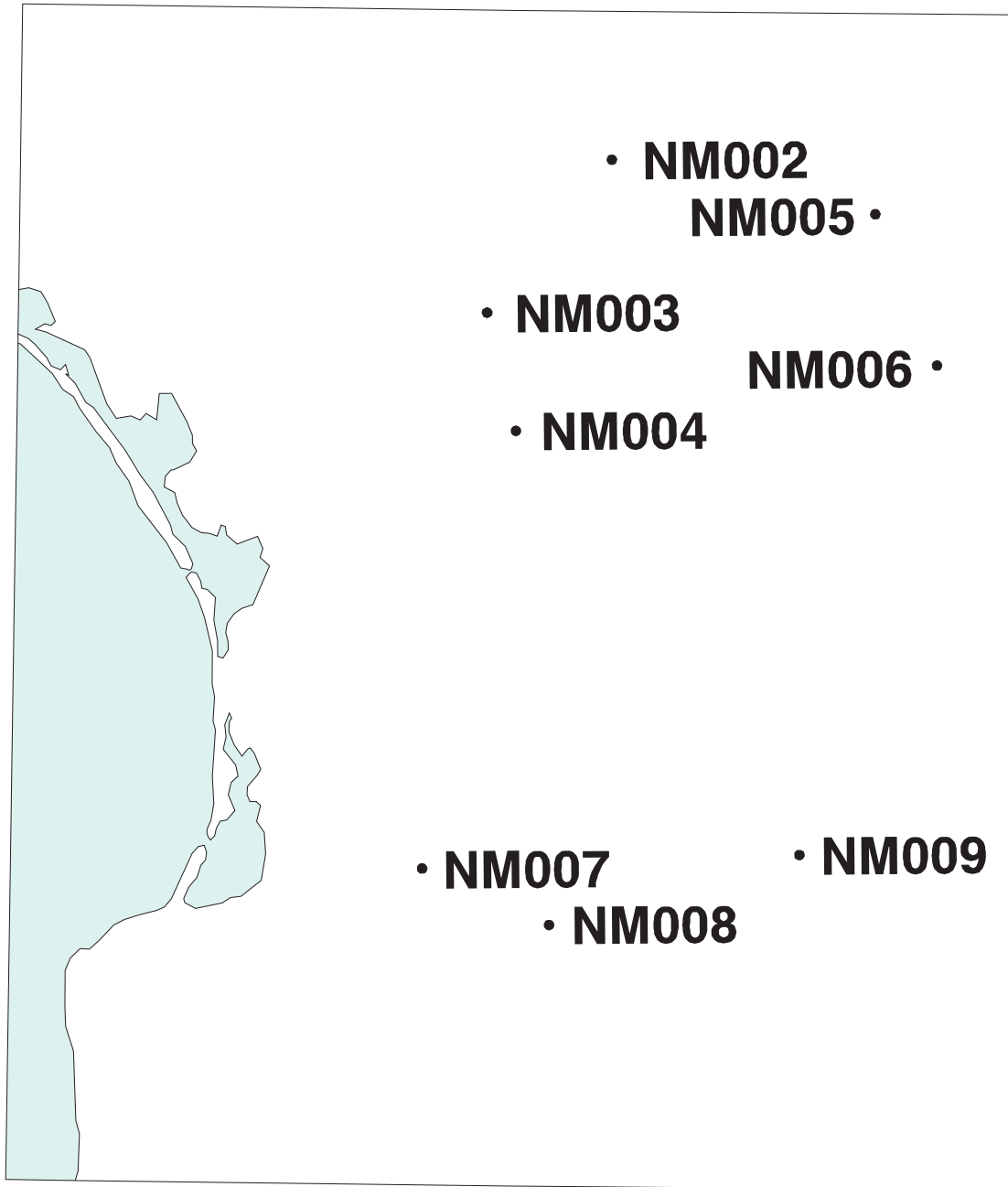
Nome C-3 quadrangle



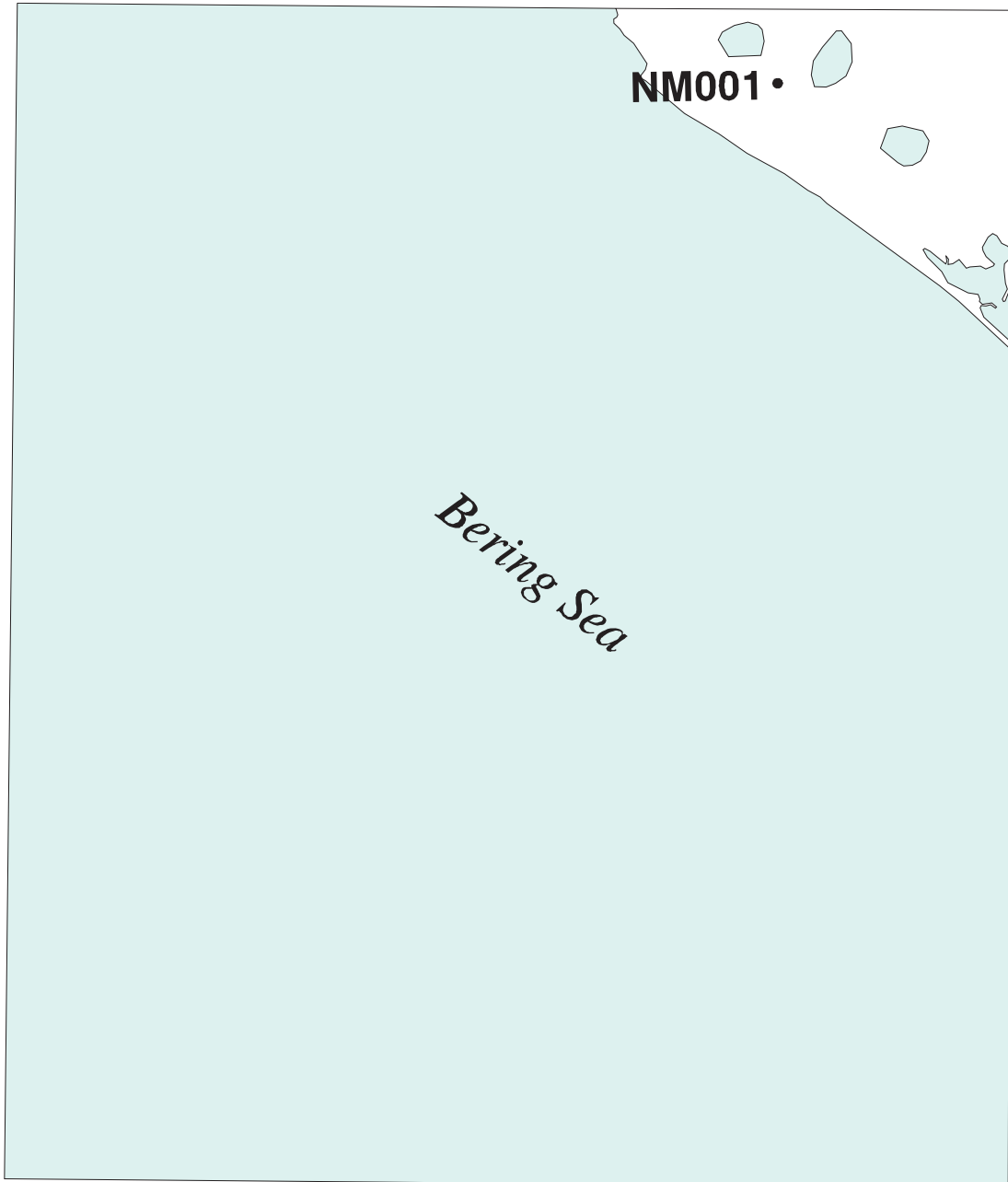
Nome D-1 quadrangle



Nome D-2 quadrangle



Nome D-3 quadrangle



Nome D-4 quadrangle

Site name(s): Sourdough Creek**Site type:** Occurrence**ARDF no.:** NM001**Latitude:** 64.9843**Quadrangle:** NM D-4**Longitude:** 166.6175**Location description and accuracy:**

Sourdough Creek flows across the coastal plain about 2 to 3 miles east of Cape Douglas and enters a coastal lagoon about 6 miles southeast of Cape Douglas. Collier and others (1908, plate X) show the creek as auriferous over a 4- to 5-mile length in the Teller A-4 and Nome D-4 quadrangles. The location given is the approximate mid-point of the auriferous section in the Nome D-4 quadrangle. The creek has very little relief, and it is difficult to identify the exact location from the generalized map of Collier and others (1908).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Collier and others (1908, plate X) describe Sourdough Creek as possibly auriferous over a 4- to 5-mile length on the Teller A-4 and Nome D-4 quadrangles. Collier panned one gold color on Sourdough Creek in 1901 (Collier and others, 1908, p. 220). In part on the basis of its location near the coastal plain and the stream's low relief, it is inferred that placer gold deposits would be of river-bar type with local enrichment in point bars and in inner curves of meanders, probably in association with black or ruby sand. Sourdough Creek probably reworks coastal plain deposits over its lower course, but its headwaters are in uplands underlain by a pelitic schist assemblage (Sainsbury, Hummel and Hudson, 1972).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Probably some exploration by pan or rocker before WWI.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Tisuk River**Site type:** Occurrence**ARDF no.:** NM002**Latitude:** 64.9685**Quadrangle:** NM D-3**Longitude:** 166.2031**Location description and accuracy:**

Tisuk River is a major drainage with headwaters in the southwest Kigluaik Mountains. It was reported as auriferous over approximately 4 miles where it leaves the Kigluaik Mountains and flows across the coastal plain. The location used here is the approximate midpoint of the auriferous part of the river (Collier and others, 1908, Plate X); it is just downstream from where the Nome-Teller road crosses the river.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Collier and others (1908, plate X) show a several-mile stretch of Tisuk River above the coastal plain as auriferous but without productive placer deposits. The auriferous part of the river has a flood plain at least one-half mile wide. Gold deposits are likely to be point bar and meander-like concentrations produced in recent times and of transient nature. Bedrock, exposed at least locally along most of Tisuk River above the coastal plain, is primarily a mafic metavolcanic assemblage (Sainsbury, Smith, and Kachadoorian, 1972).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Probably some exploration by pan or rocker before WWI.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Sainsbury, Smith, and Kachadoorian, 1972.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nolan Creek**Site type:** Mine**ARDF no.:** NM003**Latitude:** 64.9357**Quadrangle:** NM D-3**Longitude:** 166.2649**Location description and accuracy:**

Nolan Creek appears to be the placer mine site described by Collier and others (1908) as 'a small southern tributary of Tisuk River, name not known, 6 miles from the coast'. Nolan Creek is the only south tributary for a several-mile stretch above Seattle (or Wesley) Creek, which was named at the time of Collier's visit. The location is uncertain, but it is probably known within about a half-mile.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Five feet of gravel that contained 3 to 10 cents gold per pan, was reported to be present in the lower part of the creek near the Tisuk River flood plain (Collier and others, 1908, p. 220). The ground was idle when examined by Collier in 1903 but reportedly produced from 3 to 10 dollars per day per man by rocker, hence was richer than Hume (NM004) and Tomboy (NM008) Creeks also described by Collier and his associates in the same general region. Bedrock, exposed at least locally along most of Tisuk River and tributaries such as Nolan Creek, is primarily a mafic metavolcanic assemblage (Sainsbury, Smith, and Kachadoorian, 1972).

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:** Probably inactive**Workings/exploration:**

Placer gold mining was done by rocker before 1903.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Sainsbury, Smith, and Kachadoorian, 1972.

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Wesley Creek (formerly Hume Creek)

Site type: Mine

ARDF no.: NM004

Latitude: 64.9106

Quadrangle: NM D-3

Longitude: 166.2498

Location description and accuracy:

This mine, formerly called Hume Creek (Collier and others, 1908), is about a mile above the mouth of Wesley Creek, an east tributary to Seattle Creek. It is about 1.5 miles southwest of the mouth of Seattle Creek on Tisuk River and is 1.5 miles west of the Nome-Teller road. Seattle Creek was shown as Wesley Creek on some older maps. The mine is locality 2 of Hummel (1975) and locality 56 of Cobb (1972 [MF463]; 1978 [OFR 78-93]). The mine is located within about 1,000 feet.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Placer gold deposits were worked on Wesley Creek (formerly Hume Creek) with rockers in 1901 and returned 2 to 3 dollars per man per day. Pay gravel was angular chlorite and graphitic schist, with gneiss and granite boulders, covered by about 6 feet of moss and muck (Collier and others, 1908). Bedrock in the area of Wesley Creek is primarily a mafic metavolcanic assemblage (Sainsbury, Smith, and Kachadoorian, 1972).

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:

Small scale placer gold mining by rocker took place on this creek in 1901.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Sainsbury, Smith, and Kachadoorian, 1972; Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (on Martha Creek)**Site type:** Occurrence**ARDF no.:** NM005**Latitude:** 64.9574**Quadrangle:** NM D-3**Longitude:** 166.0706**Location description and accuracy:**

Occurrences of sulfidized rock were reported by Sainsbury, Smith, and Kachadoorian (1972) about 1.5 miles south of the confluence of Martha Creek with Tisuk River. The best occurrences were reported to be on the west side of Martha Creek. The occurrences are approximately located but probably within about a quarter of a mile of the coordinates.

Commodities:**Main:** Bi, Cu, Pb**Other:****Ore minerals:** Limonite**Gangue minerals:** Quartz**Geologic description:**

Several oxidized (limonitic?) quartz-breccia zones, as much as 100 feet across, occur in this area, especially on the west side of Martha Creek (Sainsbury, Smith, and Kachadoorian, 1972). Anomalous amounts of bismuth, copper, and lead were reported.

The area is underlain by amphibolite facies graphitic metasedimentary rocks that are locally gneissic in character. Sainsbury, Smith, and Kachadoorian (1972) mapped granite stocks and felsic dikes in the Martha Creek drainage and a small tourmalinized granite about three-quarters of a mile west of these occurrences. The tourmalinized granite is at the head of a creek that parallels Martha Creek and also flows north to Tisuk River. The amphibolite facies metasedimentary rocks are now considered to have a late Proterozoic or early Paleozoic protolith (Till and Dumoulin, 1994; Hannula and others, 1995), perhaps correlative with parts of the Nome Group. Like the Nome Group, these rocks probably underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others,

1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

Alteration:

Oxidation and silicification.

Age of mineralization:

Cretaceous, probably related to nearby or buried tourmalinized granites.

Deposit model:

Quartz breccia in amphibolite facies metasedimentary rocks.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

No workings were reported; occurrences were found by Sainsbury and his coauthors Smith, and Kachadoorian (1972) during reconnaissance in 1970.

Production notes:**Reserves:****Additional comments:****References:**

Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Smith, and Kachadoorian, 1972; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Hudson, 1994; Till and Dumoulin, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and others, 1994; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Sainsbury, Smith, and Kachadoorian, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near upper Martha Creek)

Site type: Occurrence

ARDF no.: NM006

Latitude: 64.9253

Quadrangle: NM D-3

Longitude: 166.0391

Location description and accuracy:

The occurrence is in the headwaters of Martha Creek, a south tributary to Tisuk River. It is on the west side of a divide between Martha Creek and Tisuk River at an elevation of 1,650 feet. It is about 0.4 mile north of saddle 1570 and located to within about 1,000 feet.

Commodities:

Main: Ag, Bi, Pb, Sb, Sn, W

Other: B, Be, Mo

Ore minerals:

Gangue minerals: Quartz, tourmaline (?)

Geologic description:

Sulfide-bearing rocks occur on a northwest-striking fault, which cuts quartz-graphite-biotite gneiss, at the contact of the gneiss with a gneissic marble layer. The occurrence is about 2.4 miles upstream from weakly mineralized quartz-breccia zones exposed along lower Martha Creek (NM005) and 2 miles northwest of the fluorite pipe in 'Fluorite Creek' (a local name assigned by Sainsbury, Smith, and Kachadoorian, 1970; NM010). The occurrences are generally in an area of small tourmalinized granite plugs of Cretaceous age.

At this locality, Smith (in Sainsbury, Smith, and Kachadoorian, 1972) collected a sulfide-bearing rock sample (67Ats118) that contained 30 ppm silver, 15,000 ppm boron, 5,000 ppm bismuth, 7 ppm beryllium, 70 ppm molybdenum, 10,000 ppm lead, 1,500 ppm antimony, 300 ppm tin and 500 ppm tungsten. The presence of elevated boron values suggests that the rocks are tourmalinized.

The area is underlain by amphibolite facies graphitic metasedimentary rocks that are locally gneissic. Sainsbury, Smith and Kachadoorian (1972) mapped granite stocks and felsic dikes in the Martha Creek drainage including several that are tourmalinized. The amphibolite facies metasedimentary rocks are now considered to have a late Proterozoic or early Paleozoic protolith (Till and Dumoulin, 1994; Hannula and others, 1995), perhaps correlative with parts of the Nome Group. Like the Nome Group, these rocks probably

underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

Alteration:

Tourmalinization?

Age of mineralization:

Cretaceous; post mid-Cretaceous amphibolite facies metamorphism and possibly the same age as mineralized Cretaceous granitic rocks in the area.

Deposit model:

Polymetallic, sulfide-bearing vein in amphibolite facies metasedimentary rocks.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The occurrence is a surface exposure of sulfide-bearing rock.

Production notes:**Reserves:****Additional comments:****References:**

Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Smith, and Kachadoorian, 1972; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Hudson, 1994; Till and Dumoulin, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and others, 1994; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Sainsbury, Smith, and Kachadoorian, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Fairview Creek**Site type:** Prospect**ARDF no.:** NM007**Latitude:** 64.8173**Quadrangle:** NM D-3**Longitude:** 166.2943**Location description and accuracy:**

Fairview Creek flows west-northwest to its mouth in a lagoon at the Bering Sea coast about 3.5 miles northeast of Cape Woolley. The location given is the approximate mid-point of placer mining claims shown in State of Alaska files (Heiner and Porter, 1972). The gold-bearing part of Fairview Creek extends for about 3 miles below an unnamed mined tributary informally called Tomboy Creek (NM008). This is locality 57 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Gold colors were reported to be locally present on Fairview Creek by Collier and others (1908), and placer mining claims have been located over about 3 miles of its length (Heiner and Porter, 1972). Fairview Creek is wider and more braided downstream where it flows onto the coastal plain. Concentrations of gold, in company with black or ruby sands, would be likely to occur in river bars or points where river velocity changes.

Fairview Creek flows near a contact between metavolcanic and metasedimentary units, but it also reworks glacial deposits along its central portion and headwaters (Sainsbury, Smith, and Kachadoorian, 1972). Gold in Fairview Creek may have a somewhat distant source, although the paystreak on its tributary, Tomboy Creek (NM008), was on decomposed chloritic schist bedrock, a possible bedrock source.

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: Undetermined

Site Status: Probably inactive

Workings/exploration:

Exploration by pan and rocker back to about 1900. Placer mining claims were active as recently as 1972.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Heiner and Porter, 1972; Sainsbury, Smith, and Kachadoorian, 1972; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Tomboy Creek**Site type:** Mine**ARDF no.:** NM008**Latitude:** 64.8056**Quadrangle:** NM D-3**Longitude:** 166.2306**Location description and accuracy:**

Tomboy Creek is an old name for a north tributary of Fairview Creek (NM007); this name is not shown on the current USGS topographic map of the area. The confluence of Tomboy Creek and Fairview Creek is about 4 miles above the mouth of the Fairview Creek on a coastal lagoon along the the Bering Sea. The mine location is 0.6 miles upstream of the mouth of Tomboy Creek and about 4.5 miles southwest of where the Nome-Teller road crosses the Feather River. The mine is locality 1 of Hummel (1975) and locality 58 of Cobb (1972 [MF463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining took place on Tomboy Creek in 1902; the U.S. Geological Survey obtained pans of about 1.5 cents or 2.25 dollars per cubic yard from decomposed schist bedrock (Collier and others, 1908, p. 219). The overlying several feet of gravel contains numerous pebbles and cobbles of granitic bedrock reworked from glacial deposits that originated in the Kigilauik Mountains. The source of the gold is unknown. The area to the north of the mine is extensively covered by glacial deposits. Near the mine, Sainsbury, Smith, and Kachadoorian (1972) mapped a strong northwest-trending fault, which separates graphitic schist to the south from chloritic, metavolcanic rocks near this mine.

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:

Surface workings only; small-scale mining by hand in 1902.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Sainsbury, Smith, and Kachadoorian, 1972; Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Livingston Creek

Site type: Mine

ARDF no.: NM009

Latitude: 64.8210

Quadrangle: NM D-3

Longitude: 166.1060

Location description and accuracy:

Livingston Creek is a southeast tributary of the Feather River. It joins the Feather River about 2 miles west of the Nome-Teller road. The creek has had placer mining claims over its lower 3 miles (Heiner and Porter, 1972, p. 162). The location given is the approximate mid-point of the portion of the creek where claims were staked.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Livingston Creek has had placer mining claims over its lower 3 miles (Heiner and Porter, 1972, p. 162). The creek mostly flows over glacial deposits derived from the Kigluaik Mountains (Sainsbury, Smith, and Kachadoorian, 1972). Any placer gold deposits that are present are probably reworked glacial deposits.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Some exploration probably accompanied the staking of placer mining claims on the creek.

Production notes:

Reserves:

Additional comments:

References:

Heiner and Porter, 1972; Sainsbury, Smith, and Kachadoorian, 1972.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near 'Fluorite Creek')

Site type: Occurrence

ARDF no.: NM010

Latitude: 64.9131

Quadrangle: NM D-2

Longitude: 165.9751

Location description and accuracy:

Fluorite Creek was a local name assigned by Sainsbury, Kachadoorian, and Smith (1970) to an upper tributary to Tisuk River in the NW1/4 section 4, T. 7 S., R. 36 W., Kateel River Meridian. The occurrence is at an elevation of about 1,800 feet and located within about 1,000 feet of the coordinates.

Commodities:

Main: F

Other: Ag, Mo

Ore minerals: Fluorite, pyrite, pyrrhotite

Gangue minerals: Quartz

Geologic description:

Fluorite was found in two breccia pipes at this locality (Sainsbury, Kachadoorian, and Smith, 1970). The easternmost pipe is 40 to 60 percent fluorite and 20 feet wide; it consists of a central core of crystalline fluorite surrounded by a margin of banded silica and fluorite with pyrite. Locally this breccia is silicified, pyritized, and cemented by fluorite. The central fluorite-rich core is cut by iron-stained veinlets 0.25 to 0.5 inch thick. The second pipe, located 350 feet west of the first, is smaller and more pyritized and contains a higher percentage of silicified breccia. A large fault, spatially associated with the pipes, is marked by a 30- to 40-foot-wide jasperoid containing a few percent fluorite. A sample of the pyrite-bearing jasperoid breccia contained 3 ppm silver and 70 ppm molybdenum; no gold was detected. The wall rock along normal faults in the general area are mineralized with pyrrhotite, pyrite, and traces of other sulfides.

Mid-Cretaceous granite stocks and felsic dikes are common in the western Kigluaik Mountains where they intrude amphibolite facies metasedimentary schist and gneiss (Sainsbury, Smith, and Kachadoorian, 1972). The metasedimentary rocks are derived from a late Proterozoic or early Paleozoic protolith (Till and Dumoulin, 1994; Hannula and others, 1995), perhaps correlative with parts of the Nome Group. Like the Nome Group, these rocks probably underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes

and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Fluorite and silica replacement.

Age of mineralization:

Cretaceous; breccias crosscut mid-Cretaceous amphibolite facies metamorphic rocks and may be related to Cretaceous granitic rocks in the area.

Deposit model:

Fluorite breccia pipe in amphibolite facies metasedimentary rocks.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Only natural surface exposures are present.

Production notes:**Reserves:****Additional comments:****References:**

Sainsbury, Kachadoorian, and Smith, 1970; Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Smith, and Kachadoorian, 1972; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Till and Dumoulin, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and others, 1994; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Sainsbury, Kachadoorian, and Smith, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Canyon Creek**Site type:** Prospect**ARDF no.:** NM011**Latitude:** 64.9512**Quadrangle:** NM D-2**Longitude:** 165.9322**Location description and accuracy:**

Canyon Creek is a major drainage in the western Kigluaik Mountains. Placer mining claims were reported along about 6 miles of the stream and the location given is the approximate mid-point of the claimed area This is Kardex site Kx 52-89 of Heiner and Porter (1972, p. 162).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Canyon Creek is a major drainage in the western Kigluaik Mountains. Placer mining claims were reported along about 6 miles of the stream, and the location given is the approximate mid-point of the claimed area shown as Kardex site Kx 52-89 by Heiner and Porter (1972, p. 162). Smith (1930 [B 810-A]) reported prospecting activity on one locality in 1927. The creek is in a broad glacially sculpted valley. Placer gold deposits are probably of transient river-bar type derived from undiscovered lodes in the Kigluaik Mountains. Bedrock in this area is mostly amphibolite facies metasedimentary rocks (Sainsbury, Hummel, and Hudson, 1972; Till and Dumoulin, 1994; Hannula and others, 1995).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

Production Status: Undetermined

Site Status: Inactive

Workings/exploration:

Exploration work has probably only been by pan or rocker; some gold may have been produced at one locality in 1927 (Smith, 1930, B 810-A, p. 36).

Production notes:

Reserves:

Additional comments:

References:

Smith, 1930 (B 810-A); Heiner and Porter, 1972; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Till and Dumoulin, 1994; Hannula and others, 1995.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Johnston Creek**Site type:** Prospect**ARDF no.:** NM012**Latitude:** 64.8547**Quadrangle:** NM D-2**Longitude:** 165.9154**Location description and accuracy:**

Johnston Creek is a headwater tributary of the Feather River. The creek rises on the southwest flank of the Kigluaik Mountains and parallels the uppermost course of the Feather River, which is the next stream to the west. The location given is the approximate midpoint of placer mining claims shown as Kardex site Kx 52-87 of Heiner and Porter (1972).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Johnston Creek occupies a glacial valley on the southwest flank of the Kigluaik Mountains. Placer mining claims have been located on the creek (Kardex site Kx 52-87, Heiner and Porter, 1972), but placer gold deposits are probably of river-bar type and transient in nature. Bedrock in this area is mostly amphibolite facies metasedimentary rocks (Sainsbury, Hummel, and Hudson, 1972; Till and Dumoulin, 1994; Hannula and others, 1995).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: Undetermined

Site Status: Undetermined

Workings/exploration:

Probably surface mining only by rocker or small-scale sluicing.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Heiner and Porter, 1972; Till and Dumoulin, 1994; Hannula and others, 1995.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near American Creek)**Site type:** Occurrence**ARDF no.:** NM013**Latitude:** 64.7928**Quadrangle:** NM D-2**Longitude:** 165.8511**Location description and accuracy:**

The occurrence is on hill 375 about 1.5 miles west-northwest of the confluence of American Creek and Sinuk River. It is in the SW1/4 section 18, T. 8 S., R. 35 W., Kateel River Meridian. The location of this occurrence is taken from figure 3 of Mulligan and Hess (1965).

Commodities:**Main:** Fe**Other:****Ore minerals:** Goethite, hematite, limonite, pyrite (?), pyrolusite**Gangue minerals:** Calcite, dolomite (?), quartz**Geologic description:**

This occurrence near lower American Creek was shown on figure 3 of Mulligan and Hess (1965, but no other data are available for this specific occurrence. It appears to be the northern-most of a group of iron-rich prospects that include NM014, NM017, NM018, NM019, and NM020. On the basis of data from the other prospects, this occurrence is probably a limonite (goethite) concentration in marble. The limonite can be massive to granular, botryoidal, mamillary, or fibrous in texture. The iron content ranges to as much as 59 percent (Eakin, 1915 [B 622-I, p. 361-365]). Hematite, pyrolusite, and calcite are present locally.

This occurrence and other iron deposits of the Sinuk River area are at or near the base of massive marble whose protolith is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high-angle faults or folds, but they are in general crudely stratabound within the basal massive marble or underlying calc-schist (Mulligan and Hess, 1965; Herreid, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie, 1918 [B662-I, p. 425-449]; Cathcart, 1922; Mulligan and

Hess, 1965; Herreid, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits that are probably transitional into lead-zinc-barite deposits from the same approximate stratigraphic position, as at the Quarry (NM135).

The age of the iron deposits of the Sinuk River area is most likely post-mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important control on them. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) because this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). The youngest possible age appears to be Early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Probable dolomitization and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Carbonate-hosted, iron oxide deposit.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Some shallow prospecting pits may be present here.

Production notes:**Reserves:****Additional comments:****References:**

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Mulligan and Hess, 1965

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): American**Site type:** Prospect**ARDF no.:** NM014**Latitude:** 64.7770**Quadrangle:** NM D-2**Longitude:** 165.8700**Location description and accuracy:**

The American prospect is on a north-sloping face of a hill about 1 mile south of American Creek at an elevation of 600 feet. The prospect is about 2 miles west of a south-flowing part of Sinuk River and 2.3 miles northeast of a low divide near hill 660 on the Nome-Teller road. The location shown is taken from Herreid (1970) and is accurate within about 500 feet. This is locality 1 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe**Other:** Au, Mn, Zn**Ore minerals:** Goethite, limonite, pyrite**Gangue minerals:** Dolomite, quartz**Geologic description:**

Extensive amounts of limonite occur near a contact between marble and schist, probably along a high-angle fault that strikes west and is nearly coincident with the lithologic contact (Herreid, 197, figure 8). Surface rubble locally contains more than 30 percent goethite. The goethite-bearing rocks are associated with crackled dolomite and bleached, very light colored calcitic marble. The largest goethite-rich mass is about 600 feet long and as much as 150 feet across. The general iron-rich zone is about 1,800 feet long. The American lode is probably the second largest iron occurrence in the area, second only to the Monarch prospect (NM017). According to Shallit (1942), there are about 40,000 long tons of rock here that contain between 20 and 40 percent iron. Some of the deposit is anomalous in zinc. Herreid (1970, Appendix II) found as much as 800 ppm in zinc in soil samples collected north of the iron accumulation. One sample of silicified schist from this locality contained 0.06 ppm gold (Herreid, 1970). The host rock to the iron accumulation is primarily marble and some intercalated metasedimentary schist.

This prospect and other iron deposits of the Sinuk River area are at or near the base of massive marble whose protolith age is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high angle faults or folds but they are in general crudely stratabound within the basal mas-

sive marble or underlying calc-schist (Mulligan and Hess, 1965; Herreid, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie; 1918 [B 662-I, p. 425-449]; Cathcart, 1922; Mulligan and Hess, 1965; Herreid, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits that are transitional to some of the lead-zinc-barite deposits (as at the Quarry prospect, NM135) at the same stratigraphic horizon.

The age of the iron deposits of the Sinuk River area is most likely post mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important control on them. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) as this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). (Fluorite is abundant at the Quarry prospect.) The youngest possible age appears to be early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Dolomitization, silicification, and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Iron deposit localized by marble-schist contact and intersecting fault.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

A few surface prospecting pits to 6 or 8 feet deep are present here.

Production notes:**Reserves:**

Shallit (1942) estimated that 40,000 long tons of rock are present that contain 20 to 40 percent iron with minor manganese (also see Mulligan and Hess, 1965, p. 18).

Additional comments:

References:

Eakin, 1915 (B 622-I); Mertie, 1918; Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Sinuk River**Site type:** Prospects**ARDF no.:** NM015**Latitude:** 64.7505**Quadrangle:** NM D-2**Longitude:** 165.8527**Location description and accuracy:**

Sinuk River is the major drainage along the southwest flank of the Kigluaik Mountains. Collier and others (1908, plate X) show the river to be gold-bearing for several miles downstream from Rulby Creek, a small east tributary (NM016). This location is the approximate midpoint of the auriferous section that extends south into the Nome C-2 quadrangle.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Sinuk River is the major drainage along the southwest flank of the Kigluaik Mountains. Collier and others (1908, plate X) show the river to be gold-bearing for several miles downstream from Rulby Creek, a small east tributary (NM016). The placer deposits on Sinuk River itself are probably of river-bar type and transient in nature. The headward limit of the auriferous portion of the river is about where a belt of iron and lead-zinc deposits (NM014, NM014, NM017, NM018, NM019, and NM020) cross the river. Bedrock is not commonly exposed along Sinuk River, and over much of its length it reworks glacial deposits derived from the Kigluaik Mountains (Sainsbury, Hummel, and Hudson, 1972; Kaufman and others, 1989).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: Undetermined**Site Status:** Probably inactive**Workings/exploration:**

Sinuk River was probably worked on a small scale prior to WWI. Production figures are not available, but some gold was probably produced by pan, rocker, or other small-scale operations.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Kaufman and others, 1989.

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Rulby Creek**Site type:** Mine**ARDF no.:** NM016**Latitude:** 64.7763**Quadrangle:** NM D-2**Longitude:** 165.7820**Location description and accuracy:**

Rulby Creek is a small east tributary to Sinuk River (NM015). The mouth of Rulby Creek is 0.6 mile downstream of the mouth of American Creek. It is locality 68 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Rulby Creek was prospected and produced a little placer gold in the early 1900's (Collier and others, 1908). The creek flows across a higher gravel deposit, probably glacial, that carries small amounts of gold. This locality is within an area of iron and related base metal mineralization (NM014, NM014, NM017, NM018, NM019, and NM020) that locally includes some anomalous gold values (for example, NM014).

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 gold was produced by pan, rocker, or other small scale operations in the early 1900's.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Monarch**Site type:** Prospect**ARDF no.:** NM017**Latitude:** 64.7526**Quadrangle:** NM D-2**Longitude:** 165.7749**Location description and accuracy:**

The Monarch prospect is at the head of an unnamed northwest-flowing tributary of the Sinuk River. It is mainly in the W1/2 section 33, T. 8 S., R. 35 W., Kateel River Meridian. It is 1.5 miles southwest of the Mogul prospect (NM020) and accurately located. It is locality 3 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe**Other:** Au, Mn, Pb, Zn**Ore minerals:** Goethite, hematite, limonite, pyrolusite**Gangue minerals:** Dolomite**Geologic description:**

The Monarch prospect occurs in marble overlying mica schist; it is the largest of the iron deposits of the Sinuk River region. The main Monarch prospect (called the East Gap) contains abundant limonite and some hematite in an area about 2,000 feet long and about 700 feet across. High-grade iron ore, about 50 percent or more iron, is contained within a lower grade zone about 3,000 feet long and as much as 1,500 feet across. The West Gap portion of the prospect is 1,500 feet by 300 feet and has a north-northwest trend. Exposures are poor, but some near vertical limonite veins are as much as 30 feet across and extend downward at least 12 feet. Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that there are 50,000 long tons of rock containing 30 to 45 percent iron and about 500,000 tons of rock containing 15 to 25 percent iron here. Most of the iron ore has only 1 percent or less of manganese, but Mulligan and Hess (1965, p. 14) cite one analysis indicating about 15 percent iron and 11 percent manganese. The West Gap body seems to have more manganese. A representative sample of the East Gap body contained 78.30 percent ferric oxide (about 55 percent iron) and 1.37 percent manganese oxide (Eakin, 1915, p. 363). Soil samples collected here by Herreid (1970, table II, figure 4) locally are highly anomalous in lead and zinc. One sample at the basal marble contact below the West Gap zone contained 1,000 ppm zinc. Samples over the East Gap zone contain as much as 340 ppm lead and 1,200 ppm zinc. Sample 111 from West Gap contained

280 ppm lead. The prospect appears to lie along north-trending high-angle faults (Herried, 1970).

This prospect and other iron deposits of the Sinuk River area are at or near the base of massive marble whose protolith age is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high angle faults or folds, but they are in general crudely stratabound within the basal massive marble or underlying calc-schist (Mulligan and Hess, 1965; Herried, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922; Mulligan and Hess, 1965; Herried, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits that are possibly transitional to some of the lead-zinc-barite (as at the Quarry prospect, NM135) deposits of the area.

The age of the iron deposits of the Sinuk River area is most likely post-mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important control. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) because this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). The youngest possible age appears to be Early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Dolomitization and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Carbonate-hosted, iron oxide deposit.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Open cuts, a shallow shaft, and a short adit were driven before 1914. There are at least 12 patented claims over this prospect (Mulligan and Hess, 1965).

Production notes:

Reserves:

Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that this prospect contains 50,000 long tons of 30 to 45 percent iron and about 500,000 tons of 15 to 25 percent iron. Most of the iron ore has only 1 percent or less of manganese, but Mulligan and Hess (1965, p. 14) cite one analysis indicating about 15 percent iron and 11 percent manganese. The West Gap body seems to have more manganese. A representative sample of the East Gap body contained 78.30 percent ferric oxide (about 55 percent iron) and 1.37 percent manganese oxide (Eakin, 1915, p. 363).

Additional comments:**References:**

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Tub Mountain**Site type:** Prospect**ARDF no.:** NM018**Latitude:** 64.7827**Quadrangle:** NM D-2**Longitude:** 165.7491**Location description and accuracy:**

The Tub Mountain prospect is on hill 956 in the SW1/4NW1/4 section 22, T. 8 S., R 35 W., Kateel River Meridian. It is 1.25 miles southwest of the confluence of Stewart and Sinuk Rivers and about 0.8 mile south of Sinuk River. The prospect is locality 6 of Hummel (1975) and locality 2 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe**Other:** Mn**Ore minerals:** Goethite, hematite, limonite [so called], pyrite**Gangue minerals:** Calcite, dolomite, quartz**Geologic description:**

The Tub Mountain prospect is a limonite-rich deposit about 300 by 600 feet that appears to be localized along high-angle faults in marble (Herried, 1970). It is one of several similar deposits in the area (see NM014, NM014, NM017, NM019, and NM020). The limonite can be massive to granular, botryoidal, mamillary, or fibrous. The iron content ranges to as much as 59 percent in analyzed samples (Eakin, 1915). Hematite, pyrolusite, and calcite are present locally. Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that 8,000 long tons of rock containing 10 to 20 percent iron is present at Tub Mountain.

This prospect and other iron deposits of the Sinuk River area are at or near the base of massive marble whose protolith age is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high-angle faults or folds, but they are in general crudely stratabound within the basal massive marble or underlying calc-schist (Mulligan and Hess, 1965; Herreid, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie, 1918 [B662-I, p. 425-449]; Cathcart, 1922; Mulligan and Hess,

1965; Herreid, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits probably transitional to lead-zinc-barite deposits, such as Quarry (NM135), that are at about the same stratigraphic position.

The age of the iron deposits of the Sinuk River area is most likely post-mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important ore control. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) as this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). The youngest possible age appears to be Early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Dolomitization and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Carbonate-hosted, iron oxide deposit.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Surface prospecting pits, dating to before WWI, are present.

Production notes:**Reserves:**

Shallit (1942; table 3, Mulligan and Hess, 1965) estimated that the Tub Mountain prospect includes 8,000 long tons of rock containing 10 to 20 percent iron.

Additional comments:**References:**

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (at head of Rulby Creek)

Site type: Occurrence

ARDF no.: NM019

Latitude: 64.7724

Quadrangle: NM D-2

Longitude: 165.7371

Location description and accuracy:

This occurrence is about 0.8 mile south of the Tub Mountain prospect (NM018) near the head of Rulby Creek (NM016). The occurrence is at an elevation of 760 feet and is accurately located from Herreid (1970).

Commodities:

Main: Fe

Other:

Ore minerals: Limonite

Gangue minerals:

Geologic description:

This limonite occurrence is about 0.8 mile south of the Tub Mountain prospect (NM018). It is a few hundred feet across (Herreid, 1970) and one of several carbonate-hosted, iron-rich deposits in the area (NM014, NM014, NM017, NM018, and NM020). The limonite can be massive to granular, botryoidal, mamillary, or fibrous. The iron content ranges to as much as 59 percent in analyzed samples (Eakin, 1915 [B 622-I, p. 361-365]). Hematite, pyrolusite, and calcite are present locally.

This occurrence and other iron deposits of the Sinuk River area are at or near the base of massive marble whose protolith age is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high-angle faults or folds, but they are in general crudely stratabound within the basal massive marble or underlying calc-schist (Mulligan and Hess, 1965; Herreid, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922; Mulligan and Hess, 1965; Herreid, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that

would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits that are transitional to lead-zinc-barite deposits such as the Quarry (NM135).

The age of the iron deposits of the Sinuk River area is most likely post-mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important control on them. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) because this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). The youngest possible age appears to be Early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Dolomitization and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Carbonate-hosted, iron oxide deposit.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

There may be small prospecting pits at this locality.

Production notes:**Reserves:****Additional comments:****References:**

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Mogul**Site type:** Prospect**ARDF no.:** NM020**Latitude:** 64.7619**Quadrangle:** NM D-2**Longitude:** 165.7313**Location description and accuracy:**

The Mogul prospect is on a rolling hill south of the divide between Trinity Creek to the west and Durrant Creek to the east. It is about 1.5 miles northeast of the Monarch prospect (NM017) and 1.5 miles south-southeast of the Tub Mountain prospect (NM018). The location is the approximate center of a group of limonite occurrences mapped by Herreid (1970). The location is accurate. This is locality 4 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe**Other:****Ore minerals:** Limonite**Gangue minerals:****Geologic description:**

The Mogul prospect includes four small concentrations of limonite at or near a contact of marble and schist (Herreid, 1970, figure 1). This prospect is one of several carbonate-hosted, iron-rich deposits in the area (NM014, NM014, NM017, NM018, and NM019). The limonite can be massive to granular, botryoidal, mamillary, or fibrous and commonly occurs in veins along joints and fractures in marble. The iron content ranges to as much as 59 percent in analyzed samples (Eakin, 1915 [B 622-I, p. 361-365]). Hematite, pyrolusite, and calcite are present locally. Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that the Mogul prospect contains 5,000 long tons of rock with 10 to 20 percent iron.

This prospect and other iron deposits of the Sinuk River area occur at or near the base of massive marble whose protolith age is probably lower Paleozoic (Sainsbury, Hummel, and Hudson, 1972; Bundtzen and others, 1994). The deposits are locally controlled by high-angle faults or folds, but they are in general crudely stratabound within the basal massive marble or underlying calc-schist (Mulligan and Hess, 1965; Herreid, 1970). This stratigraphic interval also hosts base metal sulfide-fluorite-barite deposits at the Galena (NM130) and Quarry prospects (NM135).

The origin and age of the iron deposits of the Sinuk River area are uncertain. The deposits may be, in part, gossan developed on oxidized sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922; Mulligan and Hess, 1965; Herreid, 1970). Several of the iron deposits, including American (NM014) and Monarch (NM017), are locally highly anomalous in zinc and lead. Arguing against a simple gossan origin is the paucity of diagnostic textures and structures in boxworks that would suggest derivation from specific sulfide minerals. Alternatively, these deposits could be hypogene iron oxide and carbonate deposits probably transitional to lead-zinc-barite deposits such as the Quarry (NM135).

The age of the iron deposits of the Sinuk River area is most likely post-mid-Cretaceous because faults that crosscut mid-Cretaceous metamorphic rocks are an important control on them. A Late Cretaceous age for the iron deposits was suggested by Brobst and others (1971) as this is the age of fluorine-rich tin granites of northwestern Seward Peninsula (Hudson and Arth, 1983). The youngest possible age appears to be Early Tertiary, when deep weathering, sandstone-type uranium mineralization, and possibly karst formation occurred to the east in the Solomon quadrangle (Hudson, 1999).

Alteration:

Dolomitization and oxidation.

Age of mineralization:

Late Cretaceous or Early Tertiary; post mid-Cretaceous metamorphism.

Deposit model:

Carbonate-hosted, iron oxide deposit.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

There may be small prospecting pits at this locality.

Production notes:**Reserves:**

Shallit (1942); Mulligan and Hess, 1965, table 3) estimated that the Mogul prospect contains 5,000 long tons of rock with 10 to 20 percent iron.

Additional comments:**References:**

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Sainsbury, Hummel, and Hud-

son, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Bundtzen and others, 1994; Hudson, 1999.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Cobblestone River)**Site type:** Occurrence**ARDF no.:** NM021**Latitude:** 64.9806**Quadrangle:** NM D-1**Longitude:** 165.4640**Location description and accuracy:**

The occurrence is on a steep ridge about 1 mile east of the Cobblestone River and about 3.3 miles north of Mosquito Pass. The occurrence is locality 114 of Hummel (1975). It is in the SE1/4 section 12, T. 6 S., R. 34 W., Kateel River Meridian at an elevation of about 2,200 feet. The occurrence is a pegmatite; it probably is located within about 1,000 feet, but may be representative of one or more pegmatite bodies that occur near this location.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This granite pegmatite is an isolated occurrence north of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998) and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and mid-Cretaceous in age (Throckmorton and Hummel, 1979;

Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Age of mineralization:

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous granulite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hummel, 1975; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985;

Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near head of Windy Creek)

Site type: Occurrence

ARDF no.: NM022

Latitude: 64.9764

Quadrangle: NM D-1

Longitude: 165.3850

Location description and accuracy:

The occurrence is on a steep ridge between the head of Windy Creek and an unnamed west-flowing tributary to the Cobblestone River. It is about 2.2 miles southwest of Mount Osborne. This is locality 113 of Hummel (1975). It is located within about 1,000 feet of the coordinates.

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

This pegmatite is an isolated occurrence north of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous granulite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hummel, 1975; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller

and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Windy Creek)**Site type:** Occurrence**ARDF no.:** NM023**Latitude:** 64.9656**Quadrangle:** NM D-1**Longitude:** 165.3465**Location description and accuracy:**

The occurrence is on the ridge crest between upper West Fork Grand Central River and the head of Windy Creek. It is at an elevation of about 2,250 feet. This is locality 12 of Hummel (1962 [MF 248]) and locality 101 of Hummel (1975).

Commodities:**Main:** Graphite**Other:****Ore minerals:** Graphite**Gangue minerals:** Biotite, feldspar, garnet, quartz, sillimanite**Geologic description:**

Graphite is disseminated in schist and with biotite in segregations as much as 18 inches thick. It also occurs as sparse disseminations in pegmatite. Moffit (1913, p. 135-136) described a graphite-rich layer 8 inches thick between pegmatite and schist walls.

The host rocks to this graphite segregation are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Age of mineralization:

Mid-Cretaceous; the age of high temperature metamorphism in the Kigluaik Mountains

Deposit model:

Lenses and disseminations of graphite in amphibolite facies metasedimentary rocks.

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:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hummel, 1975; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (in the headwaters of West Fork Grand Central River)

Site type: Occurrence

ARDF no.: NM024

Latitude: 64.9751

Quadrangle: NM D-1

Longitude: 165.3071

Location description and accuracy:

This is a pegmatite exposed on an unnamed tributary on the north side of the valley of West Fork Grand Central River. It is at an elevation of 1,500 feet and 1.1 miles southeast of Mount Osborn.

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

This pegmatite is an isolated occurrence north of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second, or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous granulite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others,

1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (east of North Fork Grand Central River)**Site type:** Occurrence**ARDF no.:** NM025**Latitude:** 64.9933**Quadrangle:** NM D-1**Longitude:** 165.2333**Location description and accuracy:**

This is a pegmatite exposed on the east side of the valley of North Fork Grand Central River. It is at 1,750 feet elevation, 2.6 miles east of Mount Osborn.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is an isolated occurrence north of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second, or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998) and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous granulite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Crater Lake)**Site type:** Occurrence**ARDF no.:** NM026**Latitude:** 64.9646**Quadrangle:** NM D-1**Longitude:** 165.2456**Location description and accuracy:**

This pegmatite is on the north-trending ridge, at an elevation of 1,600 feet, 0.3 mile east of Crater Lake and 3 miles southeast of Mount Osborn (Hummel, 1962 [MF 248]; 1975).

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is an isolated occurrence north of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second, or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are upper amphibolite facies metasedimentary rocks that are probably derived from Precambrian protolith (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous granulite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hummel, 1975; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and

Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Grand Central River)**Site type:** Occurrence**ARDF no.:** NM027**Latitude:** 64.9685**Quadrangle:** NM D-1**Longitude:** 165.1791**Location description and accuracy:**

This tactite occurrence is at an elevation of about 1,500 feet on a steep southwest-facing slope on the east side of the Grand Central River valley. It is close to the section line between sections 16 and 17, T. 6 S., R. 32 W., Kateel River Meridian. This is locality 35 of Hummel (1962, MF 248) and locality 15 of Cobb (1972 [MF 463]; 1978 [OFR 78-93]). The occurrence is probably located to within about 1,000 feet of the coordinates.

Commodities:**Main:** W**Other:****Ore minerals:** Scheelite**Gangue minerals:** Calc-silicate minerals**Geologic description:**

This is one of four tactite occurrences (this occurrence, NM035, NM041, and NM044) identified by Hummel (1961) in the central and southern Kigluaik Mountains. The calc-silicate tactite assemblages are interpreted to have been metamorphosed along with their country rocks. Scheelite is present in all four occurrences, and galena and sphalerite accompany scheelite in one (NM044).

These occurrences are in amphibolite and upper amphibolite facies metasedimentary rocks adjacent or nearby the Thompson Creek orthogneiss (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been determined to have a latest Proterozoic protolith (Amato and Wright, 1998). The upper amphibolite facies rocks, primarily north of the Thompson Creek orthogneiss, are probably derived from Precambrian protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous

(Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Recrystallized calc-silicate assemblages are expected.

Age of mineralization:

Late Proterozoic (?); may be the same age as the Thompson Creek orthogneiss.

Deposit model:

W skarn deposit (Cox and Singer, 1986; model 14a).

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

14a

Production Status:

Site Status: Probably inactive

Workings/exploration:

No workings or exploration activities are known at this locality.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1961; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Sainsbury, 1972; Cobb, 1978 (OFR 78-93); Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Gold Run)**Site type:** Occurrence**ARDF no.:** NM028**Latitude:** 64.9536**Quadrangle:** NM D-1**Longitude:** 165.1302**Location description and accuracy:**

This pegmatite is on the western end of the ridge crest south of Gold Run, an east tributary to Grand Central River. It is at 2,650 feet elevation, 1.6 miles east-northeast of the mouth of Thompson Creek.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Fox Creek)

Site type: Occurrence

ARDF no.: NM029

Latitude: 64.9624

Quadrangle: NM D-1

Longitude: 165.1116

Location description and accuracy:

This pegmatite is on the ridge crest between Gold Run and Fox Creek at an elevation of 2,750 feet. Gold Run is an east tributary to Grand Central River; Fox Creek flows south to Salmon Lake.

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998) and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Fox Creek)**Site type:** Occurrence**ARDF no.:** NM030**Latitude:** 64.9645**Quadrangle:** NM D-1**Longitude:** 165.0761**Location description and accuracy:**

This pegmatite is on a south-facing slope between headwater tributaries of Fox Creek, at an elevation of 1,750 feet. Fox Creek flows south to Salmon Lake.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high

pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Fox Creek)**Site type:** Occurrence**ARDF no.:** NM031**Latitude:** 64.9563**Quadrangle:** NM D-1**Longitude:** 165.1036**Location description and accuracy:**

This pegmatite is on the ridge crest between the headwaters of an unnamed east tributary to Grand Central River and the northwest headwaters of Fox Creek. Fox Creek flows south to Salmon Lake. This occurrence is at 2,800 feet elevation.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Warren Creek)**Site type:** Occurrence**ARDF no.:** NM032**Latitude:** 64.9565**Quadrangle:** NM D-1**Longitude:** 165.1036**Location description and accuracy:**

A cluster of pegmatites occurs on the ridge crest at the head of Warren Creek. Several pegmatites occur over a distance of about a mile along the ridge crest; the central part of the cluster is on the saddle at an elevation of 2,525 feet. Warren Creek is an east tributary to Fox Creek, which flows south to Salmon Lake.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

These pegmatites are south of the Thompson Creek orthogneiss, and their age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near these occurrences. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997; 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that

are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995;

Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Warren Creek)**Site type:** Occurrence**ARDF no.:** NM033**Latitude:** 64.9746**Quadrangle:** NM D-1**Longitude:** 165.0193**Location description and accuracy:**

This pegmatite is in the headwaters of Warren Creek at an elevation of about 1,400 feet. Warren Creek is an east tributary to Fox Creek, which flows south to Salmon Lake.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998,) and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-

pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Warren Creek)**Site type:** Occurrence**ARDF no.:** NM034**Latitude:** 64.9570**Quadrangle:** NM D-1**Longitude:** 165.0190**Location description and accuracy:**

This pegmatite is on the ridge crest between Warren and Star Creeks on a saddle at about 1,575 feet elevation. Warren Creek is an east tributary to Fox Creek which flows south to Salmon Lake.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Thompson Creek)**Site type:** Occurrence**ARDF no.:** NM035**Latitude:** 64.9524**Quadrangle:** NM D-1**Longitude:** 165.2204**Location description and accuracy:**

This tactite is on the west side of Grand Central River and north of Thompson Creek. A very general location was shown by Hummel (1961). This is locality 14 of Cobb (1972 [MF 463]; 1978 [OFR 78-93]); Cobb (1975 [MR-66]) also included this occurrence in his summary of Alaska tungsten deposits. The location is approximate but probably within about one half mile of the coordinates.

Commodities:**Main:** W**Other:****Ore minerals:** Scheelite**Gangue minerals:** Calc-silicate minerals**Geologic description:**

This tactite occurrence is in upper amphibolite facies metasedimentary rocks near the north contact of the Thompson Creek orthogneiss (Hummel, 1962 [MF 248]; Till, 1980). This is one of four similar occurrences (this occurrence, NM027, NM041, and NM044) identified by Hummel (1961) in the central and southern Kigluaik Mountains. The calc-silicate (tactite) assemblages are interpreted to have been metamorphosed along with their country rocks. Scheelite is present in all four occurrences and galena and sphalerite accompany scheelite in one (NM044). Stream sediments in Thompson Creek contained as much as 150 ppm copper, 600 ppm zinc, 12 ppm molybdenum, and 50 ppm bismuth (Hummel and Chapman, 1960). Heavy mineral concentrates from Thompson Creek (NM036) contained scheelite (Hummel, 1962).

The Thompson Creek orthogneiss has been determined to have a latest Proterozoic protolith (555 Ma, Amato and Wright, 1998). The upper amphibolite facies rocks, primarily north of the Thompson Creek orthogneiss, are probably derived from Precambrian protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick

and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Recrystallized calc-silicate rocks.

Age of mineralization:

Late Proterozoic (?); may be the same age as the Thompson Creek orthogneiss.

Deposit model:

W skarn deposit (Cox and Singer, 1986; model 14a).

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

14a

Production Status:

Site Status: Probably inactive

Workings/exploration:

No workings are known at this locality.

Production notes:**Reserves:****Additional comments:****References:**

Hummel and Chapman, 1960; Hummel, 1961; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Sainsbury, 1972; Cobb, 1975 (MR-66); Cobb, 1978 (OFR 78-93); Bunker and others, 1979; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Thompson Creek**Site type:** Occurrence**ARDF no.:** NM036**Latitude:** 64.9472**Quadrangle:** NM D-1**Longitude:** 165.2109**Location description and accuracy:**

Thompson Creek is a west tributary to Grand Central River. The mouth of Thompson Creek is 5.5 miles southeast of Mount Osborn. This is locality 82 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** W**Other:****Ore minerals:** Scheelite**Gangue minerals:****Geologic description:**

Hummel (1961) reported scheelite in heavy mineral concentrate from Thompson Creek. Stream sediments from this creek contained as much as 150 ppm copper, 600 ppm zinc, 12 ppm molybdenum, and 50 ppm bismuth (Hummel and Chapman, 1960). Both the north and south contacts of the Thompson Creek orthogneiss (Hummel, 1962 [MF 242]; Till, 1980) are in this drainage, and a tactite occurrence with scheelite (NM035) is just to the north of this drainage.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Placer scheelite occurrence.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None

Site Status: Inactive

Workings/exploration:

Surface sampling of sediments is all that has taken place here.

Production notes:

Reserves:

Additional comments:

References:

Hummel and Chapman, 1960; Hummel, 1961; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till, 1980.

Primary reference: Hummel, 1961

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Grand Central River)**Site type:** Occurrence**ARDF no.:** NM037**Latitude:** 64.9346**Quadrangle:** NM D-1**Longitude:** 165.2076**Location description and accuracy:**

This pegmatite is on an east-facing slope along the west side of the Grand Central River valley between Thompson and Tunit Creeks. It is at an elevation of about 2,000 feet and 0.8 mile southwest of the mouth of Thompson Creek (NM036).

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997;

Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Tunit Creek)**Site type:** Occurrence**ARDF no.:** NM038**Latitude:** 64.9262**Quadrangle:** NM D-1**Longitude:** 165.2346**Location description and accuracy:**

The occurrence includes at least two pegmatites that crop out on a ridge between elevations of about 2,700 and 3,000 feet. The ridge is at the common head of Tunit, Nugget, and Deep Canyon Creeks. It is locality 87 of Hummel (1975).

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

These pegmatites are south of the Thompson Creek orthogneiss, and their age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near these occurrences. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997; 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and

others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Hummel, 1975; Hawley and Associates, 1978; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and

Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Tigaraha Mountain)**Site type:** Occurrence**ARDF no.:** NM039**Latitude:** 64.9198**Quadrangle:** NM D-1**Longitude:** 165.3146**Location description and accuracy:**

Several pegmatites crop out on a sharp ridge southwest of Tigaraha Mountain at elevations of about 2,800 to 3,000 feet. The pegmatite occurrences are localities 76, 77, and 78 of Hummel (1975). The location given is the approximate center of the pegmatite cluster on the ridge.

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

These pegmatites are south of the Thompson Creek orthogneiss, and their age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near these occurrences. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that

are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hummel, 1975; Hawley and Associates, 1978; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995;

Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Deep Canyon Creek)

Site type: Occurrence

ARDF no.: NM040

Latitude: 64.9031

Quadrangle: NM D-1

Longitude: 165.2925

Location description and accuracy:

This occurrence is on the ridge crest between Buffalo and Deep Canyon Creeks about 0.6 mile north of hill 2185. It is on the south side of the saddle between the two drainages at an elevation of about 2,100 feet. It is locality 75 of Hummel (1975).

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to this pegmatite are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and oth-

ers, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hummel, 1975; Hawley and Associates, 1978; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near North Star Creek)**Site type:** Occurrence**ARDF no.:** NM041**Latitude:** 64.9150**Quadrangle:** NM D-1**Longitude:** 165.3728**Location description and accuracy:**

This tactite is on a sharp ridge between North Star Creek and upper Sinuk River. It is in the NW1/ NW1/4 section 6, T. 7 S., R. 33 W. , Kateel River Meridian. This is locality 13 of Cobb (1972 [MF 463], 1978 [OFR 78-93]), locality 40 of Hummel (1962 [MF 248]), and locality 79 of Hummel (1975). The location is accurate within about 1,000 feet of the coordinates.

Commodities:**Main:** W**Other:****Ore minerals:** Scheelite**Gangue minerals:** Calc-silicate minerals**Geologic description:**

This is one of four tactite occurrences (this occurrence, NM027, NM035, and NM044) identified by Hummel (1961) in the central and southern Kigluaik Mountains. The calc-silicate assemblages that are the hosts of the tactite are interpreted to have been metamorphosed along with their country rocks by Hummel. Scheelite is present in all four occurrences, and galena and sphalerite accompany scheelite in one (NM044).

This occurrence is in amphibolite facies metasedimentary rocks along the south contact of the Thompson Creek orthogneiss (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been determined to have a Late Proterozoic protolith (555 Ma, Amato and Wright, 1998). The metasedimentary rocks south of the Thompson Creek orthogneiss are considered to have Precambrian or early Paleozoic protoliths (Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Lei-

berman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Recrystallized calc-silicate assemblages.

Age of mineralization:

Late Proterozoic (?); may be the same age as the Thompson Creek orthogneiss.

Deposit model:

W skarn deposit (Cox and Singer, 1986; model 14a).

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

14a

Production Status:

Site Status: Probably inactive

Workings/exploration:

No workings are known at this locality.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1961; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (between North Star Creek and Windy Creeks)

Site type: Occurrence

ARDF no.: NM042

Latitude: 64.9074

Quadrangle: NM D-1

Longitude: 165.4120

Location description and accuracy:

The occurrence includes at least two pegmatites that crop out on the sharp ridge crest between North Star and Windy Creeks. The location is approximately located at an approximate elevation of 1,900 feet. This is locality 82 of Hummel (1975).

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

These pegmatites are south of the Thompson Creek orthogneiss, and their age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near these occurrences. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998) and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and

others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hummel, 1975; Hawley and Associates, 1978; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near North Star Creek)

Site type: Occurrence

ARDF no.: NM043

Latitude: 64.8995

Quadrangle: NM D-1

Longitude: 165.4053

Location description and accuracy:

The occurrence is on North Star Creek, probably on the west side at an elevation of about 1,300 feet. It is locality 39 of Hummel (1962 [MF 248]) and locality 81 of Hummel (1975). The location is probably accurate within about 1,000 feet of the coordinates.

Commodities:

Main:

Other:

Ore minerals: Arsenopyrite, pyrite, pyrrhotite (?)

Gangue minerals:

Geologic description:

Hummel (1962 [MF 248]) identified this as an iron sulfide occurrence, including arsenopyrite with pyrite and possibly pyrrhotite. The host rock is amphibolite facies metasedimentary bedrock. No other information is available.

Alteration:

Age of mineralization:

Deposit model:

Iron sulfides in amphibolite facies metasedimentary rocks.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Prospect pit.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Windy Creek)**Site type:** Occurrence**ARDF no.:** NM044**Latitude:** 64.9070**Quadrangle:** NM D-1**Longitude:** 165.4644**Location description and accuracy:**

The occurrence is at an elevation of about 1,600 feet in a steep-walled, east-trending canyon. The canyon enters Windy Creek about 2 miles above the confluence of Windy Creek and Sinuk River. This is locality 37 of Hummel (1962 [MF 248]), locality 83 of Hummel (1975), and locality 12 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** W**Other:****Ore minerals:** Scheelite**Gangue minerals:** Calc-silicate minerals**Geologic description:**

This is one of four tactite scheelite occurrences (this occurrence, NM027, NM035, and NM041) identified by Hummel (1961) in the central and southern Kigluaik Mountains. The calc-silicate assemblages hosts to the tactite were interpreted by Hummel to have been metamorphosed along with their country rocks. Scheelite is present in all four occurrences, and galena and sphalerite accompany scheelite here.

This occurrence is in amphibolite facies metasedimentary rocks along the south contact of the Thompson Creek orthogneiss (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been determined to have a Late Proterozoic protolith (555 Ma, Amato and Wright, 1998). The metasedimentary rocks south of the Thompson Creek orthogneiss are considered to have Precambrian or early Paleozoic protoliths (Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others,

1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Recrystallized calc-silicate assemblages.

Age of mineralization:

Late Proterozoic (?); may be the same age as the Thompson Creek orthogneiss.

Deposit model:

W skarn deposit (Cox and Singer, 1986; model 14a).

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

14a

Production Status:

Site Status: Probably inactive

Workings/exploration:

Mining claims were staked along the south contact of the Thompson Creek orthogneiss from this locality east across Windy Creek (Alaska Division of Geological and Geophysical Surveys, 1982); at least some surface exploration has probably occurred here.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1961; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (on hill 2321)**Site type:** Occurrence**ARDF no.:** NM045**Latitude:** 64.9021**Quadrangle:** NM D-1**Longitude:** 165.4990**Location description and accuracy:**

The occurrence is a composite of several pegmatites mapped by Hummel (1975, localities 85 and 86) on hill 2321, about 2 miles south-southwest of Mosquito Pass. These occurrences are almost at the west boundary of the Nome D-1 quadrangle. They are at an elevation of about 2,300 feet and about 1 mile west-southwest of the tactite occurrence at NM044. Mining claims were staked from this locality across the unnamed creek to the west (Alaska Division of Geological and Geophysical Surveys, 1982).

Commodities:**Main:** Be, Th, U**Other:****Ore minerals:** Beryl, unknown thorium- and uranium-bearing minerals**Gangue minerals:** Feldspar, garnet, quartz, tourmaline**Geologic description:**

These pegmatites are south of the Thompson Creek orthogneiss, and their age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near these occurrences. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the more radioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek (NM046).

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994;

Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Age of mineralization:

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hummel, 1975; Hawley and Associates, 1978; Till, 1980; Alaska Division of Geological and Geophysical Surveys, 1982; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman,

1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near hill 1807)

Site type: Occurrence

ARDF no.: NM046

Latitude: 64.9016

Quadrangle: NM D-1

Longitude: 165.4659

Location description and accuracy:

This pegmatite occurrence is on hill 1807 overlooking the west side of lower Windy Creek.

Commodities:

Main: Be, Th, U

Other:

Ore minerals: Beryl, unknown thorium- and uranium-bearing minerals

Gangue minerals: Feldspar, garnet, quartz, tourmaline

Geologic description:

This pegmatite is south of the Thompson Creek orthogneiss, and its age is uncertain. Granite pegmatites are abundant in the Kigluaik Mountains, and others may be present near this occurrence. The pegmatites are noticeably radioactive; radioactivity measured on the ground with a scintillometer is as much as 500 counts per second or 3 to 5 times common background (Hawley and Associates, 1978, Section IV). Tourmaline and garnet are common accessory minerals, and the moreradioactive pegmatites commonly contain smoky quartz. Beryl occurs in some of the pegmatite, including a body described by Moffit (1913, p. 25) about 1 mile west of the mouth of North Star Creek that may be this occurrence.

Some granite pegmatites are within the Thompson Creek orthogneiss or appear to be spatially associated with it, particularly on its south or hanging wall side (Hummel, 1962 [MF 248]; Till, 1980). The Thompson Creek orthogneiss has been dated as latest Proterozoic (555 Ma, Amato and Wright, 1998), and some pegmatites may also be this age. However, metasedimentary rocks of the Kigluaik Mountains underwent granulite facies metamorphism and partial melting in the mid-Cretaceous, and some pegmatites are cross-cutting to local structure and are mid-Cretaceous in age (Throckmorton and Hummel, 1979; Till, 1983; Miller and Hudson, 1991; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

The host rocks to these pegmatites are amphibolite facies metasedimentary rocks that are derived from Precambrian or early Paleozoic protoliths (Sainsbury, 1972; Bunker and

others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:**Age of mineralization:**

Late Proterozoic or mid-Cretaceous; either the age of the Late Proterozoic Thompson Creek orthogneiss or mid-Cretaceous amphibolite facies metamorphism.

Deposit model:

Simple granite pegmatite with rudimentary zoning.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance uranium exploration including airborne radiometrics, stream sediment surveys, and ground traverses have been completed in the Kigluaik Mountains.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hawley and Associates, 1978; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hawley and Associates, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Charlie Creek (placer)

Site type: Mine

ARDF no.: NM047

Latitude: 64.8580

Quadrangle: NM D-1

Longitude: 165.4897

Location description and accuracy:

Charlie Creek is a south tributary to upper Sinuk River. Placer gold was mined in lower Charlie Creek from below the forks of upper Charlie Creek downstream to where it enters the flood plain of Sinuk River (Collier and others, 1908, plate X). This is locality 80 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Bi, Ti

Ore minerals: Arsenopyrite (?), bismuth, bismuthinite, gold, rutile

Gangue minerals:

Geologic description:

Placer gold was mined on Charlie (Charley) Creek on a small scale prior to WWI (Brooks and others, 1901). Moffit (1907) reports that discovery of bismuth minerals in miners' sluice boxes led to the discovery of the bismuth-bearing quartz veins (NM048) in upper Charlie Creek (Moffit, 1907). Hummel and Chapman (1960, p. B32) reported 20 ppm bismuth from a stream sediment sample from Charlie Creek, the highest content of any creek that they sampled in the southwest Seward Peninsula except for Thomson Creek (NM036) in the Kigluaik Mountains. They also reported 300 ppm arsenic, a concentration only equaled at Rock Creek in the Nome C-1 quadrangle, suggesting the presence of arsenopyrite in the creek sediments.

Charlie Creek drains pelitic biotite-garnet schist and a highly pyritic pelitic schist (Bundzten and others, 1994). These metasedimentary rocks are probably of Precambrian or early Paleozoic protolith age (Till and Dumoulin, 1994; Bundzten and others, 1994). The schist is cut by numerous quartz veinlets in cross-joints there are a few quartz veins reportedly to be as much as 4 feet wide (Chapin, 1914 [B 592-L, p. 385-395]). The quartz veins or veinlets are probably the source of the gold, native bismuth, bismuthinite and rutile that has been reported from heavy mineral concentrates from Charlie Creek.

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: Undetermined

Site Status: Probably inactive

Workings/exploration:

Charlie Creek was known as auriferous by 1901 (Brooks and others, 1901). The creek was mined on a small scale with sluice boxes before 1907 (Moffit, 1907). It probably has been prospected more recently.

Production notes:**Reserves:****Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Chapin, 1914 (B 592-L); Hummel and Chapman, 1960; Bundtzen and others, 1994; Till and Dumoulin, 1994.

Primary reference: Moffit, 1907

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Charlie Creek (lode)**Site type:** Prospect**ARDF no.:** NM048**Latitude:** 64.8458**Quadrangle:** NM D-1**Longitude:** 165.4764**Location description and accuracy:**

The prospect is on the east fork of Charlie Creek, a north-flowing tributary of upper Sinuk River. The prospect is at an elevation of about 1,000 feet and is located within about 1,000 feet. It is locality 4 of Hummel (1962 [MF 248]) and locality 11 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Bi**Other:** Au**Ore minerals:** Bismuth, bismuthinite, gold, pyrite**Gangue minerals:** Graphite, quartz, sericite (white mica)**Geologic description:**

Two bismuth-bearing quartz veins were found prior to 1907 by tracing native bismuth nuggets found during early placer gold mining on Charlie Creek to their source (Moffit, 1907). These veins are exposed in cuts on both sides of Charlie Creek. As described by Cathcart (1922, p. 223-224), one vein was 5 inches and the other 10 inches wide. They were separated by about 1 foot of schist. The veins strike N 80 W and dip 50 degrees N. The veins were predominantly vuggy quartz with some white mica, native bismuth, and bismuthinite. Chapin (1914 [B 592-L, p. 397-407]) reported a 4-foot-wide quartz vein with gold-bearing intergrown bismuth and bismuthinite. When the property was visited by Cathcart (1922), there was only about 1 or 2 percent of bismuth minerals in dump material. Some richer material may have been hand-picked and produced earlier. Although platinum had been reported, the U.S. Geological Survey did not find any by assay (Cathcart, 1922). Platinum was again reported in the 1950's but its presence has not been reliably confirmed. The prospect must have been active periodically, because there were buildings and some fairly modern equipment at the site when one of the compilers (C. C. Hawley) visited the property in about 1995. The veins and widely spaced veinlets in joints are presumably the source of gold, bismuth, and rutile reported in the Charlie Creek placer below the lode (NM047).

The country rock of the Charlie Creek prospect is lower amphibolite facies pelitic schist

containing garnet and biotite (Bundzten and others, 1994). The schist strikes east-northeast to east and dips south. North-dipping joints are common and contain thin quartz veinlets at a 1-foot or greater spacing. The country rock could be the older part of the Nome Group and have a Precambrian protolith (Bundzten and others, 1994; Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:**Age of mineralization:**

Probably mid-Cretaceous, the same age as some gold-quartz veins of southern Seward Peninsula.

Deposit model:

Low-sulfide Au 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: Probably inactive

Workings/exploration:

The prospect was found prior to 1907 by tracing bismuth or bismuthinite nuggets found in sluice boxes in lower Charlie Creek upstream to their source (Moffit, 1907). In 1914, Chapin reported that prospectors had found a 4-foot vein which contained bismuth and gold. Cathcart (1922) reported open cuts on both sides of upper Charlie Creek; evidence of later workings and support facilities were found in 1995.

Production notes:

Possibly some hand-picked bismuth ore was shipped from this prospect.

Reserves:**Additional comments:**

References:

Moffit, 1907; Chapin, 1914 (B 592-L); Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Bundtzen and others, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Boer Creek**Site type:** Mine**ARDF no.:** NM049**Latitude:** 64.8644**Quadrangle:** NM D-1**Longitude:** 165.2988**Location description and accuracy:**

Boer Creek is a south tributary of the Hudson River, a headwater tributary of Nome River. The mine is about 1.25 miles west-southwest of where Dickens Creek crosses the Nome-Taylor road. The mine is in Boer Creek at an approximate elevation of 850 feet. The location is accurate within about 1,000 feet. Boer Creek is locality 81 of Cobb (1972 [MF 468], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining took place on Boer Creek in 1901-02 when about 135 ounces of gold were produced (Collier and others, 1908). The recovered gold was of two types: one valued at about 16 dollars per ounce and one valued at 18 dollars per ounce (gold at 20.67dollars per ounce). The paystreak was narrow and nearly confined to the creek bed; gravel in the creek was from 18 inches to 8 feet thick. The upper part of the creek contained a iron-cemented ferricrete gravel which also contained placer gold. When the placer was visited by Moffit in 1905-06, it was producing gold from a small hydraulic plant operated on a residual placer on weathered graphitic schist, which Moffit believed furnished all or most of the placer gold (Moffit, 1913, p. 76, 100).

Boer Creek is underlain by the graphitic, calcareous schist unit of Hummel (1962 [MF 248]) that consists predominantly of slightly graphitic, calcareous quartz schist. Regional mapping suggests that these schists have been upgraded to lower amphibolite facies and are biotite-bearing (Sainsbury, Hummel, and Hudson, 1972; Bundzten and others, 1994). According to Collier and others (1908, p. 182), the bedrock at the mine was a chloritic schist cut by numerous glassy quartz veins. The bedrock could be part of the Nome Group derived from Precambrian to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic

or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

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:

The deposit was mined on a small scale in 1901 and 1902 when it produced about 135 ounces of gold of 770 and 870 fineness. It was shut down in 1903 pending the completion of the Champion Ditch, but it was again operated as a small hydraulic mine in 1906. It has been inactive for many years.

Production notes:

About 135 ounces of gold of 770 and 870 fineness were produced in 1901-02 (Collier and others, 1908).

Reserves:**Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Bundtzen and others, 1994; Amato and others, 1994; Dumitru and others, 1995;

Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (hill 1690)

Site type: Occurrence

ARDF no.: NM050

Latitude: 64.8782

Quadrangle: NM D-1

Longitude: 165.2166

Location description and accuracy:

This occurrence is on the north-facing slope of hill 1690 (locally called Copper Mountain) at an elevation of 1,150 feet. It is 0.8 mile south of the Nome-Taylor road near the divide between the Nome River and Salmon Lake drainages. It is locality 26 of Hummel (1962 [MF 248]).

Commodities:

Main: W

Other:

Ore minerals: Scheelite

Gangue minerals:

Geologic description:

Hummel (1962 [MF 248]) noted that scheelite is present at this locality. The scheelite could be in veins crosscutting the metamorphic host rocks or in older pre-metamorphic tactite deposits (see NM027, NM035, NM041, and NM044). Bedrock in the area is primarily calc-schist with some chloritic and mafic schist, marble, and small orthogneiss bodies (Thurston, 1985, figure 3A). An orthogneiss body 4.5 miles to the northeast has been determined to have a 678 Ma protolith age (Amato and Wright, 1998). The metamorphic rocks are part of the Nome Group and derived from Precambrian to early Paleozoic protoliths (Till and Dumoulin, 1994).

The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization (and related quartz-scheelite veining) on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and

Snee, 1996; Goldfarb and others, 1997). A late Proterozoic age, however, is possible for scheelite tactite deposits affiliated with orthogneiss.

Alteration:

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Scheelite in veins or disseminated in metamorphic rocks.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Some small prospecting pits may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF-248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Copper King**Site type:** Prospect**ARDF no.:** NM051**Latitude:** 64.8802**Quadrangle:** NM D-1**Longitude:** 165.2131**Location description and accuracy:**

The Copper King prospect is on the northwest flank of hill 1610, which lies between Copper Creek and Dickens Creek. The prospect is at an elevation of about 1,100 feet, 0.75 mile south of the Nome-Taylor road near the divide between the Nome River and Salmon Lake drainages. The prospect is located within about 500 feet. It is locality 6 of Hummel (1962 [MF 248]) and included with other nearby prospects in locality 16 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu, Pb**Other:** Ag, Au**Ore minerals:** Azurite, bornite, chalcopyrite, galena, malachite, pyrite**Gangue minerals:** Mica, quartz**Geologic description:**

Hummel (1962 [MF 248]) noted the presence of copper and lead minerals here. On the basis of descriptions of copper mineralization in the general area (Smith, 1908; Cathcart, 1922), the mineralization is likely to include azurite, malachite, bornite, chalcopyrite, pyrite, and possibly galena in silica-rich rocks near a marble-schist contact. Early workers noted that the mineralization was stratabound but interpreted it to be in silicified zones and to have a replacement origin.

Picked samples (probably from the Copper Mountain prospect, NM054, 0.6 mile to the south) contained 15 percent copper, 20 percent lead, and 'rather high silver and low gold content' (Smith, 1908, p. 240-242). This prospect appears to have similarities to several other copper-bearing deposits in the eastern Teller quadrangle (for example, the Ward mine, Hudson, 1998, TE071) and in the western Solomon quadrangle (for example, the Wheeler mine, Hudson, 1999, SO172).

The Copper King prospect occurs in graphitic calc-mica schist with interlayered marble; the schist includes concordant bodies of granitic orthogneiss; one of the orthogneiss bodies occurs below the Copper King prospect (Hummel, 1962, MF-248; Thurston, 1985, figure 3A). Cathcart (1922, p. 219) described the orthogneiss as mainly fine grained, but

with local porphyritic facies. An orthogneiss body 4.5 miles to the northeast has been determined to have a 678 Ma protolith age (Amato and Wright, 1998).

The metamorphic rocks are part of the Nome Group and derived from Precambrian to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997). The age of nearly stratabound copper occurrences is more enigmatic, with a range of ages from that of the protolith through the late Proterozoic emplacement of some orthogneiss to the mid-Cretaceous.

Alteration:

Bleaching, development of silica-rich rock, introduction of white mica, and oxidation.

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

There is a short adit and shallow shaft on the property. The earliest workings were before 1908 (Smith, 1908). There has been little recent work.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth,

1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998; Hudson, 1998; Hudson, 1999.

Primary reference: Smith, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nugget Creek

Site type: Occurrence

ARDF no.: NM052

Latitude: 64.8874

Quadrangle: NM D-1

Longitude: 165.1957

Location description and accuracy:

Nugget Creek is an east tributary to lower Grand Central River. This occurrence is 1 mile east of the divide between Nugget Creek and the headwaters of Nome River and 0.25 mile south of the Nome-Taylor road. It is locality 70 of Hummel (1975).

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals: Carbonate, quartz

Geologic description:

Hummel (1975) identified this occurrence as stratabound with mineralized and silicified marble; additional information was not provided. This occurrence is about 1 mile or less to the north of several prospects where stratabound, copper-bearing, silica-rich rocks are developed in marble. These prospects include NM051, NM053, and NM054.

Alteration:

Silica-rich rocks in marble; silicification?

Age of mineralization:

Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Stratabound, mineralized, silica-rich rock in marble.

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:

Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Copper Creek**Site type:** Prospect**ARDF no.:** NM053**Latitude:** 64.8807**Quadrangle:** NM D-1**Longitude:** 165.1767**Location description and accuracy:**

The Copper Creek occurrence is in the valley of Copper Creek about 0.6 mile above the confluence of Copper Creek and Nugget Creek. Nugget Creek is a east tributary to lower Grand Central River. Copper Creek heads on hill 2160. The occurrence is at an elevation of about 800 feet. It is locality 5 of Hummel (1962 [MF 248]) and locality 17 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu**Other:****Ore minerals:** Azurite, bornite, malachite**Gangue minerals:** Calcite, quartz**Geologic description:**

An incline was driven on mineralized marble on the east side of Copper Creek; it showed roughly stratabound bornite and copper carbonate minerals in bleached marble with silica-rich zones (Cathcart, 1922). Nearby schist is cut by sulfide-bearing quartz-calcite veins. Country rock at the Copper Creek occurrence is dominantly graphitic and calcareous schist with some marble layers. Locally, marble has been bleached from a characteristic blue-gray color to white. One zone about 12 feet thick has been bleached; in other places altered white marble alternates with less altered bluish marble to form a banded unit (Cathcart, 1922, p. 219-220). The rocks mainly strike northeast and dip southeast (Hummel, 1962 [MF 248]). Near the prospect, marble layers as much as 100 feet thick are interlayered with schist. This prospect appears to have similarities to several other copper-bearing deposits in the eastern Teller quadrangle (for example, the Ward mine, Hudson, 1998, TE071) and in the western Solomon quadrangle (for example, the Wheeler mine, Hudson, 1999, SO172).

The metamorphic rocks here are part of the Nome Group derived from Precambrian to early Paleozoic protoliths (Thurston, 1985; Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston,

1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997). The origin of the nearly stratabound copper deposits is enigmatic. They could have formed in the Proterozoic, Paleozoic or, as replacement deposits, in the Mesozoic.

Alteration:

Marble is bleached and contains bornite and secondary copper carbonate minerals in silica-rich zones, and oxidation.

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock.

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Early prospecting occurred here before 1913 (Moffit, 1913); an adit had been driven about 25 feet and abandoned. Cathcart (1922) reported a shallow shaft and incline were opened on the west side of the creek; about 200 feet to the east, the zone was explored with an incline. When visited by Cathcart, the incline was filled with ice at a depth of about 20 feet.

Production notes:**Reserves:****Additional comments:****References:**

Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others,

1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998; Hudson, 1998; Hudson, 1999.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Copper Mountain**Site type:** Prospect**ARDF no.:** NM054**Latitude:** 64.8719**Quadrangle:** NM D-1**Longitude:** 165.2089**Location description and accuracy:**

The occurrence is on the south side of hill 1690, on the divide between Copper Creek and Dickens Creek. This hill was called Copper Mountain by Cathcart (1922, figure 15). It is locality 7 of Hummel (1962 [MF 242]) and was included with other nearby prospects in locality 16 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu, Pb**Other:** Ag, Au**Ore minerals:** Azurite, bornite, chalcopyrite, galena, malachite, pyrite**Gangue minerals:** Calcite, mica, quartz**Geologic description:**

The Copper Mountain prospect appears to be the most significant of the several copper prospects in this area (NM051, NM053, this prospect, NM055, NM056, and NM115). As reported by Smith (1908), blocks of marble are malachite stained, and hand-picked material contained 15 percent copper, 20 percent lead, rather high silver, and low gold. Bornite, galena, chalcopyrite, and copper carbonates were present in shallow workings that included a 10 foot shaft and an incline. The workings were caved or flooded in 1920 (Cathcart, 1922). Cathcart (1922) describes the mineralization here as sulfide-bearing, silica-rich layers in bleached marble. Some small quartz veinlets and muscovite are parallel to layers in the host metacarbonate rock. This prospect appears to have similarities to several other copper-bearing deposits in the eastern Teller quadrangle (for example, the Ward mine, Hudson, 1998, TE071) and in the western Solomon quadrangle (for example, the Wheeler mine, Hudson, 1999, SO172).

The country rocks here are interlayered pelitic schist and marble that is part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Thurston, 1985, figure 3A; Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to

greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 (thesis); Ford and Snee, 1996; Goldfarb and others, 1997). The relation of the Copper Mountain deposit to the lode gold deposits is uncertain. A mid-Cretaceous age for the stratabound copper deposits is possible, but Copper Mountain could have also formed in late Proterozoic synchronous with emplacement of some orthogneiss or in the early Paleozoic in relation to other plutonism.

Alteration:

Development of silica-rich layers, formation of white mica, bleaching of marble, and oxidation.

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Explored by pits, trenches, a shallow shaft, and an incline; these were caved or water-filled by 1920.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998; Hudson, 1998;

Hudson, 1999.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (head of Jett Creek)**Site type:** Occurrence**ARDF no.:** NM055**Latitude:** 64.8503**Quadrangle:** NM D-1**Longitude:** 165.1451**Location description and accuracy:**

This occurrence is on the ridge crest between the headwaters of David and Jett Creeks at an elevation of 2,250 feet. This is locality 25 of Hummel (1962 [MF 248]) and locality 18 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu**Other:****Ore minerals:****Gangue minerals:****Geologic description:**

Hummel (1962 [MF 248]) noted this locality as an occurrence of copper-bearing minerals. It may be similar to other copper prospects in the area, such as Copper Mountain (NM054), Copper King (NM051), and Copper Creek (NM053). These are copper carbonate and copper sulfide-bearing silica-rich zones in metacarbonate rocks.

Country rocks at this locality are interlayered pelitic schist and marble structurally overlain a short distance to the south by chloritic and mafic schist (Thurston, 1985, figure 3A). These metamorphic rocks are part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997). The relation of this occurrence to the lode gold deposits is uncertain. A mid-Cretaceous age for the nearly

stratabound copper deposits is possible. The deposits could, however, have formed in the late Proterozoic or in the early Paleozoic, synchronous with known periods of early plutonism on the Seward Peninsula.

Alteration:

Development of silica-rich layers, formation of white mica, bleaching of marble (?), and oxidation.

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Small prospecting pits may be present.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): David Creek**Site type:** Occurrence**ARDF no.:** NM056**Latitude:** 64.8453**Quadrangle:** NM D-1**Longitude:** 165.1587**Location description and accuracy:**

David Creek is an east tributary to upper Nome River. This occurrence is in the headwaters of David Creek at an elevation of 1,650 feet; it is locality 60 of Hummel (1975).

Commodities:**Main:** Cu (?)**Other:****Ore minerals:** Azurite (?), chalcopyrite (?), malachite (?), pyrite (?)**Gangue minerals:** Carbonate, quartz**Geologic description:**

Hummel (1975) identified this occurrence as stratabound, sulfidized, silicified marble; additional information was not provided. Other stratabound mineralization in the area consists of copper-bearing, silica-rich rock in marble as at NM051, NM053, NM054, and NM055.

Alteration:

Development of silica-rich rocks in marble, silicification?

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock.

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:

Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Divide Creek**Site type:** Prospect**ARDF no.:** NM057**Latitude:** 64.8374**Quadrangle:** NM D-1**Longitude:** 165.2717**Location description and accuracy:**

Divide Creek is a short, west tributary to upper Nome River. Its headwaters are at the divide between the Nome River and Stewart River drainages. Divide Creek enters Nome River about 2 miles south of the confluence of Hudson Creek and Nome River. This location is just downslope of where the Campion Ditch crosses Divide Creek. It is locality 104 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

Divide Creek is a small creek that heads in the divide between the Stewart River and Nome River drainages. Some sluicing of placer gold took place here in 1903 (Collier and others, 1908). Parts of the creek flow over deep gravel deposits of glacial origin (Collier and others, 1908). Nearby glacial and fluvio-glacial deposits are part of the modified drift of the Nome River glaciation and the modified drift of the Stewart River glaciation (Bundtzen and others, 1994). During construction of the Campion Ditch, quartz with attached gold was found near here; one quartz fragment with gold weighed 0.75 pound (Moffit, 1913).

Moffit (1913) thought the placer gold was derived from near Boer Mountain; recent hardrock exploration has found significant lode gold deposits nearby, for example at the Divide prospect (NM058). Some of the gold at Divide Creek could also been derived by reworking of weakly auriferous glacial drift of the Nome River and Stewart River glaciations.

Bedrock is not exposed in Divide Creek, but nearby it appears to be graphitic and calcareous quartz schist (Hummel, 1962 [MF 248]). This schist may be lower grade than most of the metamorphic rocks immediately to the north on Boer Mountain. (Projections from mapping to the west suggest that the western rocks could be biotite-bearing

[Sainsbury, Hummel, and Hudson, 1972; Bundzten and others, 1994]).

The bedrock is probably part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). The ultimate source of the placer deposits at Divide Creek are lode gold deposits related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 (thesis); Ford and Snee, 1996; Goldfarb and others, 1997).

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: Probably inactive

Workings/exploration:

Collier and others (1908) noted some mining in 1903 and plans, probably not carried out, for hydraulic mining. Moffit (1913, p. 100) found no evidence of extensive mining when he visited the area, but did note that the placer gold could have come from the south slopes of Boer Mountain.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and

others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Divide**Site type:** Prospect**ARDF no.:** NM058**Latitude:** 64.8451**Quadrangle:** NM D-1**Longitude:** 165.2954**Location description and accuracy:**

The Divide prospect is due south of Boer Creek (NM049). It is approximately bounded on the west by Quartz Creek (NM111); it is north of Divide Creek (NM057) and west of the Champion Ditch. The prospect area extends north nearly 1 mile long and is more than one-half mile wide. The location given is the approximate center of this large mineralized area that extends across a low hill (locally called Boer Mountain) that is about 1,425 feet high.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, galena, gold, jamesonite, pyrite, pyrrhotite, sphalerite, stibnite**Gangue minerals:** Albite, ankerite, quartz**Geologic description:**

The most extensive work on the Divide prospect dates from the 1990s (Chris Gierym-ski, Cominco American, written communication, December 1995). In 1994, David and Daniel Lajack established a 2,000- by 2,500-foot soil-sample grid on the southeast flank of Boer Mountain, the hill at the head of Boer Creek (NM047). Seventeen of 57 soil samples contained 100 ppb or more of gold; the highest content was 370 ppb gold. In 1995, Cominco expanded the grid to a 1- by 1.5-mile area elongated to the north, collected almost 700 soil samples, and ran VLF and ground magnetics. A series of 21 trenches was also dug at this time, with a total length of 5,822 feet. About 1,000 samples were collected from the trench system.

At least two major northeast-trending vein zones were found as a result of Cominco's exploration effort. Trench 1 trends east; it starts about 1,300 feet east of Quartz Creek approximately on the section line between sections 26 and 35 on the southeast flank of Boer Mountain. One- to 3-foot-wide gold-bearing quartz veins that strike northeast and dip nearly vertically were mapped and sampled near trench 1. The channel samples along a 50-foot interval in trench 1 assayed 0.663 ounce of gold per ton. The trench was partly frozen; strong 'muck' anomalies were found along the trench in three sections that aggre-

gated 250 feet in length. Trench D-12 cut approximately the same zone as trench 1, and it was also well mineralized. Trenches D-10 and D-11 were cut nearly on the divide between Quartz Creek and Boer Creek; these trenches also found quartz veins that strike northeast and dip steeply to shallowly. Trench 10 found a maximum of 8 feet of 0.047 ounces of gold per ton; trench D-11 contained 55 feet of 0.437 ounce of gold per ton and 40 feet of 0.044 ounce of gold per ton, including an interval of 20 feet that contained 0.080 ounce of gold per ton. Trench D-9, north of trenches 10 and 11 and on trend with upper Boer Creek, had a 70-foot interval with 0.024 ounce of gold per ton, including 20 feet with 0.067 ounces of gold per ton.

The prospect was drilled by Cominco American in 1996 (written communication, August 22, 1996). In general, drill results were not as good as trench results. Five holes were drilled at the head of the divide between Quartz Creek and Boer Creek. The best drill hole, D-6, intercepted 28 feet that contained 0.011 ounce of gold per ton. Three holes were drilled southeast of Boer Mountain; hole Div-9 contained 10 feet with 0.235 ounce of gold per ton. About 2,000 feet east of Boer Mountain, hole Div-3 had 37 feet with 0.055 ounce of gold per ton, including 24.7 feet with 0.091 ounce of gold per ton.

The gold-bearing quartz veins occur along joints and fractures. The veins have albite and local silicified selvages, and larger veins have several feet of selvage with iron-bearing carbonate (ankerite). In general, pyritization appears to be a favorable indication of nearby gold mineralization. In decreasing order of abundance, the ore minerals in the veins are pyrite, arsenopyrite, pyrrhotite, galena, stibnite, sphalerite, and jamesonite.

The host rocks at the Divide prospect are metasedimentary rocks of retrograde greenschist or lower amphibolite facies, including graphitic and calcareous schist, blue-gray, gray, and black marble, and black quartz schist and quartzite (Hummel, 1962 [MF 248]). Strata west and northwest of Quartz Gulch, including most of the canyon of Boer Creek, are less graphitic. Projection of bedrock geology from the west suggests that some of these metamorphic rocks could be biotite-bearing (Sainsbury, Hummel, and Hudson, 1972; Bundzten and others, 1994). The schistose rocks are mostly phyllonites with slip schistosity approximately parallel to lithologic contacts and original bedding. The schistosity strikes northeast to east-northeast and dips about 30 degrees southeast.

The metamorphic rocks here are probably part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993, Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Local silicification and pervasive introduction of pyrite and ankerite near vein systems.

Age of mineralization:

Mid-Cretaceous; veins post-date regional metamorphism and are probably similar in age to other lode gold deposits of Seward Peninsula.

Deposit model:

Low sulfide Au-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:**

Extensive surface trenching and some drilling were conducted in the 1990's. Extensive work began in the area in 1994 when the Lajacks conducted a soil survey and located 20 State of Alaska claims. The project as developed by Cominco American included 92 DIV (name) claims, 40 Lost claims, and 17 East claims. Surrounding lands are a patchwork of open state land, claims by competitors, and Native selected land. The DIV claims built on the core staked by the Lajacks. In 1995, Cominco American conducted an extensive trench and soil prospecting program. The best single trench was D-11 at the divide between Quartz Creek and Boer Creek. This trench had 55 feet with 0.437 ounce of gold per ton.

Cominco American continued with a drilling program in 1996. In general the drilling program found less gold than surface trenching, although drill results locally indicated significant mineralization, including 10 feet with 0.235 ounce of gold per ton in Div-9 southeast of Boer Mountain and 37 feet with 0.055 ounce of gold per ton in Div-3, about 2,000 feet east of Boer Mountain.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Metal Ridge East**Site type:** Prospect**ARDF no.:** NM059**Latitude:** 64.8349**Quadrangle:** NM D-1**Longitude:** 165.4022**Location description and accuracy:**

This prospect is on the ridge between Silver and Short Creeks, north tributaries to upper Stewart River, at an elevation of 1,550 feet. It is in the eastern part of a large claim block held by Altar Resources over what is called the Metal Ridge prospect. This claim block extends from Short Creek west across Silver Creek to Windy Creek and north to the headwaters of Charlie Creek (NM048). The location used here is the approximate center of the eastern part of the claim block.

Commodities:**Main:** Au, Cu, Pb, Zn**Other:** Ag, As**Ore minerals:** Arsenopyrite (?), chalcopyrite (?), galena (?), gold (?), sphalerite (?)**Gangue minerals:** Quartz (?)**Geologic description:**

Reconnaissance soil, rock, and stream sediment geochemical surveys by Cominco American in 1992, and subsequently by Altar Resources, have defined an approximately east-west trending zone of anomalous gold, copper, lead, zinc, arsenic, and locally bismuth values that define the Metal Ridge prospect. On the ridge between Silver and Short Creeks, anomalous values in soils and rocks were as much as 110 ppb gold, 1,180 ppm zinc, 223 ppm copper, 246 ppm lead, and 1,470 arsenic (Altar Resources, 1999, unpublished report). The prospect is near the contact between lower grade metasedimentary rocks with relict sedimentary structures to the south and amphibolite facies metasedimentary rocks to the north (Bundzten and others, 1994). The contact between the higher and lower grade metamorphic assemblages may be a large normal fault that dropped the block to the south down.

The metamorphic rocks are probably part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies

rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 (thesis); Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Oxidation.

Age of mineralization:

Possibly Paleozoic or older if stratabound, but probably mid-Cretaceous if the deposits are in veins and disseminations that post-date metamorphism.

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

Production Status: None

Site Status: Active

Workings/exploration:

Reconnaissance soil, rock, and stream sediment geochemical surveys by Cominco American in 1992, and subsequently by Altar Resources, have defined the Metal Ridge prospect.

Production notes:**Reserves:****Additional comments:****References:**

Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998; Altar Resources, 1999.

Primary reference: Altar Resources, 1999

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Metal Ridge West**Site type:** Occurrence**ARDF no.:** NM060**Latitude:** 64.8304**Quadrangle:** NM D-1**Longitude:** 165.4476**Location description and accuracy:**

The occurrence is on the crest and side slopes of a southerly trending ridge between Windy and Silver Creeks, north tributaries of the upper Stewart River. It is in the western part of a large claim block held by Altar Resources over what is called the Metal Ridge prospect. This claim block extends from Short Creek west across Silver Creek to Windy Creek and north to the Charlie Creek drainage (NM048). The location used here is centered on the area in the western part of the claim block where soil and rock samples contain highly anomalous metal contents.

Commodities:**Main:** Au, Bi, Cu, Pb, Zn**Other:** Ag, As**Ore minerals:** Arsenopyrite (?), bismuthinite (?), chalcopyrite (?), galena (?), gold (?), sphalerite (?)**Gangue minerals:** Quartz (?)**Geologic description:**

Reconnaissance soil, rock, and stream sediment geochemical surveys by Cominco American in 1992, and subsequently by Altar Resources, have defined an east-west trending zone of anomalous gold, copper, lead, zinc, arsenic, and locally bismuth values that define the Metal Ridge prospect. On the ridge between Silver and Windy Creeks, anomalous values in soils and rocks were as much as 310 ppb gold, 2,328 ppm zinc, 296 ppm copper, 442 ppm lead, 7,065 ppm arsenic, and 48 ppm bismuth (Altar Resources, 1999, unpublished report). Surface materials are highly oxidized and original sulfide minerals have not been identified. The zone of anomalous metal contents in rocks and soils extends for about 3,000 feet along the ridge crest at this locality. This mineralized zone is about 1.4 miles southeast of the quartz-bismuth-gold veins of Charlie Creek (NM048). This prospect is near the contact between lower grade metasedimentary rocks with relict sedimentary structures to the south and amphibolite facies metasedimentary rocks to the north (Bundzten and others, 1994). The contact between the higher and lower grade metamorphic assemblages may be a large normal fault that drops the block to the south

down.

The metamorphic rocks are probably part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 (thesis); Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Oxidation.

Age of mineralization:

Probably mid-Cretaceous.

Deposit model:

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

Production Status: None

Site Status: Active

Workings/exploration:

Reconnaissance soil, rock, and stream sediment geochemical surveys by Cominco American in 1992, and subsequently by Altar Resources, have defined the Metal Ridge prospect.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato

and Wright, 1997; Amato and Wright, 1998; Altar Resources, 1999.

Primary reference: Altar Resources, 1999

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Stewart River (above Mountain Creek)**Site type:** Mine**ARDF no.:** NM061**Latitude:** 64.8013**Quadrangle:** NM D-1**Longitude:** 165.4691**Location description and accuracy:**

Gold occurs on the left limit (south side) of Stewart River above Mountain Creek and below Fred Creek. Mining was reported at two or three localities above Mountain Creek, so the location is approximate but probably within about 1,000 feet of the coordinates. This is locality 83 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining above Mountain Creek on Stewart River was reported in the early years of the Nome district. Smith (1909, p. 280) noted mining, almost certainly small scale, at 'two or three camps' along Stewart River above Mountain Creek.

Stewart River and its tributary Mountain Creek have floodplains of Holocene alluvium as much as about 0.2 mile wide that are developed on modified drift of the Nome River glaciation. The downstream limit of the slightly modified drift of the Stewart River glaciation is about 1 mile above the confluence of Mountain Creek and Stewart River (Bundtzen and others, 1994). Some placer gold could, therefore, have been derived by reworking slightly auriferous glacial drift derived ultimately from the Kigluaik Mountains and closer gold lodes, as in the Divide Creek area (NM057, NM058, NM111, NM118). Some gold was probably derived from Fred Creek, the next upstream southern tributary, which is known to be auriferous (NM064). Also, the divide between upper Mountain and upper Goldbottom Creeks has little relief, and gold in this area could have been derived from the major fault system that hosts the California lode in upper Goldbottom Creek (NM062). As mapped by Hummel (1962 [MF 242]) and one of the compilers (C.C. Hawley), this fault projects north into lower Fred Creek and the Stewart River valley; it could contain other lode gold deposits like the California lode.

Alteration:**Age of mineralization:**

In large part Holocene, with gold derived from reworking of Pleistocene drift or fed by Fred and Mountain Creeks.

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:

Placer gold mining above Mountain Creek on Stewart River was reported in the early years of the Nome district. Smith (1909, p. 280) noted mining, almost certainly small scale, at 'two or three camps' along Stewart River above Mountain Creek.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1909; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Smith, 1909

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): California; Connolly and Jensen (or Jannsen)

Site type: Mine

ARDF no.: NM062

Latitude: 64.7698

Quadrangle: NM D-1

Longitude: 165.4491

Location description and accuracy:

The California mine is in the headwaters of Goldbottom Creek. The main workings are in and near a west-flowing unnamed tributary at the end of the jeep trail at the north end of the Snake River road. This tributary was called Henry Gulch by Cathcart (1922, p. 253). The mine is on the boundary between section 25, T. 8 S., R. 34 W., and section 30, T. 8 S., R. 33 W., Kateel River Meridian. The mine is located within about 500 feet of the coordinates. It is locality 3 of Hummel (1962 [MF 248]) and locality 22 of Cobb (1972 [MF 46], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Ag, Mo, Sb, W

Ore minerals: Arsenopyrite, gold, molybdenite (?), scheelite, stibnite

Gangue minerals: Quartz

Geologic description:

The California vein was discovered and developed before 1908 (Smith, 1908; Chapin, 1914 [B 592-L, p. 397-407]; Mertie, 1918 [B 451-458]). It is localized in a subsidiary shear zone to a north- to northeast-striking regional fault. The lode is exposed in shallow cuts in a west-draining side canyon to upper Goldbottom Creek. It consists of contorted, sheared, and slickensided schist and quartz masses as much as 3 feet across in a zone that strikes about N 10 W and dips 80 to 85 degrees east. The quartz masses reportedly assayed as much as about 2.5 ounces of gold per ton, but only about 0.4 or 0.5 ounce of gold per ton were recovered by processing. Mr. Jensen, an owner at one time, retained specimens from the California lode of very rich gold ore (Pearse Walsh, oral communication, 1995). Small amounts of pyrite, arsenopyrite, and stibnite accompany the gold, and some molybdenum and tungsten values have been reported (Mertie, 1918 [B 662-I, p. 451-458]; Wedow and others, 1952, p. 35). Higher grade ore may be confined to lenticular ladder zones within the major shear zone.

The California lode was developed by a 70-foot decline that was reported to be in vein material to a depth of 33 feet. The ore was processed by a jaw crusher and stamp mill

that may not have crushed ore fine enough to liberate all the gold. Some development was reported in 1932; in 1938 about 100 feet of drift was driven, and some ore was milled (Smith, 1934 [B 857-A]; 1939). Kennecott Exploration Company explored the property with trenches and three diamond drill holes in 1995 and found mineralized rocks with low gold grades.

The structure that localizes the California lode is subsidiary to a regional fault that strikes north- to north-northeast and can be traced southerly to at least Bangor Creek. The regional fault zone is hundreds of feet wide, and rock within the zone is highly contorted, graphitic mica schist (C.C. Hawley, written communication, 1995). The fault probably continues to the north-northeast into lower Fred Creek and the Stewart River valley, where it is covered by alluvium. South-southwest of the California lode, massive quartz boulders as much as several feet across occur as surface float along the fault as far as Goldbottom Creek. In addition, highly graphitic quartz veins, which resemble the main lode, occur in an east-draining side canyon to Goldbottom Creek about 1,200 feet southwest of the main California incline. At this point, the main, north- to north-northeast-trending shear zone is about 1,000 feet across. Gold-bearing veins, such as the California lode, are possibly ladder structures within the main shear zone. Hummel (1962 [MF 248]), Sainsbury, Hummel, and Hudson (1972), and Bundtzen and others (1994) mapped the major Penny River fault of north-east strike about one-half mile west of the California lode. On the basis of mapping by one of the compiler's (C.C. Hawley), the fault exposed at the California lode is a major branch of the Penny River fault, or it is the main Penny River fault and the fault mapped by others is a subsidiary structure.

About 250 feet east of the main California decline, non-contorted quartz-mica schist is overlain by the main marble unit of the Mount Distin area. This is the massive marble unit of Bundtzen and others (1994); it may have a Paleozoic protolith, but most of the metasedimentary rocks in this area are part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). At this location, the marble is folded into an open, north-trending syncline at a high angle to the main, east-west Mount Distin syncline.

The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Extensive iron-staining of the host schist reflects oxidized pyrite or arsenopyrite.

Age of mineralization:

Mid-Cretaceous?; structures controlling deposits post-date regional metamorphism - mineralization could be similar in age to other lode gold deposits of Seward Peninsula.

Deposit model:

Low sulfide Au-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: Probably inactive

Workings/exploration:

The California lode was developed by a 70-foot decline that was reported to be in vein material to a depth of 33 feet. There are shallow pits, including a pit on the marble-schist contact about 250 feet east of the California incline. This pit has abundant bluish quartz. Another pit is about 1,200 feet southwest of the incline in a side canyon on the west side of Goldbottom Creek.

The ore was processed by a jaw crusher and stamp mill that may not have crushed ore fine enough to liberate all the gold. Some development was reported in 1932; in 1938 about 100 feet of drift was driven and some ore was milled (Smith, 1934 [B 857-A], 1939 [B 917-A]). Kennecott Exploration Company explored the property with trenches and three diamond drill holes in 1995 and found mineralized rocks with low gold grades.

Production notes:

Small production in early 1900's, also some probably about 1937-38.

Reserves:**Additional comments:**

Complex target within major shear zone.

References:

Smith, 1908; Smith, 1909; Chapin, 1914 (B 592-L); Mertie, 1918 (B 662-I); Cathcart, 1922; Smith, 1934 (B 857-A); Smith, 1939 (B 917-A); Wedow and others, 1952; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (lode near Fred Creek)**Site type:** Prospect**ARDF no.:** NM063**Latitude:** 64.7825**Quadrangle:** NM D-1**Longitude:** 165.4355**Location description and accuracy:**

Mineralized schist occurs about 600 feet southwest of upper Fred Creek (Gulch) in the approximate center of the SW1/4NE1/4 section 19, T. 8 S., R. 33 W., Kateel River Meridian. The location is accurate to within 250 feet of the coordinates.

Commodities:**Main:** Au**Other:** As**Ore minerals:** Gold (?), hematite**Gangue minerals:****Geologic description:**

The basal contact zone of massive marble with schist is mineralized at this locality. The mineralized rock is hematized schist that is anomalous in gold and arsenic; arsenic is inferred to be present in a secondary mineral oxidized from arsenopyrite. This mineralization was found as a result of a soil geochemistry survey, but similar mineralization could exist widely at this stratigraphic and structural contact. The deposit could be the source of most of the gold in the Fred Creek placer (NM064). About 2,400 feet southwest of this prospect are numerous boulders of angular vein quartz float on muskeg soil. The quartz is about on trend with the Penny River fault (branch or main splay) that goes through the California prospect (NM062; C.C. Hawley, written communication, 1995).

The metasedimentary schist and overlying massive marble unit (Bundtzen and others, 1994) are part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998).

Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Oxidation; possible development of secondary layered silicates; sulfidation of contact zone.

Age of mineralization:

Mid-Cretaceous?; structures controlling deposits post-date regional metamorphism - mineralization could be similar in age to other lode gold deposits of Seward Peninsula.

Deposit model:

Possible low sulfide, Au-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:** Probably inactive**Workings/exploration:**

The area was explored by Kennecott Exploration Company in 1994. Kennecott extended an earlier soil geochemistry survey that was confined to the immediate area of the California mine (NM062). The extended survey found soils anomalous in gold and arsenic near the basal contact of massive marble in Fred Creek. Quartz boulders were found and mapped along the survey lines. Reconnaissance along the apparent northeast-trend of mineralization led to discovery of old hand placer workings in Boulder Creek, the next (northeast) tributary to Stewart (Ben Porterfield, oral communication, 1995). A trench cut by Kennecott in 1996 found a 200-foot-wide fault zone in the Fred Creek lode prospect area. The area has been further explored by Consolidated Aston.

Production notes:**Reserves:****Additional comments:**

Basal contact zone of massive marble is a favorable horizon in the Fred Creek area; also a major fault, probably related to the Penny River fault traverses the area.

References:

Sainsbury, Coleman, and Kachadoorian, 1970; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995;

Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Fred Creek (or Fred Gulch--placer)**Site type:** Mine**ARDF no.:** NM064**Latitude:** 64.7840**Quadrangle:** NM D-1**Longitude:** 165.4247**Location description and accuracy:**

Fred Creek is a southern tributary of Stewart River. The creek has been mined in about a half-mile stretch where it leaves the hills northwest of Mount Distin. The placer is mainly in the NE1/4 section 19, T. 8 S., R. 33 W., Kateel River Meridian. The location is the approximate mid-point of tailings along Fred Creek and is accurate, along the creek, to within about 1,000 feet of the coordinates. This is locality 84 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Sn**Ore minerals:** Cassiterite, gold**Gangue minerals:****Geologic description:**

Small-scale placer gold mining took place by 1906 in Fred Creek downstream from the basal massive marble (Bundtzen and others, 1994) contact with schist (Moffit, 1913). Hess (1906, p. 157) reported minor cassiterite in Fred Creek, which he thought could have been derived from granitic rocks (orthogneiss) in the Mount Distin region. The physical character of the mine tailings also indicates that the placer deposit has been worked mechanically since 1930. Fred Creek drains across the basal contact of massive marble with metasedimentary schist. The contact is poorly exposed in the creek, but about 600 feet to the southwest, gold-bearing hematitic schist occurs immediately below the massive marble (NM063). This lode prospect seems to be stratabound but also is very close to the projection of a main branch of the Penny River fault, which could also be auriferous.

Alteration:**Age of mineralization:**

Holocene.

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:

Fred Creek appears to have been worked in at least two periods. It was mined by 1906 because stream tin was reported by Hess (1906). Moffit (1913) also noted mining below the marble contact. Some of the creek was been worked in more recent years by small-scale mechanical methods; there are a few buildings that have been constructed at least from the 1930's, and some of the tailings appear to be less than 30 years old. The area was explored by Kennecott Exploration Company in 1995; also by Cominco American. Some exploration, mainly for lode gold deposits, took place in 1998 and 1999.

Production notes:**Reserves:****Additional comments:**

Gold in part derived from basal contact zone of massive marble.

References:

Hess, 1906; Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Jackpot**Site type:** Prospect**ARDF no.:** NM065**Latitude:** 64.7950**Quadrangle:** NM D-1**Longitude:** 165.3637**Location description and accuracy:**

The Jackpot prospect is in the eastern headwaters of Boulder Creek, a south tributary to Stewart River. It is in section 16, T. 8 S., R. 33 W., Kateel River Meridian. Alaska State mining claims cover all but the NW1/4NW1/4 of section 16; Jack Gulch is in the southwest quarter of the section. The location is approximate, taken as the center of section 16.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Jackpot claims were located by following up anomalous concentrations of gold, arsenic, and other metals in stream sediments (Daniel Lajack, written communication, 1999). The Jackpot claim block is bisected by a strong fault that strikes northeast; it appears to be a splay of the Penny River fault, an important regional structure that is locally mineralized (Bundtzen and others, 1994). On the Jackpot claims, rocks north of the fault are mainly massive marble, but include a possible layered rhyolitic or granitic unit. Rocks on the south side of the fault are feldspathic, epidote-bearing schist that is probably part of, or transitional into a mafic metavolcanic assemblage derived from Ordovician protoliths (Till and Dumoulin, 1994).

Alteration:**Age of mineralization:****Deposit model:**

Disseminated and stratabound in metamorphic rocks, or in low sulfide Au-quartz veins (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:**

Surface observation and possibly some sampling has been done here.

Production notes:**Reserves:****Additional comments:****References:**

Bundtzen and others, 1994; Till and Dumoulin, 1994.

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Unnamed (near Hed & [and] Strand, NM070)

Site type: Occurrence

ARDF no.: NM066

Latitude: 64.7993

Quadrangle: NM D-1

Longitude: 165.3092

Location description and accuracy:

The occurrence is at the head of a steep, unnamed southwest-flowing tributary to Lost Creek, 2.9 miles northeast of Mount Distin. It is in the NW1/4NW1/4 section 14, T. 8 S., R. 33 W., Kateel River Meridian, at an elevation of about 1,350 feet. It is approximately 0.6 mile north-northwest of the Hed & [and] Strand antimony mine (NM070) and is within the claim block of the Bulk Gold prospect (NM071). This is locality 31 of Hummel (1962 [MF 248]) and it is probably located within about 1,000 feet of the coordinates.

Commodities:

Main: Sb

Other: Au (?)

Ore minerals: Stibnite (?)

Gangue minerals: Quartz (?)

Geologic description:

Hummel (1962 [MF 248]) identified this locality as an antimony occurrence. Stibnite is probably present as is at least a small amount of gold. The occurrence is within the claim block of the Bulk Gold prospect (NM071). It is in massive marble and within 0.1 mile to the east of a strong fault (Hummel, 1962 [MF 248]; Bundzten and others, 1994). Both Hummel (1962 [MF 248]) and Bundtzen and others (1994) map a gneissic granitic intrusive or metavolcanic body in this area.

Alteration:

Age of mineralization:

Deposit model:

Antimony occurrence in marble, possibly simple Sb deposit (Cox and Singer, 1986; model 27d).

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

27d?

Production Status: No

Site Status: Active?

Workings/exploration:

Some surface observation and sampling may have occurred.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Hed & [and] Strand, NM070)

Site type: Occurrence

ARDF no.: NM067

Latitude: 64.7966

Quadrangle: NM D-1

Longitude: 165.3115

Location description and accuracy:

The occurrence is in a steep canyon that trends west and southwest into upper Lost Creek about 0.2 mile north of the confluence of Dahl Creek (not shown on the 1972 edition of the USGS topographic map) with Lost Creek. Dahl Creek is the location of the Hed & [and] Strand antimony mine (NM070). It is about 2.7 miles northwest of Mount Distin and in the western part of the claim block for the Bulk Gold prospect (NM071). It is locality 29 of Hummel (1962 [MF 248]). This occurrence is probably located within about 1,000 feet of the coordinates.

Commodities:

Main: Sb

Other: Au (?)

Ore minerals: Stibnite (?)

Gangue minerals: Quartz (?)

Geologic description:

Hummel (1962 [MF 248]) identified this locality as an antimony occurrence. Stibnite is probably present as is at least a small amount of gold. The occurrence is within the claim block of the Bulk Gold prospect (NM071). It appears to be in massive marble (Hummel, 1962 [MF 248]; Bundtzen and others, 1994) and is probably adjacent to a strong, north-northeast-striking fault (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Probably mid-Cretaceous, similar to most low-sulfide gold deposits and simple antimony veins of the area.

Deposit model:

Antimony occurrence in marble, possibly simple Sb deposit (Cox and Singer, 1986; model 27d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
27d?

Production Status: None

Site Status: Inactive

Workings/exploration:
Surface observation and sampling.

Production notes:

Reserves:

Additional comments:

References:
Hummel, 1962 (MF 248); Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Hed & [and] Strand, NM070)

Site type: Occurrence

ARDF no.: NM068

Latitude: 64.7974

Quadrangle: NM D-1

Longitude: 165.3003

Location description and accuracy:

The prospect is on the west side of the ridge that separates the west Lost Creek and Dorothy Creek drainages; it is about 3 miles northeast of Mount Distin. It is about 0.4 mile north-northeast of the Hed & [and] Strand antimony mine (NM070) and at an elevation of almost 1,500 feet. This is locality 32 of Hummel (1962 [MF 248]). This occurrence is probably located within about 1,000 feet of the coordinates.

Commodities:

Main: Sb

Other: Au (?)

Ore minerals: Stibnite (?)

Gangue minerals: Quartz (?)

Geologic description:

Hummel (1962 [MF 248]) identified this locality as an antimony occurrence. Stibnite is probably present, as is at least a small amount of gold. The occurrence is within the claim block of the Bulk Gold prospect (NM071). It appears to be in massive marble and near feldspathic rocks, including granitic orthogneiss (Hummel, 1962 [MF 248]; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Probably mid-Cretaceous.

Deposit model:

Antimony occurrence in marble, possibly simple Sb deposit (Cox and Singer, 1986; model 27d).

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

27d ?

Production Status: None

Site Status: Active?

Workings/exploration:

Surface observation and sampling.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Hed & [and] Strand, NM070)

Site type: Occurrence

ARDF no.: NM069

Latitude: 64.7946

Quadrangle: NM D-1

Longitude: 165.3024

Location description and accuracy:

The occurrence is on the ridge north of Dahl Creek (not shown on the 1972 edition of the USGS topographic map), about 2.8 miles northeast of Mount Distin. Dahl Creek is a west-flowing upper tributary of Lost Creek, a south tributary of Stewart River. The occurrence is at an elevation of about 1,450 feet and about 1,000 feet north of the Hed & [and] Strand antimony mine (NM070); it is included within the claim block of the Bulk Gold prospect (NM071). It is locality 30 of Hummel (1962 [MF 248]), and possibly locality 45 of Hummel (1975). This occurrence is probably located within about 1,000 feet of the coordinates.

Commodities:

Main: Sb

Other: Au (?)

Ore minerals: Stibnite (?)

Gangue minerals: Quartz (?)

Geologic description:

Hummel (1962 [MF 248]) identified this locality as an antimony occurrence. It appears to be near locality 45 of Hummel (1975), which is shown as a sulfide-bearing silicified marble. The occurrence is assumed to contain stibnite and possibly red and yellow secondary oxide minerals of antimony. It is one of numerous occurrences of antimony in the area, most of which contain at least a small amount of gold.

The area near the occurrence has been mapped by Hummel (1962 [MF 248]) and by Bundtzen and others (1994). The two maps show appreciably different geology, and the differences cannot be reconciled without additional field work. In general, the rocks exposed near the occurrence are the so called mixed unit of Bundtzen and others (1994), including massive marble and feldspathic epidote schist. Hummel (1962 [MF 248]) mapped a strong, north-northeast-striking fault about 1,000 feet west of the occurrence and another, less certain, northeast-striking fault essentially at the occurrence.

Alteration:

Age of mineralization:

Probably mid-Cretaceous.

Deposit model:

Antimony occurrence, possibly simple Sb deposit (Cox and Singer, 1986; model 27d).

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

27d?

Production Status: None

Site Status: Active?

Workings/exploration:

Some surface observation, digging of shallow prospect pits, and sampling may have occurred.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Hummel, 1975; Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Hed & Strand (Head and Strand)**Site type:** Mine**ARDF no.:** NM070**Latitude:** 64.7917**Quadrangle:** NM D-1**Longitude:** 165.3046**Location description and accuracy:**

The Hed & [and] Strand mine is in an east fork of upper Lost Creek, a south tributary to Stewart River; it is about 2.7 miles northeast of Mount Distin. The east fork tributary is known as Dahl Creek or Dahl Gulch (Cathcart, 1922, p. 224). The property is mainly in the SW1/4 section 14, T. 8 S., R. 33 W., Kateel River Meridian. The location given is in the approximate center of the easternmost of two patented claims and near the main workings of the mine. The Hed & [and] Strand mine is locality 8 of Hummel (1962 [MF 248]) and locality 30 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); it is located within about 500 feet of the coordinates.

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Arsenopyrite, gold, pyrite, stibnite**Gangue minerals:** Calcite, quartz**Geologic description:**

The Hed & [and] Strand mine was developed by an adit and drifts on stibnite-bearing quartz veins in metamorphic rocks. The main vein was intersected 90 feet in from the portal of the adit; it strikes N 45 E and dips 48 N. At this point, the vein was followed by a 100-foot drift to the northeast and a 140-foot drift to the southwest (Mertie, 1918 [B 662-I, p. 425-449]). At the face of the 100-foot drift, the vein was about 2 feet wide and composed mostly of sheared schist with thin seams of stibnite on the hanging and foot walls. Where intersected in the adit, the vein was 4 feet wide; it consisted of white quartz and stibnite, with stibnite forming a footwall mass about 2 feet thick. A second subparallel vein was found 190 feet from the adit portal; it was drifted on for 170 feet. Lower grade material contains quartz and pyrite; Brooks (1916, p. 54-56) reported a mineralized mica schist with calcite, pyrite, and arsenopyrite. Mertie (1918, p. 438) reported that quartz with stibnite, exposed in the creek near the mine, assayed about 0.30 ounce of gold per ton; the associated stibnite contained about 0.1 ounce of gold per ton. The veins pinch and swell, and, as is typical of simple stibnite veins, the ore occurs in pods and kid-

neys (Bliss and Orris, 1986, p. 183-186).

About 106 tons of stibnite ore were mined and shipped in 1915 and 1916. This ore had a low gold content. Development continued at the mine in the late 1920's and early 1930's. When Anderson (1947) visited the mine in about 1943, about 10 tons of 30 percent antimony ore were on the dumps and about 30 to 40 tons were exposed in mine workings. At that time, there were about 1,000 feet of accessible mine workings.

The schist in the adit had a strike of about N 15 W and dipped at a low angle to the northeast. The main workings appear to lie within quartz-mica schist and a feldspar-rich epidote-bearing schist near a contact with massive marble (Bundtzen and others, 1994). The epidote-bearing schist may be part of a regional mafic metavolcanic assemblage that has an Ordovician protolith (Till and Dumoulin, 1994). Hummel (1962 [MF 248]) mapped an approximately east-west high-angle fault in Dahl Creek; the fault is upthrown on the south side. Earlier authors, including Mertie (1918 [B 662-I, p. 425-449]) and Cathcart (1922), noted a nearby metamorphosed granite body as possibly related to the mineralization, and Hummel (1962 [MF 248]) showed a small granite orthogneiss on the ridge east of the prospect. Granitic orthogneisses mapped by Bundtzen and others (1994) are about 1 mile north and 1 mile south of the prospect. The area is too complex to decipher with 1:63,360-scale mapping.

The metamorphic rocks in this area are part of the Nome Group derived from Proterozoic or early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997). Lode antimony mineralization is inferred to be of the same approximate age.

Alteration:

Quartz veining and apparently some disseminated pyrite and arsenopyrite in nearby schist.

Age of mineralization:

Mid-Cretaceous?; structures controlling deposits post-date regional metamorphism; mineralization could be similar in age to lode gold deposits of Seward Peninsula.

Deposit model:

Simple Sb deposit (Cox and Singer, 1986; model 27d).

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

27d

Production Status: Yes; small

Site Status: Active

Workings/exploration:

Stibnite was discovered in Dahl Creek in about 1909, and development followed soon after. Workings consist of surface pits, an adit, and underground cross-cuts, drifts, and small stopes. Most of the workings were driven before 1918, and ore was produced and shipped in 1915 and 1916. Development continued at the mine in the late 1920's and early 1930's. When Anderson (1947) visited the mine in about 1943, about 10 tons of 30 percent antimony ore were on the dumps and about 30 to 40 tons were exposed in mine workings. At that time, there were about 1,000 feet of accessible mine workings. There was recent activity nearby in 1996-98 at the Bulk Gold prospect (NM071 and 072,) which includes the two patented Hed & [and] Strand claims.

Production notes:

About 106 tons of stibnite ore were mined and shipped in 1915 and 1916. This ore had a low gold content. Development continued at the mine in the late 1920s and early 1930s. When Anderson (1947) visited the mine in about 1943, about 10 tons of 30 percent antimony ore were on the dumps and about 30 to 40 tons were exposed in mine workings. At that time, there were about 1,000 feet of open mine workings.

Reserves:

Probably a few tens of tons of stibnite ore were left exposed in mine workings (Anderson, 1947).

Additional comments:

References:

Brooks, 1916; Mertie, 1918 (B 622-I); Cathcart, 1922; Anderson, 1947; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Bliss and Orris, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Bulk Gold (West)**Site type:** Prospect**ARDF no.:** NM071**Latitude:** 64.7912**Quadrangle:** NM D-1**Longitude:** 165.2874**Location description and accuracy:**

The Bulk Gold prospect of Altar Resources consisted of a large block of State claims south of Dorothy Creek, southeast of Stewart River, and west of Nome River. Because of the size of the claim block, it is divided in two parts by the section line that separates sections 14 and 23 from sections 13 and 24, T. 8 S., R. 33 W., Kateel River Meridian. The west block includes the Hed & [and] Strand mine (NM070). The coordinates are the center of the large block of claims that covers all of sections 14 and 23 and the east part of section 15.

Commodities:**Main:** Au, Sb**Other:** As**Ore minerals:** Arsenopyrite, gold, stibnite**Gangue minerals:** Calcite, quartz**Geologic description:**

The Bulk Gold prospect was identified from stream sediment sampling and soil samples collected between 1994 and 1998 (Daniel Lajack, written communication, 1999). The geochemical work was followed by trenching and two short diamond drill holes in 1998. Work on the prospect has been done by Altar Resources and Teck Exploration Company. Teck Exploration Company ran a soil survey that extended from west of the Hed & [and] Strand mine (NM070) to past the head of Dorothy Creek in the east Bulk Gold prospect). Soils collected above the Hed & [and] Strand mine contained as much as 550 ppb gold, 884 ppm arsenic and 66 ppm antimony. Upper Dahl Creek, above the Hed & [and] Strand claims, was highly anomalous in gold, arsenic, and antimony. A sample in the saddle at the head of Dahl Creek contained 1.65 grams of gold per tonne, 9,510 ppm arsenic and 48 ppm. This saddle area was trenched and drilled in 1998. Four pits were dug at 300-foot intervals across the saddle. Bedrock samples from these pits contained 575 to 1,210 ppb gold and from 3,960 to 10,000 ppm arsenic. Anomalous results were also found in 30-foot and 50-foot diamond drill holes. Although antimony is somewhat anomalous in the samples and antimony occurrences have been identified in the area

(NM066 to NM070), the prospect is mainly characterized by elevated gold and arsenic values.

The west part of the Bulk Gold prospect is mainly underlain by massive marble and feldspathic epidote-bearing schist. The epidote-bearing schist may be part of a regional mafic metavolcanic assemblage that has an Ordovician protolith (Till and Dumoulin, 1994). Hummel (1962 [MF 248]) mapped an approximately east-west, high-angle fault in Dahl Creek; the fault is upthrown on the south side. Earlier authors, including Mertie (1918 [B 662-I, p. 425-449]) and Cathcart (1922) noted a nearby metamorphosed granite body as possibly related to the mineralization at the Hed & [and] Strand mine, and Hummel (1962 [MF 248]) and Bundtzen and others (1994) mapped granitic orthogneisses in the area. The area is too complex to decipher with 1:63,360-scale mapping.

The metamorphic rocks in this area are part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Quartz veining and apparently some disseminated pyrite and arsenopyrite in nearby schist.

Age of mineralization:

Mid-Cretaceous?; structures controlling deposits post-date regional metamorphism; mineralization could be similar in age to many lode gold deposits of Seward Peninsula.

Deposit model:

Possibly disseminated and stratabound in metamorphic rocks, or in low sulfide Au-quartz veins (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:**

Work has consisted of stream sediment sampling, followed by soil geochemistry and some trenching and drilling in 1998.

Production notes:**Reserves:****Additional comments:**

The project found widespread anomalies including a strong gold-arsenic system in upper Dahl Creek. Controls on mineralization are not defined.

References:

Mertie, 1918 (B 662-D); Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Bulk Gold (East)**Site type:** Prospect**ARDF no.:** NM072**Latitude:** 64.7967**Quadrangle:** NM D-1**Longitude:** 165.2629**Location description and accuracy:**

The east part of the Bulk Gold prospect of Altar Resources comprises land at the head of Dorothy Creek and east of the ridge at the head of Dahl Creek, a tributary to Los Creek, but not shown on the 1972 edition of the USGS topographic map. The east block includes sections 13 and 24, T. 8 S., R. 33 W., and part of section 18 in T. 8 S., R. 32 W., Kateel River Meridian. The location is on a north-trending ridge overlooking the head of Dorothy Creek. It approximately coincides with pits where bedrock contains anomalous arsenic and gold (David Lajack, written communication, 1999). The location of the pits is accurate to within about 500 feet of the coordinates.

Commodities:**Main:** Au, Sb**Other:** As**Ore minerals:** Arsenopyrite, gold, pyrite, scorodite**Gangue minerals:** Quartz**Geologic description:**

The Bulk Gold prospect was identified from stream sediment sampling and soil samples collected between 1994 and 1998 (Daniel Lajack, written communication, 1999). Prospect pits are located just south of the saddle on the south side of hill 1137, immediately north of the center of section 13, T. 8 S., R. 33 W., Kateel River Meridian. Bedrock samples collected from the prospect pits contained from 0.027 to 0.035 ounce of gold per ton and from 7,490 ppm to more than 1 percent arsenic. The arsenic is present as arsenopyrite or its oxidation product, scorodite. Another sample collected about due west of the pits in upper Dorothy Creek contained 0.011 ounce of gold per ton and 1.7 percent arsenic. Antimony values were anomalous in these samples. Controls of mineralization are unknown.

The east part of the Bulk Gold prospect is underlain mostly by massive marble and feldspathic epidote-bearing schist that is probably in thrust contact with the underlying marble (Bundtzen and others, 1994). The epidote-bearing schist may be part of a regional mafic metavolcanic assemblage that has an Ordovician protolith (Till and Dumoulin, 1994).

The prospect pit area is shown by Bundtzen and others (1994) as entirely underlain by marble. Hummel (1962 [MF 248]) mapped several small granitic orthogneiss sills in this area.

The metamorphic rocks in this area are part of the Nome Group derived from Proterzoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Oxidation.

Age of mineralization:

Mid-Cretaceous?; mineralization could be similar in age to many lode gold deposits of Seward Peninsula.

Deposit model:

Possibly disseminated and stratabound in metamorphic rocks, or in low sulfide Au-quartz veins (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 development is hand-dug prospect pits excavated in the period 1994-98, when the area was explored by Teck Exploration Company and Altar Resources.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Hudson and

Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Christian Creek**Site type:** Prospect**ARDF no.:** NM073**Latitude:** 64.7956**Quadrangle:** NM D-1**Longitude:** 165.2002**Location description and accuracy:**

Christian Creek is a west-flowing tributary to Nome River; it enters Nome River between Sulphur Creek and Rocky Mountain Creek (NM082). The location is accurate; it is the approximate mid-point of tailings on the lower creek about a quarter of a mile above its confluence with Nome River. This is locality 42 of Hummel (1975) and locality 106 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, scheelite (?)**Gangue minerals:****Geologic description:**

Christian Creek has been placer mined for gold over about 1,000 feet of its length starting a half-mile upstream of its confluence with Nome River. This mining may have taken place after WW II. The occurrence of scheelite in a nearby lode (NM075) suggests that scheelite could be found in the concentrates of Christian Creek. Christian Creek appears to be the northern limit of a zone of scheelite deposits that can be traced as far south as Nelson Gulch (NM083). Bedrock in the Christian Creek drainage is mostly calcareous schist and marble that is close to the axis of the Mount Distin syncline defined by Hummel (1962 [MF 248]). Hummel mapped a prominent north-trending lineament across Christian Creek at about the lower end of the placer tailings.

Alteration:**Age of mineralization:**

Holocene.

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:** Probably inactive**Workings/exploration:**

Shallow mechanical placer mining took place along about 1,000 feet of the creek, possibly after WW II.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Unnamed (Christian Creek)**Site type:** Prospect**ARDF no.:** NM074**Latitude:** 64.7933**Quadrangle:** NM D-1**Longitude:** 165.1854**Location description and accuracy:**

The prospect is near the forks on the south side of the canyon of Christian Creek at an elevation of about 500 feet. Christian Creek is an east tributary to upper Nome River. It is locality 33 of Hummel (1962 [MF 248]), and locality 41 of Hummel (1975) and included in locality 31 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located within about 1,000 feet of the coordinates.

Commodities:**Main:** Cu**Other:****Ore minerals:** Chalcopyrite (?), copper carbonates (?)**Gangue minerals:** Quartz**Geologic description:**

The prospect is a copper-bearing mineral occurrence contained within calcareous metasedimentary rocks (Hummel, 1962 [MF 248]). It appears to be on the north or hanging wall side of the same fault structure that is adjacent to a nearby scheelite prospect (NM075). The prospect belongs to the same class of stratabound copper deposits as those at Copper Creek (NM053) and Copper Mountain (NM054) identified by Hummel (1975) as occurrences or prospects in silicified marble, that contain visible sulfide or other ore minerals.

Alteration:

Possible development of silica-rich layers; formation of white mica; bleaching of marble; oxidation.

Age of mineralization:

Late Proterozoic, early Paleozoic, or mid-Cretaceous.

Deposit model:

Carbonate-hosted, copper-bearing silica-rich rock.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

A surface prospect pit or trench may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Christian Creek)

Site type: Prospect

ARDF no.: NM075

Latitude: 64.7926

Quadrangle: NM D-1

Longitude: 165.1917

Location description and accuracy:

The prospect is on the west side of a north-trending ridge on the south side of Christian Creek; the floodplain of Nome River flanks the ridge on the west. The prospect is at an elevation of about 700 feet. It is locality 24 of Hummel (1962 [MF 248]) and included in locality 31 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located within about 1,000 feet of the coordinates.

Commodities:

Main: W

Other:

Ore minerals: Scheelite

Gangue minerals: Quartz (?)

Geologic description:

The prospect is a vein-type occurrence of scheelite (locality 40, Hummel, 1975). It is mapped as being on the north or hanging wall side of a east-northeast-striking fault (Hummel, 1962 [MF 248]). It is the northernmost of several scheelite occurrences near Christian Creek, Rocky Mountain Creek, and Nelson Gulch on the east side of Nome River.

The prospect is in micaceous calc-schist; the schistosity strikes north-northeast and dips at shallow to moderate angles to the east.

Alteration:

Quartz veining?

Age of mineralization:

Deposit model:

Low-sulfide, quartz-scheelite vein?

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

Production Status: Undetermined.

Site Status: Probably inactive

Workings/exploration:

The vein is opened by a pit or other shallow surface workings.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near head of Rocky Mountain Creek)

Site type: Prospect

ARDF no.: NM076

Latitude: 64.7858

Quadrangle: NM D-1

Longitude: 165.1706

Location description and accuracy:

The prospect is at the head of Rocky Mountain Creek, an east tributary to upper Nome River, at an elevation of about 1,000 feet. The prospect is locality 34 of Hummel (1962 [MF 248]) and is located within about 1,000 feet of the coordinates.

Commodities:

Main: Au (?)

Other:

Ore minerals: Arsenopyrite, pyrite, pyrrhotite (?)

Gangue minerals:

Geologic description:

Hummel (1962 [MF 248]) identified this locality as an iron sulfide occurrence and part of a group of prospects that contained pyrite, arsenopyrite, and at some of the prospects, pyrrhotite. The sulfides may be disseminated or in veins. The prospect is near or at the upper contact of calcareous schist with a marble layer; the rocks strike northwest and dip northeast (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Probably mid-Cretaceous or younger if in cross-cutting veins.

Deposit model:

Vein-type occurrence of pyrite and arsenopyrite in schist (?).

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

Production Status: Undetermined.

Site Status: Probably inactive

Workings/exploration:

A surface pit or trench may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Thompson**Site type:** Prospect**ARDF no.:** NM077**Latitude:** 64.7831**Quadrangle:** NM D-1**Longitude:** 165.1694**Location description and accuracy:**

The Thompson prospect is near the head of Rocky Mountain Creek, an east tributary to upper Nome River, at an elevation of about 1,400 feet. It is locality 19 of Hummel (1962 [MF 248]) and locality 37 of Hummel (1975) and included in locality 32 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located within about 1,000 feet of the coordinates.

Commodities:**Main:** Sb, Zn**Other:****Ore minerals:** Sphalerite (?), stibnite (?)**Gangue minerals:****Geologic description:**

The Thompson prospect is a vein or fault-controlled occurrence containing zinc and antimony minerals (Hummel, 1975) that are assumed to be sphalerite and stibnite. The prospect is near or at the upper contact of calcareous schist with a marble layer; the rocks strike northwest and dip northeast (Hummel, 1962 [MF 248]). The Thompson prospect is one of several of diverse type and metal content in the general vicinity of Rocky Mountain Creek, Nelson Gulch, and Christian Creek.

Alteration:**Age of mineralization:**

Probably mid-Cretaceous or younger if a vein occurrence.

Deposit model:

Vein (?) occurrence of antimony and zinc minerals in calcareous metasedimentary rocks.

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Probably discovered in the World War II era during the search for strategic metals.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Spring**Site type:** Occurrence**ARDF no.:** NM078**Latitude:** 64.7840**Quadrangle:** NM D-1**Longitude:** 165.1770**Location description and accuracy:**

The Spring antimony occurrence is in upper Rocky Mountain Creek, an east tributary to upper Nome River, at an elevation of 1,150 feet. It is locality 17 of Hummel (1962 [MF 248]) and included in locality 32 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located within about 1,000 feet of the coordinates.

Commodities:**Main:** Sb**Other:** Au (?)**Ore minerals:** Stibnite (?)**Gangue minerals:** Quartz (?)**Geologic description:**

Hummel (1962 [MF 248]) identified the Spring prospect as an antimony occurrence. The ore mineral is assumed to be stibnite, possibly with quartz and some gold values, that occurs in veins that cross-cut the metasedimentary rocks. The prospect is in, or stratigraphically above a massive marble intercalated in metasedimentary schist (Hummel, 1962 [MF 248]).

Alteration:**Age of mineralization:**

Probably mid-Cretaceous or younger if a vein occurrence.

Deposit model:

Antimony-bearing vein (?) in metasedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None

Site Status: Probably inactive

Workings/exploration:

A surface pit or trench may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (on hill 1231)

Site type: Occurrence

ARDF no.: NM079

Latitude: 64.7844

Quadrangle: NM D-1

Longitude: 165.1902

Location description and accuracy:

This occurrence is on the west side of hill 1231 at an elevation of about 1,300 feet; it is on the east side of the upper Nome River valley between Christian and Rocky Mountain Creeks. It is locality 23 of Hummel (1962 [MF 248]).

Commodities:

Main: W

Other:

Ore minerals: Scheelite

Gangue minerals: Quartz (?)

Geologic description:

Hummel (1962 [MF 248]) identified this locality as a tungsten occurrence. The ore mineral is assumed to be scheelite, probably with quartz, in veins that cross-cut the metasedimentary rocks. It is one of several scheelite occurrences in the Christian Creek, Rocky Mountain Creek, and Nelson Gulch area on the east side of Nome River. This occurrence is apparently in metasedimentary schist near a contact with intercalated marble (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Probably mid-Cretaceous or younger if a vein occurrence.

Deposit model:

Scheelite-bearing quartz vein (?) in metasedimentary rocks.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

A surface pit or trench may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Lindfors**Site type:** Prospect**ARDF no.:** NM080**Latitude:** 64.7796**Quadrangle:** NM D-1**Longitude:** 165.1830**Location description and accuracy:**

The Lindfors prospect is in Rocky Mountain Creek, an east tributary to upper Nome River, at an elevation of about 650 feet. It is locality 9 of Hummel (1962 [MF 248]) and included in locality 32 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located to within about 500 feet mile of the coordinates.

Commodities:**Main:** Sb**Other:** Au (?)**Ore minerals:** Stibnite (?)**Gangue minerals:** Quartz (?)**Geologic description:**

Hummel (1962 [MF 248]) identified the Lindfors prospect as an antimony occurrence. The ore mineral is assumed to be stibnite, possibly with quartz and some gold values, in veins that cross-cut metasedimentary rocks. The prospect is in calcareous schist about 200 feet structurally below an intercalated massive marble (Hummel, 1962 [MF 248]).

Alteration:**Age of mineralization:**

Probably mid-Cretaceous or younger if a vein occurrence.

Deposit model:

Antimony-bearing vein (?) in metasedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive

Workings/exploration:

The Rocky Mountain Creek area was prospected for scheelite and other strategic minerals during World War II. Various prospects along the creek were described by Coats (1944) and by Anderson (1947). Some exploration pits or trenches are probably present.

Production notes:**Reserves:****Additional comments:****References:**

Coats, 1944; Anderson, 1947; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nelson Gulch**Site type:** Occurrence**ARDF no.:** NM081**Latitude:** 64.7689**Quadrangle:** NM D-1**Longitude:** 165.1731**Location description and accuracy:**

Nelson Gulch is an unnamed small, west-flowing drainage about one-half mile south of Rocky Mountain Creek. The scheelite occurrence is at an elevation of about 1,450 feet in Nelson Gulch and about 1.4 miles due east of the mouth of Rocky Mountain Creek. The occurrence is locality 14 of Hummel (1962 [MF 248]) and is probably the vein occurrence cited by Coats (1944) as being south of Rocky Mountain Creek. It is included with other nearby tungsten occurrences as locality 20 of Cobb (1975) and is locality 33 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is located within about 500 feet of the coordinates.

Commodities:**Main:** Au, W**Other:****Ore minerals:** Gold, scheelite**Gangue minerals:** Albite, quartz**Geologic description:**

The Nelson Gulch prospect is a scheelite-bearing quartz vein or veins. On the basis of the size of abundant float in the area, the scheelite-bearing vein is as much as 1.5 feet wide (Coats, 1944, p. 4-6). Albite and some gold also occur with the scheelite. The Nelson Gulch prospect is the southernmost of several scheelite occurrences between this locality and the Christian Creek prospect (NM075), 1.6 miles to the north. The rocks in the area consist of interlayered marble and metasedimentary schist (Hummel, 1962 [MF 248]). A prominent marble layer apparently underlies the scheelite-bearing vein. The schistosity and layering strike northerly and dip at shallow angles to the east.

Alteration:**Age of mineralization:**

Probably mid-Cretaceous or younger; post-dates regional metamorphism.

Deposit model:

Low-sulfide, scheelite-bearing quartz vein with some gold.

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

Production Status: No

Site Status: Inactive

Workings/exploration:

The area was explored for scheelite and other strategic minerals during World War II. The lodes were apparently not mined, but attempts were made to recover scheelite from the placers in this area.

Production notes:**Reserves:****Additional comments:****References:**

Coats, 1944; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Coats, 1944

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Rocky Mountain Creek**Site type:** Mine**ARDF no.:** NM082**Latitude:** 64.7702**Quadrangle:** NM D-1**Longitude:** 165.2037**Location description and accuracy:**

Rocky Mountain Creek is an east tributary to upper Nome River. It is about 2 miles south of Christian Creek (NM073). Tailings extend about one-half mile along Rocky Mountain Creek, beginning just east of the Nome-Taylor road. The location is accurate; the coordinates are the mid-point of the placer tailings. The mine is locality 108 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au, Sn, W**Other:****Ore minerals:** Cassiterite, gold, scheelite**Gangue minerals:****Geologic description:**

The lower part of Rocky Mountain Creek was placer mined for gold, probably after WW II. The area was actively prospected for tungsten and other strategic metals during World War II (Coats, 1944), and native gold and small amounts of cassiterite were present with scheelite in heavy mineral concentrates. Rocky Mountain Creek was one of three creeks in the Nome area identified by Anderson (1947) as having notable amounts of cassiterite. Anderson (1947) inferred that the placer cassiterite was derived from the same veins that hosted scheelite. Lode occurrences identified above the placer mine in the Rocky Mountain Creek drainage include the Lindfors (NM080) and Spring (NM078) antimony prospects and the Thomson (NM077) antimony and zinc prospect identified by Hummel (1962 [MF 248]). Coats (1944) reported a narrow vein, mostly composed of quartz and albite but also with about 3 percent scheelite, in Rocky Mountain Creek above the placer. This scheelite occurrence may be locality 34 of Hummel (1962 [MF 248]) near the head of the creek (NM076). Bedrock in the Rocky Mountain Creek drainage is a metasedimentary schist and marble sequence (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Holocene.

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:

Rocky Mountain Creek was worked as a placer mine on a small scale relatively late in the history of the district. It is not mentioned as a placer prospect in reports earlier than World War II.

Production notes:**Reserves:****Additional comments:****References:**

Coats, 1944; Anderson, 1947; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Coats, 1944

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nelson Gulch**Site type:** Mine**ARDF no.:** NM083**Latitude:** 64.7640**Quadrangle:** NM D-1**Longitude:** 165.2000**Location description and accuracy:**

Nelson Gulch is the unnamed creek about a half mile south of Rocky Mountain Creek (NM082) near the center of section 29, T. 8 S., R. 32 W., Kateel River Meridian. It is an east tributary to upper Nome River. It is locality 108 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and is included with other nearby tungsten occurrences as part of locality 20 of Cobb (1975).

Commodities:**Main:** Au, W**Other:****Ore minerals:** Gold, scheelite**Gangue minerals:****Geologic description:**

Nelson Gulch was placer mined during and possibly after WW II; both gold and scheelite were recovered. An attempt to mine the gulch for scheelite during World War II was reportedly unsuccessful, but Coats (1944) thought that the area between Nelson Gulch and Rocky Mountain Creek had potential for significant scheelite deposits; he identified a scheelite-bearing quartz vein in the headwaters of Nelson Gulch (NM081). Bedrock in the Rocky Mountain Creek drainage is a metasedimentary schist and marble sequence (Hummel, 1962 [MF 248]).

Alteration:**Age of mineralization:**

Holocene.

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:

The gulch was explored and mined on a small scale during World War II and possibly after.

Production notes:

Reserves:

Additional comments:

References:

Coats, 1944; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Coats, 1944

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Hobson Creek**Site type:** Mine**ARDF no.:** NM084**Latitude:** 64.7499**Quadrangle:** NM D-1**Longitude:** 165.2786**Location description and accuracy:**

Hobson Creek is a west tributary to Nome River that enters Nome River about 1 mile above Willow Creek. It joins Manila Creek at the Miocene Ditch crossing in the Nome C-1 quadrangle and is auriferous from about the Miocene Ditch upstream for more than a mile to at least Wet Gulch, an eastern headwater tributary of Hobson Creek. The location used here is at the border between the C-1 and D-1 quadrangles. Hobson Creek is locality 111 of Cobb (1972 [MF-463], 1978 [OFR [78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Hobson Creek was prospected in 1900 but little gold was produced by 1908 (Collier and others, 1908, p. 181). The creek was subsequently mined by dredging from at least 1913 to 1916. The fault that hosts the Breen antimony-gold prospect (NM085) likely crosses the upper part of the creek. Bundtzen and others (1994) mapped a linear structure in Wet Gulch, and there are other faults and sheared formational contacts upstream which could have localized lode gold sources in the Hobson Creek drainage. Bedrock in the Hobson Creek drainage is a metasedimentary schist and marble sequence (Hummel, 1962 [MF 248]; Bundtzen and others, 1994).

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:**

Small-scale mechanical placer mining for gold took place after 1908. In 1913, a 2.5-cubic-foot dredge was moved onto the creek by Arctic Gold Dredging Company. The creek was considered to be rather steep for dredging (Chapin, 1914, p. 387, 390). The dredging difficulties must have been solved to some extent because the dredge was still in operation by the same company in 1916 (Mertie, 1918 [B 662-I, p. 452]).

Production notes:

The creek was productive at least from 1913 to 1916.

Reserves:**Additional comments:**

Fairly extensive placer mining on Hobson Creek suggests that the headwaters may contain undiscovered lode gold deposits, possibly continuations of the Breen East lodes (NM085).

References:

Collier and others, 1908; Chapin, 1914 (B 592-L); Mertie, 1918 (B 662-I); Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Breen East (Hobson)**Site type:** Prospect**ARDF no.:** NM085**Latitude:** 64.7658**Quadrangle:** NM D-1**Longitude:** 165.2959**Location description and accuracy:**

The Breen East prospect includes two patented claims, Hobson Gold Lode and the adjacent Great American Lode. These are in the south-central part of section 26, T. 8 S., R. 33 W., Kateel River Meridian. The claims are on the top of the ridge that separates Hobson Creek from upper Manila Creek. Discovery trenches in the northeast part of the Hobson Gold Lode are about at an elevation of 1,600 feet. The location given is near the center end line that separates the two claims; it is within about 500 feet of the coordinates. The location of the discovery cuts on the Hobson Gold Lode claim is about at the site of locality 27 of Hummel (1962, MF-248), who, followed by Cobb (1972 [MF 463], 1978 [OFR 78-93]), appears to have mislocated the Breen East prospect.

Commodities:**Main:** Au (?)**Other:** Sb (?)**Ore minerals:** Arsenopyrite (?), gold, pyrite, pyrrhotite (?), stibnite (?)**Gangue minerals:** Quartz (?)**Geologic description:**

The Breen East prospect includes two claims patented in 1924, the Hobson Gold Lode and the adjacent Great American Lode. Hummel reported this to be an iron sulfide occurrence that may include arsenopyrite, pyrite, and, in some cases, pyrrhotite. The claims are immediately to the east of the northeastmost Sliscovich group of patented claims (NM086). The Breen East claims lie along a steep northeast-trending fault mapped by Hummel (1962, location 27 [MF 248]). Bundtzen and others (1994) show the same northeast-trending fault as a lineament that passes northerly into a fault. The country rock is interlayered calcareous schist, quartz-muscovite schist, and lesser amounts of marble, schistose marble and black quartz schist. Part of the area is underlain by a metagranodiorite (Hummel, 1962 [MF 248]) that approximately corresponds to a muscovite-bearing felsic metavolcanic schist mapped by Bundtzen and others (1994).

Alteration:

Age of mineralization:**Deposit model:**

Sulfide-bearing quartz veins (?) in metasedimentary rocks.

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

Production Status: None

Site Status: Active?

Workings/exploration:

Workings at the time of the patent application included six shafts, six surface cuts, and two discovery locations. The two claims were patented in 1924; there has been no recent exploration.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Sliscovich**Site type:** Mine**ARDF no.:** NM086**Latitude:** 64.7602**Quadrangle:** NM D-1**Longitude:** 165.3119**Location description and accuracy:**

The Sliscovich claims extend north-northeast for about 1.5 miles from the gentle ridge between Cold and Manila Creeks into the head of Manila Creek. From southwest to northeast the claims are the Greater Alaska, My Best Lode, Sliscovich Discovery, Nasradin and Distin claims (two wide), and Discovery and Manilla Extension Lodes (two wide). The claims correspond generally with localities 15 and 16 of Hummel (1962 [MF 248]). The location used here is approximately the end line between Sliscovich Discovery and Distin lode claims (U.S. Mineral Survey No. 1380). The location is accurate to 0.1 mile of the coordinates. It is locality 28 of Cobb (1972 [MF 46], 1978 [OFR 78-93]).

Commodities:**Main:** Au, Sb**Other:** Ag, As**Ore minerals:** Arsenopyrite, gold, pyrite, stibnite**Gangue minerals:** Albite, ankerite, quartz**Geologic description:**

At least two distinctive types of mineral deposits occur on the Sliscovich claim block. A vein, probably continuous with mineralization at the Breen East prospect (NM085), strikes about east-west and appears to trend onto the southwest part of the My Best Lode claim, where it was opened by adits and trenches. Farther southwest, stibnite-bearing veins near a contact between metasedimentary schist and marble are subparallel to the alignment of the Sliscovich Discovery claim, and stibnite float is found at or below this contact for the length of the claim. Workings in the northeast part of the Sliscovich Discovery claim are, at least in part, on the contact of metasedimentary schist underlying marble (D. Simpson, Bear Creek Mining Company, written communication, 1984).

The contact zone on the Sliscovich Discovery claim was probably developed when the property was visited by Chapin in 1913 (Chapin, 1914, p. 403-404). Chapin described the occurrence as a quartz-stibnite vein that strikes N 60 E and dips 45 degrees northwest. Stibnite was mostly on the footwall, but it also occurred as veins and nests in quartz (Cathcart, 1922). Gouge and slickensides were locally present on both footwall and hang-

ing wall (Mertie, 1918 [B 662-I, p. 425-449]). The vein was developed by a 315-foot adit, a drift on the lode, and an incline from the drift. A 70-foot-long part of the lode was mined for antimony in 1915 from the incline workings. In general, the vein that remained was only a few inches wide, but Cathcart (1922, p. 230) found one section about 45 inches thick that consisted of 13 inches of stibnite and 32 inches of opaque quartz. The vein was similar to that at the Hed & [and] Strand mine (NM070) with most of the quartz on the hanging wall. Massive stibnite-quartz float occurs on the My Best Lode claim and appears to be from the same vein developed on the Breen West claims (NM087). Cathcart (1922) reported some steeply dipping quartz veinlets with northeast strike.

A small ore shipment reported by Chapin (1914) contained about 35 percent antimony; gold and silver were present, but their values were not reported. An 88-ton ore shipment in 1915 returned most of its value in gold (Mertie, 1918). Gold values obtained by Bear Creek Mining locally exceeded 1 ounce per ton. Gamble and others (1985, p. 28) reported that antimony-rich samples contained 4.4 to 6.5 ppm gold, 2 to 7 ppm silver, and 100 to 250 ppm arsenic.

The Sliscovich mine is in metasedimentary schist near an overlying marble. A granitic orthogneiss is mapped upslope to the north (Hummel, 1962 [MF 248]). The metamorphic rocks are part of the Nome Group, which is derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997). The antimony-gold deposits are probably of about the same age.

Alteration:

Chapin (1914, p. 404) reported that the footwall was strongly bleached for about 15 inches and converted to quartz and sericite with fine-grained white pyrite (arsenopyrite?). The hanging wall was silicified. D. Simpson (Bear Creek Mining Company, written communication, 1984) found that the footwall schist was sheared, and altered and carried small amounts of arsenopyrite.

Age of mineralization:

Mid-Cretaceous?; controlled by structures that post-date regional metamorphism; may be same age as some lode gold deposits of Seward Peninsula.

Deposit model:

Simple Sb deposits and low sulfide, Au-quartz vein? (Cox and Singer, 1986; models 27a and 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
27d?, 36a?

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

The claims of the Sliscovich group were located between June 20, 1907, and January 1, 1917, and were patented to James F. Halpin in 1924. According to Chapin (1914, p. 403-404), at least one claim was located as early as 1905. The Sliscovich Discovery claim was developed by 315-foot adit and an incline driven 100 feet along the vein. Stibnite was mined from a 70-foot-long stope. These workings were driven in 1915 or before. The My Best Lode claim also has mine workings. The area was explored by Mapco in about 1981-82. The Sliscovich claims were mapped during Bear Creek Mining's option of the Breen claims (D. Simpson, written communication, 1984). Subsequently the area was studied by BHP (Ford, 1993 [thesis]). The area is within an extensive east-west, gold and arsenic soil anomaly identified by BHP.

Production notes:

A small ore shipment reported by Chapin (1914) contained about 35 percent antimony; gold and silver were present, but their values were not reported. An 88-ton ore shipment in 1915 returned most of its value in gold (Mertie, 1918 [B 662-I, p. 425-449]). Gold values obtained by Bear Creek Mining locally exceeded 1 ounce per ton. Gamble and others (1985, p. 28) reported that antimony-rich samples contained 4.4 to 6.5 ppm gold, 2 to 7 ppm silver, and 100 to 250 ppm arsenic.

Reserves:

Additional comments:

References:

Chapin, 1914 (B 592-L); Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Gamble and others, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Chapin, 1914

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Breen West (Bison)**Site type:** Mine**ARDF no.:** NM087**Latitude:** 64.7577**Quadrangle:** NM D-1**Longitude:** 165.3336**Location description and accuracy:**

The Breen West mine is on the Bison Lode claim, which was patented in 1924. It is at an elevation of about 800 to 1,000 feet on the southwest-facing slope of the ridge between Cold and Manila Creeks and accessible by foot or ATV from a trail which starts in Steep Creek. It is about one-half mile southeast of an unnamed occurrence (NM088) that was mistakenly called Breen West by Hummel (1962 [MF 248]). The Breen West mine is about 1,000 feet west of the vein outcrops on the My Best Lode claim (U.S. Mineral Survey No. 1380) of the Sliscovich mine (NM086). This location is within 500 feet of the surface workings, heavy quartz-stibnite float, and the main discovery cuts on the Bison Lode claim (U.S. Mineral Survey No. 1391). This is locality 1 of Hummel (1962 [MF 248]) and locality 27 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) who apparently mistakenly identified it as Breen East.

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Arsenopyrite, gold, stibnite**Gangue minerals:** Calcite, quartz**Geologic description:**

The Breen West deposit, as exposed on the Bison Lode claim, includes quartz-stibnite veins with some calcite in metasedimentary schist. The quartz-stibnite veins are like those at the adjacent Sliscovich mine (NM086). The metasedimentary schist host rock to the quartz-stibnite veins is also mineralized. A thin zone of metasedimentary schist (calc-schist, quartz-mica schist, and schistose marble) separates feldspathic schist or orthogneiss from underlying massive marble (D. Simpson, Bear Creek Mining Company, written communication, 1984). The lower 5 to 30 feet of the metasedimentary schist zone is sheared and brecciated. Geologic studies and open-hole rotary drilling carried out by Mapco in 1982 and 1983 suggested that mineralization could be stratabound in the metasedimentary schist. Mapco drilled a total of 32 open-hole rotary holes and defined an area of about 200 feet by 600 feet that contained stibnite and about 0.2 ounce of gold per

ton (Stevens, 1991). Bear Creek Mining Company took over the property in 1984 and drilled four core holes that totaled 1,423 feet in length. The drilling appeared to confirm low-grade mineralization, about 0.01-0.03 ounce of gold per ton, in the metasedimentary schist. This drilling did not confirm Mapco's best intercept of 0.125 ounces of gold per ton between 155 and 173 feet in drill hole MD-DH-3. A Bear Creek Mining core hole twinned MD-DH-3 but found only 0.024 ounce of gold per ton gold over 25 feet in the same interval. D. Simpson (Bear Creek Mining Company, written communication, 1984) concluded that high grade gold-stibnite mineralization was localized along east-west-trending, high-angle structures, but that there was also epigenetic psuedo-stratabound mineralization in the metasedimentary schist. Arsenopyrite appeared to be characteristic constituent of the sheared, gold-bearing schist.

In a detailed soil geochemistry program, Bear Creek Mining found as much as 3,300 ppb gold, 7,300 ppm antimony and greater than 1,000 ppm arsenic in soils over the Breen West mine. High-grade samples from semi-massive stibnite veins contained as much as 2.85 ounces of gold per ton. The vein targets, although of very high grade and as much as 4 feet thick, were not of interest to Bear Creek Mining, who returned the property to its owners. The surface workings on the Breen West mine are the probable source of 14 tons of ore that were produced in about 1920. Reportedly, only gold was paid for, although the ore contained about 10 percent antimony (Anderson, 1947).

The Breen West mine is in metasedimentary schist between a marble-rich section and an overlying feldspathic unit mapped as a granodioritic sill or orthogneiss by Hummel (1962 [MF248]). It appears to be within the massive marble unit as mapped by Bundtzen and others (1994); in this area, Hummel's mapping seems to more correctly represent the geology. Subsequent workers have mapped the feldspathic unit as chlorite-feldspar schist and have proposed that it is an intermediate volcanic unit (D. Simpson, Bear Creek Mining Company, written communication, 1984).

The metamorphic rocks are part of the Nome Group, which was derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold-antimony mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Disseminated arsenopyrite in sheared metasedimentary schist.

Age of mineralization:

Mid-Cretaceous?; controlled by structures that post-date regional metamorphism; may be same age as some lode gold deposits of Seward Peninsula.

Deposit model:

Disseminated, gold-bearing sulfide mineralization in calcareous metasedimentary schist; simple Sb deposits; low sulfide, Au-quartz vein? (Cox and Singer, 1986; model 27d and 36a).

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

27d?, 36a?

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

A lode was found at the nearby Sliscovich claim by 1905. Discoveries were subsequently made on the nearby Bison and Haymaker claims that were patented to Henry P. Breen in 1924. The area was probably actively prospected in World War II for strategic minerals. Some work on the Breen claims was done by GCO Minerals in 1968 and 1969. Extensive work was begun by Mapco in 1981; in 1982 and 1983 Mapco drilled 32 open-hole rotary drill holes on a stratabound target in metasedimentary schist. Bear Creek Mining Company optioned the property in 1984 and conducted geologic mapping, geochemical sampling, and a 4-hole core drill program.

They concluded that there was weak pseudo-stratabound mineralization, but that high-grade stibnite-gold veins were steeply dipping and cross-cut the metamorphic structure. BHP Minerals conducted geologic, geochemical, and geophysical studies, including a DIGHEM airborne survey, between 1988 and 1990 in the area. They found a very large gold and antimony anomaly in soils and also confirmed a possible high-grade vein trend in the Breen and Sliscovich areas. BHP pulled out in 1991. Kennecott Exploration Company conducted regional studies in 1995, including re-examination of the Breen and Sliscovich lodes (NM084, NM085, NM086).

Production notes:

The surface workings on the Breen West mine are the probable source of 14 tons of ore that were produced in about 1920. Reportedly only gold was paid for, although the ore contained about 10 percent antimony (Anderson, 1947).

Reserves:**Additional comments:**

Most of the area is controlled by Bering Straits Regional Native Corporation.

References:

Anderson, 1947; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Stevens, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Du-

mitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Stevens, 1991; this report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (in upper Cold Creek)

Site type: Occurrence

ARDF no.: NM088

Latitude: 64.7617

Quadrangle: NM D-1

Longitude: 165.3491

Location description and accuracy:

An unnamed antimony prospect is in Cold Creek about one-half mile north of the east-west trail that connects the Steep Creek and Manila Creek areas. It is 1.2 miles southeast of Mount Distin. This location was called the Breen (West) mine by Hummel (locality 2, 1962 [MF 248]). This is locality 26 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) who, following Hummel (locality 2, 1962 [MF 248]), also identified it as Breen (West). The location is uncertain, but probably within about 1,000 feet of the coordinates.

Commodities:

Main: Au

Other: Sb

Ore minerals: Gold, stibnite

Gangue minerals: Calcite, quartz

Geologic description:

This locality was identified as an antimony occurrence by Hummel (1962 [MF 248]). The vein geology and production formerly ascribed to this occurrence by Cobb (locality 26; 1972 [MF463]; 1978 [OFR 78-93]) probably belong to the Bison Lode patented by Henry P. Breen, which is about a half mile southeast of this occurrence (Breen West, NM087). Stibnite is, however, assumed to be present at this location, probably in quartz veins and with some gold values. This occurrence may be similar to quartz-stibnite veins at the Breen West (NM087) and Sliscovich (NM086) mines to the east. The stibnite occurrence is in a marble-rich metasedimentary sequence (Hummel, 1962 [MF 248]; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Mid-Cretaceous?; may be same age as some lode gold deposits of Seward Peninsula.

Deposit model:

Simple Sb deposits and low sulfide, Au-quartz vein? (Cox and Singer, 1986; models 27d and 36a).

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

27d?, 36a?

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Some antimony claims in the vicinity, including the Hed & [and] Strand (NM070) and the Sliscovich (NM086), were located prior to and during World War I, when the region was actively prospected for antimony.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (in Grouse Creek)**Site type:** Occurrence**ARDF no.:** NM089**Latitude:** 64.7654**Quadrangle:** NM D-1**Longitude:** 165.3586**Location description and accuracy:**

This occurrence is along Grouse Creek, 0.8 mile southeast of Mount Distin, at an elevation of about 400 feet. It is locality 28 of Hummel (1962 [MF 248]) and locality 24 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu**Other:****Ore minerals:****Gangue minerals:****Geologic description:**

Hummel (1962 [MF248]) identified this locality as an occurrence of copper-bearing float. The nature of the copper-bearing material is not known.

Alteration:**Age of mineralization:****Deposit model:**

Surface float of copper-bearing material.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive**Workings/exploration:**

The general area has been prospected and explored many times during the last century.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nelson**Site type:** Prospect**ARDF no.:** NM090**Latitude:** 64.7622**Quadrangle:** NM D-1**Longitude:** 165.3888**Location description and accuracy:**

The Nelson prospect is in Steep Creek, a tributary of Gold Bottom Creek, at an elevation of about 1,050 feet. It is about 0.7 mile south-southwest of Mount Distin. The prospect is locality 13 of Hummel (1962 [MF 248]), locality 23 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); it is shown on figure 17 of Cathcart (1922).

Commodities:**Main:** Pb, Zn**Other:****Ore minerals:** Galena, pyrite, sphalerite**Gangue minerals:** Calcite**Geologic description:**

The Nelson zinc-lead prospect contains sphalerite, galena, and pyrite in veinlets subparallel to layering in marble and in stockwork-like fracture zones; it includes a galena veinlet 2 inches thick (Mertie, 1918 [B 662-I, P. 425-449]; Cathcart, 1922). When the prospect was visited by Cathcart in 1920, mineralization was exposed over about a 6-foot width in an open cut near a contact of marble and mica schist; the schist had a strike of N 15 W and dipped 18 degrees west. The marble was bleached in the mineralized zone. An adit, reportedly 55-feet long (Mertie, 1918 [B 662-I, p. 425-449]), was caved and inaccessible to Cathcart (1922). The prospect was visited in 1995 by C.C. Hawley, but the exposures were badly sloughed and the nature of the mineralization could not be observed. The Nelson prospect is within the main marble mass of Mount Distin where thin mica schist layers occur (Hummel, 1962 [MF 248]; Bundtzen and others, 1994). Layering in the marble and the schist is generally north-dipping and the prospect is about one-half mile south of the east-west axis of the Mount Distin syncline of Hummel (1962 [MF 248]).

Alteration:

Marble was bleached at the prospect.

Age of mineralization:

Probably mid-Cretaceous or younger; appears to postdate regional metamorphism of mid-Cretaceous age.

Deposit model:

Carbonate-hosted, lead-zinc deposit.

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

Production Status: Undetermined

Site Status: Inactive

Workings/exploration:

Developments included a 55-foot adit, an open cut, and several pits; all are now badly sloughed. The site does not appear to have been active since before 1920. Hummel and Chapman (1960) did not find anomalous zinc in stream sediment samples collected from Steep Creek about a mile below the Nelson prospect.

Production notes:**Reserves:****Additional comments:**

The Nelson prospect is on Bering Straits Native Corporation selected lands.

References:

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel and Chapman, 1960; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Tanner**Site type:** Prospect**ARDF no.:** NM091**Latitude:** 64.7590**Quadrangle:** NM D-1**Longitude:** 165.3849**Location description and accuracy:**

The Tanner prospect is in the canyon of Steep Creek, a tributary to Goldbottom Creek; it is at an elevation of about 650 feet, 0.9 mile south of Mount Distin. It is about 4,500 feet north-northeast of the junction of the road up Goldbottom Creek and a jeep trail that leads to this prospect and the McDuffee prospect (NM092). The Tanner prospect is locality 18 of Hummel (1962 [MF 248]) and is included with locality 23 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Gold, stibnite**Gangue minerals:** Ankerite (?), calcite, mica (pale green)**Geologic description:**

The Tanner prospect is in the sheared contact zone between massive marble and underlying mica schist. Schistosity strikes east-west and dips 20 to 40 degrees to the north. The marble is locally stained yellow-brown and may contain some secondary ankerite or dolomite. A pale-green mica, possibly chrome-bearing, occurs in the ankeritic (?) zone. Boudins of stibnite occur in schistose marble within a few feet of the overlying massive marble. The maximum thickness reported for the stibnite masses was 6 inches (Anderson, 1947, p. 4). Stibnite-bearing material was hand picked, and specimens as much as 5 inches across are stockpiled at the site. It is not known if any material was shipped. Native gold can be panned from the stibnite-bearing zone.

The contact zone between schist and marble is exposed along Steep Creek. Immediately above the mineralized contact zone, a near-vertical, east-northeast-striking fault, downthrown to the north, contains crystalline calcite nearly 1-foot thick. Another fault with calcite veins is exposed in the Steep Creek canyon about 400 feet upstream from the Tanner prospect. The calcite veins are parallel to the gold-bearing quartz vein of the McDuffee prospect (NM092) about 500 feet downstream from the Tanner prospect.

Kennecott Exploration Company drilled a reverse-circulation hole into the marble-

schist contact zone near the Tanner prospect in 1995. The drill hole intersected a mineralized interval about 50 feet thick near the base of the marble. The 50-foot zone contained more than 0.05 ounce of gold per ton and a had a maximum 5-foot intercept of greater than 0.10 ounce of gold per ton.

The marble at the Tanner prospect is probably in the younger part of the Nome Group, which has Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold-antimony mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Development of ankerite (?) and pale-green mica .

Age of mineralization:

Probably mid-Cretaceous or younger; appears to postdate regional metamorphism of mid-Cretaceous age.

Deposit model:

Massive stibnite lenses and disseminated gold-bearing mineralization in calcareous schist below marble.

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

Production Status: Undetermined

Site Status: Inactive

Workings/exploration:

Prospecting prior to 1947 identified an essentially stratabound zone that contains native gold and stibnite in the basal schistose zone of a massive marble unit. Subsequently prospectors found and probably mined small quantities of native gold from this zone. In 1995, Kennecott Exploration Company drilled one reverse-circulation hole into the schist-marble contact zone to test it near crosscutting faults that contain calcite veins in marble. The contact zone was appreciably mineralized for about 50 feet, with a maximum 5-foot intercept of more than 0.10 ounce of gold per ton.

Production notes:

Stibnite was mined and stockpiled at the site. Small amounts of gold have been pro-

duced at the site from the schistose zone and from adjacent alluvium.

Reserves:

Additional comments:

The site has been selected by Bering Straits Native Corporation of Nome.

References:

Anderson, 1947; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): McDuffee; McDuffie**Site type:** Mine**ARDF no.:** NM092**Latitude:** 64.7577**Quadrangle:** NM D-1**Longitude:** 165.3824**Location description and accuracy:**

The McDuffee mine is on the east side of Steep Creek between elevations of about 600 and 900 feet; it is 1 mile south of Mount Distin. Vein float can be found above mine workings to an elevation of about 1,000 feet. The mine is about 4,000 feet north-northeast of the intersection of the road along Goldbottom Canyon and a jeep trail that gives access to the mine. The McDuffee is several hundred feet south of the Tanner prospect (NM091). The prospect described here as McDuffee was shown as MacDuffee (East) and MacDuffee (West), localities 10 and 11, by Hummel (1962 [MF 248]). It was included with locality 23 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag, Sb (?)**Ore minerals:** Gold, pyrite**Gangue minerals:** Quartz**Geologic description:**

The McDuffee mine was developed by shafts, adits, and open cuts on gold-bearing quartz veins along faults that cut the host rock schistosity at a high angle. The veins are best developed in a metabasite sill in mica schist that underlies massive marble (Hummel, 1962 [MF 248]; Bundtzen and others, 1994); it is uncertain whether the veins extend into the overlying marble. The McDuffee is a composite vein; the southernmost and strongest part of the vein system strikes northeast and is nearly vertical. It occupies a fault which cuts off the metabasite and faults it against mica schist to the south. The vertical displacement on the fault is probably more than 100 feet, the south side displaced down, if a metabasite sill in Steep Creek below the mine is the same as the one in the mine. In general the vein is narrow. In underground workings, it appears to be 1 to 3 feet across and is largely stoped out. At a point near the lower adit, a second vein splits from the main vein structure. This vein strikes about east-west and is near vertical. The vein (fault) displaces the upper contact of metabasite about 10 to 20 feet. Both the main and east-west vein segments appear to be stronger where they have one or both walls in metabasite. Old sur-

face workings developed in the cliff face on the east side of Steep Creek probably mined residual placers on the lodes.

Little is known concerning the productivity of the vein. It is largely stoped out in the upper adit workings, so it is inferred to have been fairly rich. Gamble and others (1985) collected one sample that assayed 120 ppm or nearly 4 ounces of gold per ton; they also collected another sample that contained 4 ppm gold. Oxygen isotope data on the vein samples collected by Gamble and others (1985) are consistent with a metamorphic origin of the vein-forming fluids.

In about 1990, BHP geologists defined a nearly east-west belt of anomalous gold and antimony in soils that includes the area of the McDuffee mine and the nearby Tanner prospect (NM091). In general, the anomalous soils coincide most closely with the main contact of mica schist and overlying marble exposed in Steep Creek; locally, anomalous values could reflect high-grade vein zones. One of the compilers (C.C. Hawley) worked in this region in 1995 for Kennecott Exploration Company and mapped the area at 1 inch to 1,000 feet, with some mapping near the prospects at 1 inch to 50 feet.

The metamorphic rocks at the McDuffie mine are part of the Nome Group, derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Age of mineralization:

Probably mid-Cretaceous; controlled by structures that postdate regional metamorphism; probably similar in age to some other lode gold deposits of Seward Peninsula.

Deposit model:

Low sulfide, Au-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 McDuffee vein is developed principally by two adits at elevations of about 730 and

780 feet. These adits develop the northeast-striking part of the vein. The vein splits near the lower adit; a north branch trends about due west downslope and is developed by a shallow shaft and, where it transects metabasite, by surface workings. The southerly branch trends downhill about west-southwest and is developed by surface workings where its north wall is formed by the metabasite. There are probably several hundred feet of underground workings.

The vein was apparently unknown when the area was visited by Cathcart in 1920 (Cathcart, 1922), although he shows the Nelson lead-zinc prospect in upper Steep Creek and studied the Hed & [and] Strand, Breen, and Sliscovich antimony workings at that time. The workings were certainly in place when the area was mapped by Hummel (1962 [MF 248]). The area was investigated by BHP in about 1990 and by Kennecott Exploration Company in 1995.

Production notes:

A small amount of gold is assumed to have been mined and milled.

Reserves:**Additional comments:**

The area is in the regional selections of the Bering Straits Native Corporation.

References:

Cathcart, 1922; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Gamble and others, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Steep Creek

Site type: Mine

ARDF no.: NM093

Latitude: 64.7506

Quadrangle: NM D-1

Longitude: 165.3890

Location description and accuracy:

Steep Creek flows south from Mount Distin. Placer gold mining occurred on Steep Creek for about 0.75 mile upstream from its confluence with Goldbottom Creek (in the Nome C-1 quadrangle). The location used here is 1.5 miles south of Mount Distin. This is locality 85 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold, magnetite

Gangue minerals:

Geologic description:

The gravels of Steep Creek were placer mined for gold over a distance of about 0.75 mile upstream of its confluence with Goldbottom Creek. Much of this mining was before 1905. The paystreak was 60 to 70 feet wide in coarse gravels 1.5 to 4 feet thick, and the concentrates contained magnetite (Moffit, 1913). Gold-bearing lode deposits are present along Steep Creek above the placer workings (see NM091 and NM092).

Alteration:

Age of mineralization:

Holocene.

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 took place along the lower 0.75 miles of Steep Creek, probably before 1905.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Silver Creek**Site type:** Mine**ARDF no.:** NM094**Latitude:** 64.7500**Quadrangle:** NM D-1**Longitude:** 165.3967**Location description and accuracy:**

Silver Creek, a north tributary of Steep Creek (NM093), flows south from the southwest flank of Mount Distin. The stream has been placer mined by mechanical methods for about 1,500 feet above its confluence with Steep Creek.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The lower 1,500 feet of Silver Creek has been placer mined by small-scale mechanical methods; this mining probably occurred in the 1930's and 1940's. The creek flows across interlayered marble, mica schist, and probably some metabasite for about a mile above its confluence with Steep Creek. The uppermost 2,000 feet of the drainage (above the mined section) is in massive marble (Hummel, 1962 [MF 248]; Bundtzen and others, 1994).

Proximal sources for the placer gold may exist in the Silver Creek drainage. Soils developed on the basal contact of the massive marble in upper Silver Creek are highly anomalous in gold and arsenic (see NM096). In the summer of 1995, Kennecott Exploration Company mapped the Silver Creek drainage and excavated more than 1,000 feet of trenches east and west of Silver Creek in a search for the source of the arsenic and gold anomaly in soils. The source was not clearly identified, although gold-bearing hematitic zones, possibly overlying veins, were found west of Silver Creek. It is also possible that the McDuffee vein structure (NM092) exposed in Steep Creek extends southwesterly into the Silver Creek area.

Alteration:**Age of mineralization:**

Holocene.

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: Probably inactive

Workings/exploration:

Small-scale mechanical mining of placer gold probably took place in 1930's and 1940's.
The area has been explored in the 1990s for lode gold deposits.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Goldbottom Creek**Site type:** Mine**ARDF no.:** NM095**Latitude:** 64.7503**Quadrangle:** NM D-1**Longitude:** 165.4252**Location description and accuracy:**

Goldbottom Creek is the main drainage on the southwest side of Mount Distin. It has been placer mined for gold upstream from its confluence with Steep Creek and into section 31, T. 8 S., R 33 W., Kateel River Meridian. Goldbottom Creek, including Steep Creek, is locality 85 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Sn**Ore minerals:** Cassiterite, gold**Gangue minerals:****Geologic description:**

Goldbottom Creek was placer mined for gold at least as early as 1900 (Brooks and others, 1901). Moffit (1913, p. 87) reported that hand mining and a small hydraulic plant operated in the upper part of the creek in 1905. Moffit (1913) also reported stream tin (cassiterite) at several places in the creek. Goldbottom Creek was later worked by small-scale mechanical methods. Mining perhaps was in conjunction with small-scale mechanical mining on Silver Creek (NM094) and Steep Creek (NM093). Silver Creek and Steep Creek, also Grouse Creek (NM099), are eastern tributaries of Goldbottom Creek. Production on Goldbottom Creek is unknown, but was fairly small. Some small-scale mining and prospecting have been carried out in recent years.

Goldbottom Creek drains the basal contact of the massive marble unit mapped by Hummel (1962 [MF 248]) and Bundtzen and others (1994). One of the compilers (C.C. Hawley) mapped this section of Goldbottom Creek at 1 inch to 1,000 feet in 1995 and identified several possible structures that could source gold above the head of placer pay. About 1,000 feet above the head of the placer deposit, Goldbottom Creek enters a canyon, and flood-plain gravels are too thin and narrow to be exploited except on a very small scale. Approximately 6,000 feet above the placer, the creek crosses the lower contact of massive marble and is in this unit for about 2,000 feet. In this reach of the canyon, the marble is highly dolomitized and cut by small quartz veinlets. The marble is in a syncli-

nal structure, and the basal contact is cut again by Goldbottom Creek in its northern headwaters. About 3000 feet above the upper basal marble contact, Goldbottom Creek crosses part of the Penny River fault system that hosts the California prospect (NM062). The possible sources of placer gold in Goldbottom Creek include the complexly veined dolomite unit, the sheared basal contact zone of massive marble, and veins associated with the Penny River fault system. Moffit (1913) reported granitic boulders in Goldbottom Creek gravels, so some gold may have been derived from reworking of glacial deposits derived from the Kigluaik Mountains.

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: Active?

Workings/exploration:

Hand and small-scale mechanical placer mining started as early as 1900 and may still be active on Goldbottom Creek.

Production notes:**Reserves:****Additional comments:**

See also Silver Creek (NM094), Steep Creek (NM093) and Grouse Creek (NM099).

References:

Brooks and others, 1901; Moffit, 1913; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Silver Creek--lode)**Site type:** Prospect**ARDF no.:** NM096**Latitude:** 64.7613**Quadrangle:** NM D-1**Longitude:** 165.4049**Location description and accuracy:**

This prospect is in the drainage of Silver Creek, a northeast tributary to Goldbottom Creek. It is about 1 mile southwest of Mount Distin. A sulfide-bearing, northeast-trending vein zone is located at an elevation of 900 feet in the NW1/4 section 32, T. 8 S., R. 33 W., Kateel River Meridian.

Commodities:**Main:** As, Au, Sb**Other:****Ore minerals:** Arsenopyrite, gold (?), pyrite, stibnite**Gangue minerals:** Ankerite, quartz**Geologic description:**

This prospect is located near the west end of a large area of anomalous gold and arsenic values in soils defined by BHP-Utah International, Inc. (Stevens, 1991). Near Silver Creek, gold in soils locally exceeds 100 ppb and arsenic exceeds 800 ppm. Kennecott Exploration explored the area in 1995 by detailed surface mapping and with 1,000 feet of trenches. The trenches are on the west side of Silver Creek and extend from the Snake River road northward almost to the contact between massive marble and underlying metasedimentary schist (Bundzten and others, 1994). The source of the anomalous gold and arsenic in soils was not clearly identified, although a sulfide-bearing, northeast-trending vein zone is located at an elevation of 900 feet in the NW 1/4, section 32 (T. 8 S., R. 33 W., Kateel River Meridian). The sources of the anomalous metals could include stratabound quartz-stibnite-gold mineralization in schist near the base of massive marble, as at the nearby Tanner prospect (NM091), or low sulfide, gold-quartz veins, as at the nearby McDuffee mine (NM092). Silver Creek contained a small gold placer (NM094) below this prospect.

Alteration:

Disseminated sulfides (?), silicification (?), ankerite replacement (?).

Age of mineralization:

Mid-Cretaceous?; appears to postdate regional metamorphism.

Deposit model:

Massive stibnite lenses and disseminated gold-bearing mineralization in calcareous schist below marble and/or low-sulfide, Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a ?

Production Status: None**Site Status:** Probably inactive**Workings/exploration:**

BHP-Utah International, Inc. completed surface mapping and a large soil geochemistry survey in the general area in 1989-90. The soil geochemistry survey defined an area of anomalous gold and arsenic values about 4 miles long. This prospect is in the western part of the anomalous area. Kennecott Exploration Company explored the prospect in 1995 by detailed surface mapping and 1,000 feet of trenches. The trenches are on the west side of Silver Creek and extend from the Snake River road northward almost to the contact between massive marble and underlying metasedimentary schist.

Production notes:**Reserves:****Additional comments:****References:**

Stevens, 1991; Bundtzen and others, 1994.

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Dorothy Creek**Site type:** Mine**ARDF no.:** NM097**Latitude:** 64.8237**Quadrangle:** NM D-1**Longitude:** 165.2347**Location description and accuracy:**

Dorothy Creek is a west tributary to upper Nome River. The mouth of Dorothy Creek is about 1.4 miles downstream from the mouth of Divide Creek, another west tributary to Nome River. Dorothy Creek may have been placer mined for gold over most of its lower 1.3 miles. This is locality 105 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Sb, W**Ore minerals:** Gold, scheelite, stibnite**Gangue minerals:****Geologic description:**

Dorothy Creek was placer mined for gold as early as 1900, and by 1903 about 44,000 dollars or 2,125 ounces of gold had been produced (Collier and others, 1908). Some mining took place as recently as 1940 (Smith, 1942). The placer concentrate contained bladed stibnite crystals and minor scheelite (Coats, 1944; Anderson, 1947).

Bedrock in the Dorothy Creek drainage is mainly metasedimentary schist that lies structurally above a regionally extensive marble unit (Hummel, 1962 [MF 248]). Small orthogneiss bodies, greenstone bodies, and numerous quartz veins are present in the schist (Collier and others, 1908; Hummel, 1962 [MF 248]). The Wyoming prospect (NM110) is apparently an arsenopyrite- and (or) pyrite-bearing vein exposed along Dorothy Creek, and antimony occurrences (NM068, NM069) and the Bulk Gold prospects (NM071, NM072) occur on the ridge along the southwest headwaters of Dorothy Creek.

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: Active?

Workings/exploration:

Dorothy Creek was placer mined as early as 1900 and by 1903 about 44,000 dollars or 2,125 ounces of gold had been produced (Collier and others, 1908). Some mining took place as recently as 1940 (Smith, 1942).

Production notes:

The produced gold reportedly assayed 14 to 15 dollars per ounce (Collier and others, 1908). The early mining was said to have been expensive and little profit was made (Moffit, 1913).

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Smith, 1942; Coats, 1944; Anderson, 1947; Hummel, 1962 (MF 248).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Manila Creek**Site type:** Mine**ARDF no.:** NM098**Latitude:** 64.7450**Quadrangle:** NM C-1**Longitude:** 165.2874**Location description and accuracy:**

Manila Creek joins Hobson Creek to flow into the west side of Nome River in the Nome C-1 quadrangle. The location used here is the approximate center of the placer mined section which is mostly in the Nome C-1 quadrangle. This is locality 110 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Sb (?)**Ore minerals:** Gold, stibnite (?)**Gangue minerals:****Geologic description:**

Chapin (1914, p. 389) reported a rich placer gold discovery on Manila Creek. The paystreak, about 10 feet thick, was on schist bedrock below about 25 feet of barren alluvium. The gold was reported to be coarse and flaky. In 1916, Mertie (1918, p. 454) found two underground drift mines in operation on Manila Creek. The headwaters of Manila Creek are in a highly mineralized area that includes several identified antimony and gold deposits (NM085, NM086, and NM087).

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:

Small-scale drift mines operated on this creek at least up to 1916.

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1914 (B 592-L); Mertie, 1918 (B 662-I); Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Grouse Creek**Site type:** Mine**ARDF no.:** NM099**Latitude:** 64.7503**Quadrangle:** NM D-1**Longitude:** 165.3615**Location description and accuracy:**

Grouse Creek is a small, south-flowing stream on the southeast side of Mount Distin. It is a north tributary to Goldbottom Creek; its confluence with Goldbottom Creek is in the Nome C-1 quadrangle. The creek is auriferous about 1 mile above its mouth (Collier and others, 1908, p. 197-198) and upstream near its confluence with Cold Creek, which is on the Nome C-1 quadrangle (NM100). This is locality 86 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, hematite**Gangue minerals:****Geologic description:**

Small-scale placer mining for gold took place as early as 1903 on Grouse Creek (Collier and others, 1908). This early mining was about 1 mile upstream from its confluence with Goldbottom Creek. The pay along this part of the creek was 1 to 3 feet thick and 40 feet wide. The gold was bright and rough, with nuggets as much as 2 pennyweights. Concentrates at this locality were mostly hematite pebbles. Near the mouth of Cold Creek (in the Nome C-1 quadrangle), an east tributary to Grouse Creek, gravels averaged about 5 feet deep, and the gold occurred in the gravel and in crevices in marble bedrock (Moffit, 1913, p. 88). This mined area is near a contact between marble and metasedimentary schist.

Hummel (locality 28, 1962 [MF-248]) reported copper-bearing minerals in float in upper Grouse Creek (NM089) and copper in the form of tetrahedrite was reported in a quartz vein from the Grouse Creek drainage (Anderson, 1947, p. 11). The headwaters of Grouse Creek are in the area of an extensive gold and arsenic soil anomaly reported by BHP (written communication, 1995).

The headwaters of Grouse Creek cross massive marble with intercalated metasedimentary schist (Hummel, 1962 [MF 248]; Bundtzen and others, 1994). Lower Grouse Creek is in pelitic schist, local graphitic quartz schist, and a sill-like body of orthogneiss (C.C.

Hawley, written communication, 1999).

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:

Grouse Creek was prospected and mined at least as early as 1903. It carried a considerable flow of water and was active during some dry years when other creeks were inactive. Mining was on a small scale and mostly hand operations.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Anderson, 1947; Hummel, 1962 (MF 248); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Cold Creek

Site type: Mine

ARDF no.: NM100

Latitude: 64.7500

Quadrangle: NM D-1

Longitude: 165.3503

Location description and accuracy:

Cold Creek is an east tributary to Grouse Creek, itself a tributary to Goldbottom Creek. At the south boundary of the Nome D-1 quadrangle, Cold Creek is about 0.4 mile east of Grouse Creek and about 1 mile west of Manila Creek. Placer mining for gold has taken place at several localities along Cold Creek including the location used here (field examination by C.C. Hawley, 1995).

Commodities:

Main: Au

Other: Sb (?)

Ore minerals: Gold, stibnite (?)

Gangue minerals:

Geologic description:

Cold Creek has been placer mined for gold by small-scale mechanical or hand methods at several places. Possible lode sources of gold and stibnite in the Cold Creek drainage are the Breen West mine (NM087) and an unnamed antimony-gold (?) occurrence (NM088). The Cold Creek drainage has a geologic setting similar to that of nearby Grouse Creek (NM099).

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: Probably inactive

Workings/exploration:

Hand or small-scale mechanical placer workings occur at several places along this creek at some unknown time (field examination by C.C. Hawley, 1995).

Production notes:

Reserves:

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Nome River**Site type:** Mines**ARDF no.:** NM101**Latitude:** 64.6463**Quadrangle:** NM C-1**Longitude:** 165.2841**Location description and accuracy:**

Nome River is auriferous downstream from its confluence with Buffalo Creek, an east headwater tributary (Nome D-1 quadrangle), to the mouth of the river east of Nome (on Nome B-1 quadrangle). The location shown is the approximate mid-point of the auriferous deposit on the Nome C-1 quadrangle. The total length of the auriferous section is about 26 miles. Close to the mouth of Nome River, alluvial deposits merge with beach-type gold deposits to form a very complex series of placer gold deposits.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Nome River floodplain is gold-bearing downstream from its confluence with Buffalo Creek (Nome D-1 quadrangle) to the mouth of Nome Creek (Nome B-1 quadrangle) (Collier and others, 1908, plate X). Almost certainly some placer gold was mined from the Nome River with rockers and pans on transient gold deposits on river bars in the early days of the district. In later years, large-scale mechanical placer mining occurred in Nome River flood plain at the mouth of Sparkle Creek, also at the mouth of Dexter Creek (both on the Nome C-1 quadrangle) (Bundtzen and others, 1994, sheet 1).

Gold-bearing tributaries to upper Nome River on the D-1 quadrangle include Boer Creek (NM049), Divide Creek (NM057), Dorothy Creek (NM057), Christian Creek (NM073), and Rocky Mountain Creek (NM082). On the C-1 quadrangle, gold-bearing tributaries include Basin (NM301), Sparkle (NM302), Dexter (NM303), Buster (NM304), and Osborn Creeks (NM305).

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: Undetermined

Site Status: Inactive

Workings/exploration:

Small-scale placer mining by rocker or pan almost certainly occurred in the early years of the 20th century on river bar deposits of Nome River. Parts of the Nome River flood plain near the mouths of auriferous tributaries were mined mechanically in later years. These flood-plain operations include those near the mouths of Sparkle and Dexter Creeks and below the mouth of Nil Desperandum Gulch on the right limit (west side) of Nome River.

On the basis of the distribution of patented placer claims, Nome River was explored systematically and covered by patented claims from just above Sparkle Creek to about McDonald Creek, which is the approximate location of the so-called 'Third-Beach' deposits.

Production notes:

Production from Nome River may have been reported with that of its gold-bearing tributaries, such as Dexter Creek.

Reserves:

Unknown, but the floodplain between Sparkle and McDonald Creeks is a gold resource.

Additional comments:**References:**

Collier and others, 1908; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Champion Ditch**Site type:** Occurrence**ARDF no.:** NM102**Latitude:** 64.8552**Quadrangle:** NM D-1**Longitude:** 165.2714**Location description and accuracy:**

Campion Ditch starts on Hudson Creek and crosses Divide Creek (NM057) about 2.2 miles to the south of its origin. This location is not well constrained and could be one or more localities along the ditch between Hudson and Divide Creeks.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

Moffit (1913) reported that quartz fragments with attached gold were found during construction of the Champion Ditch. One quartz fragment with attached gold weighed 0.75 pound and appears to have been recovered near the point where the ditch crosses Divide Creek (NM057). However, there is the possibility that gold-bearing quartz fragments were found elsewhere along the Champion Ditch north of Divide Creek. This part of the ditch borders the east side of a large auriferous area in which the Divide and Divide Hill lode gold prospects (NM058 and NM118) are located.

Alteration:**Age of mineralization:**

Probably mid-Cretaceous.

Deposit model:

Possibly low sulfide, Au-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: Probably inactive

Workings/exploration:

Some exploration accompanied construction of Campion Ditch from 1903 to 1905. In the 1990,s, exploration took place on the ridge crest upslope to the west of the Campion Ditch.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed; Head of LaSpray Creek; southwest of the head of Nelson Gulch (NM083)

Site type: Occurrence

ARDF no.: NM103

Latitude: 64.7600

Quadrangle: NM D-1

Longitude: 165.1718

Location description and accuracy:

The occurrence is at an elevation of about 1,500 feet and about 0.25 mile southwest of hill 1710 in the SW1/4SW 1/4 section 28, T. 8 S., R. 32 W., Kateel River Meridian. It is in the extreme headwaters of LaSpray Creek, a creek mostly on the Nome C-1 quadrangle. It is locality 21 of Hummel (1962 [MF 248]) and is located to within about 500 feet of the coordinates.

Commodities:

Main: Au (?)

Other:

Ore minerals: Arsenopyrite, pyrite, pyrrhotite (?)

Gangue minerals:

Geologic description:

This is an occurrence of arsenopyrite and (or) pyrite near the upper contact of a layer of marble and overlying schist; the rocks strike about north-northwest and dip generally to the east (Hummel, 1962 [MF 248]). The deposit may be marked by an prospect old cut or trench; it may be stratabound or in veinlets. It was listed by Hummel (1975) as an unevaluated mineral occurrence.

Alteration:

Age of mineralization:

Deposit model:

Arsenopyrite and (or) pyrite associated with a schist-marble contact.

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

Production Status: None

Site Status: Inactive

Workings/exploration:
Prospect pit or cut.

Production notes:

Reserves:

Additional comments:

References:
Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (at the head of Fox Creek)**Site type:** Occurrence**ARDF no.:** NM104**Latitude:** 64.7735**Quadrangle:** NM D-1**Longitude:** 165.1522**Location description and accuracy:**

The occurrence is on the north side of a ridge between upper Fox Creek and Bock Creek at an elevation of about 1,600 feet. It is about on the east half of the section line that separates sections 21 and 28, T. 8 S., R. 32 W., Kateel River Meridian. The site is locality 22 of Hummel (1962 [MF 248]) and locality 23 of Hummel (1975).

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Arsenopyrite, pyrite, pyrrhotite (?)**Gangue minerals:****Geologic description:**

Arsenopyrite, pyrite, and (or) possibly pyrrhotite occur in a old pit or cut at this locality (Hummel, 1962 [MF 248]). The occurrence is in interlayered marble and calcareous mica schist. Hummel (1975) cited the location as an unevaluated mineral occurrence.

Alteration:**Age of mineralization:****Deposit model:**

Arsenopyrite, pyrite, or pyrrhotite associated with schist and marble.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive**Workings/exploration:**

A prospect pit or cut is apparently present here.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (upper Bock Creek)

Site type: Occurrence

ARDF no.: NM105

Latitude: 64.7814

Quadrangle: NM D-1

Longitude: 165.1348

Location description and accuracy:

The occurrence is in a minor unnamed gulch on the west side of the south-facing ridge between the upper forks of Bock Creek, a headwater tributary to Fox Creek. It is at an elevation of about 1,000 feet and its location is known within about 1,000 feet of the coordinates. It is locality 22 of Hummel (1975).

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals: Carbonate, quartz

Geologic description:

Hummel (1975) identified this occurrence as stratabound, metallized, and silicified marble; other information was not provided. The occurrence is near a steep fault that strikes northwest (Hummel, 1962 [MF 248]).

Alteration:

Silica-rich rocks in marble, silicification?

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:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (south fork of Ahlfield Creek)

Site type: Occurrence

ARDF no.: NM106

Latitude: 64.8111

Quadrangle: NM D-1

Longitude: 165.1520

Location description and accuracy:

Ahlfield Creek is a southeast tributary to Sulphur Creek, an east tributary to upper Nome River. This occurrence is 1.7 miles east of the Nome-Taylor road and at a elevation of 1,150 along the south fork of Ahlfield Creek. It is locality 51 of Hummel (1975), and its location is known to within about 1,000 feet.

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals:

Geologic description:

Hummel (1975) identified this location as a mineral occurrence, but other information was not provided. The occurrence is in metasedimentary rocks that include dolomitized marble (Hummel, 1962 [MF 248]).

Alteration:

Dolomitization?

Age of mineralization:

Deposit model:

Mineral occurrence in carbonate rocks.

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:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (near Ahlfield Creek)

Site type: Occurrence

ARDF no.: NM107

Latitude: 64.8045

Quadrangle: NM D-1

Longitude: 165.1669

Location description and accuracy:

This occurrence is on a plateau on the ridge between Ahlfield and Christian Creeks at an elevation of 1,350 feet. Ahlfield Creek is a southeast tributary to Sulphur Creek. Both Sulphur and Christian Creeks are east tributaries to upper Nome River. It is 1.2 miles east of the Nome-Taylor road. This is locality 52 of Hummel (1975).

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals:

Geologic description:

Hummel (1975) identified this location as a mineral occurrence but gave no other information. The occurrence is in metasedimentary rocks that include dolomitized marble (Hummel, 1962 [MF 248]). It is in the hanging wall of a faulted, down-dropped schist section; the fault appears to control the course of lower Ahlfield Creek.

Alteration:

Dolomitization?

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:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Humel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (on ridge between Ahlfield and Christian Creeks)

Site type: Occurrence

ARDF no.: NM108

Latitude: 64.8080

Quadrangle: NM D-1

Longitude: 165.1828

Location description and accuracy:

This occurrence is on the ridge between Ahlfield and Christian Creeks, at an elevation of 1,150 feet. Ahlfield Creek is a southeast tributary to Sulphur Creek. Both Sulphur and Christian Creeks are east tributaries to upper Nome River. The occurrence is 0.8 miles east of the Nome-Taylor road. This is locality 53 of Hummel (1975).

Commodities:

Main:

Other:

Ore minerals:

Gangue minerals:

Geologic description:

Hummel (1975) identified this locality as an occurrence of altered rocks containing sulfide or other ore minerals; other information was not provided. It is within calcareous metasedimentary rocks (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Deposit model:

Altered rocks with sulfide or other ore minerals.

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:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Little Gulch**Site type:** Occurrence**ARDF no.:** NM109**Latitude:** 64.8098**Quadrangle:** NM D-1**Longitude:** 165.2279**Location description and accuracy:**

The occurrence is in Little Gulch, a small west tributary to upper Nome River, whose mouth is opposite the mouth of Sulphur Creek. The occurrence is located where the Mio-cene Ditch crosses Little Gluch, 0.4 mile west of the Nome-Taylor road. This is locality 54 of Hummel (1975).

Commodities:**Main:****Other:****Ore minerals:****Gangue minerals:****Geologic description:**

Hummel (1975) identified this occurrence as a mineralized vein or fault and noted that metallization was confirmed by assay or other chemical analysis, but no other information was given. Host rocks in this area are calcareous metasedimentary rocks (Hummel, 1962 [MF 248]).

Alteration:**Age of mineralization:****Deposit model:**

Vein in calcareous metasedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive

Workings/exploration:

Small prospecting pits may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1975

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Wyoming**Site type:** Occurrence**ARDF no.:** NM110**Latitude:** 64.8180**Quadrangle:** NM D-1**Longitude:** 165.2466**Location description and accuracy:**

The Wyoming vein crops out in Dorothy Creek (NM097) above the confluence with Short Creek, a west tributary. It is at an elevation of about 700 feet. This is locality 20 of Hummel (1962 [MF 248]) and locality 58 of Hummel (1975).

Commodities:**Main:** Au (?)**Other:** As**Ore minerals:** Arsenopyrite, pyrite, pyrrhotite (?)**Gangue minerals:** Quartz**Geologic description:**

Hummel (1962 [MF 248]) reported arsenopyrite, pyrite, and possibly pyrrhotite at this locality. Dorothy Creek (NM097) is auriferous, and Collier and others (1908) noted numerous quartz veins in schist bedrock of the drainage. The Wyoming prospect is apparently an arsenopyrite- and (or) pyrite-bearing vein. Antimony occurrences (NM068 and NM069) and the Bulk Gold prospects (NM071 and NM072) occur on the ridge along the southwest headwaters of Dorothy Creek. Bladed stibnite crystals were common in placer concentrates recovered from Dorothy Creek (Anderson, 1947).

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; postdates regional metamorphism.

Deposit model:

Arsenopyrite- and (or) pyrite-bearing vein in metamorphic rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None

Site Status: Probably inactive

Workings/exploration:

Prospect pits.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Anderson, 1947; Hummel, 1962 (MF 248); Hummel, 1975.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Quartz Creek (Stewart River)**Site type:** Occurrence**ARDF no.:** NM111**Latitude:** 64.8359**Quadrangle:** NM D-1**Longitude:** 165.3049**Location description and accuracy:**

The headwaters of Quartz Creek, a tributary of Stewart River, are across a low divide south from Boer Creek (NM049). Quartz Creek flows south and joins Thompson Creek to form the head of Stewart River. A low divide to the east of Quartz Creek separates the upper Stewart River drainage from Divide Creek (NM057) and upper Nome River. Quartz Creek is about 1.3 miles long.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Gold (?)**Gangue minerals:****Geologic description:**

Quartz Creek forms the approximate west boundary of the Divide prospect (NM058). The drainage heads into a divide marked by gold-quartz veins that almost certainly fed both Boer Creek to the north and Quartz Creek to the south, although Quartz Creek has not, apparently, been identified as gold-bearing. The ancestral geomorphic relations in this area are uncertain, and Quartz Creek many have once flowed to the Nome River drainage and been headwaters to Divide Creek (NM057). Quartz Creek rises along a contact that separates relatively graphitic and less graphitic metasedimentary rocks (Hummel, 1962 [MF 248]).

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: None**Site Status:** Probably inactive**Workings/exploration:**

Quartz Creek at the head of Stewart River may not have been explored for its placer potential.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 248).

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 10/22/1999

Site name(s): Unnamed (Windy Creek)**Site type:** Occurrence**ARDF no.:** NM112**Latitude:** 64.9547**Quadrangle:** NM D-1**Longitude:** 165.4635**Location description and accuracy:**

This graphite occurrence is on the ridge crest between Windy Creek and an unnamed east tributary to the Cobblestone River. It is at 2,400 feet elevation and about 500 feet south of saddle 2345. It is locality 36 of Hummel (1962 [MF 248]).

Commodities:**Main:** Graphite**Other:****Ore minerals:** Graphite**Gangue minerals:** Biotite, feldspar, garnet, quartz, sillimanite**Geologic description:**

This is one of three graphite occurrences (this occurrence, NM023, and NM113) mapped by Hummel (1962 [MF 248]) in this part of the Kigluaik Mountains. At NM023, graphite with biotite is disseminated in schist and also occurs in segregations to 18 inches thick. It also occurs as sparse disseminations in pegmatite. Moffit (1913, p. 135-136) described a graphite-rich layer 8 inches thick between pegmatite and schist walls. This occurrence probably also includes disseminations and segregations of graphite in the host schist.

The graphite-bearing rocks are upper amphibolite facies schist and gneiss that are probably derived from Precambrian protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of

the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Age of mineralization:

Mid-Cretaceous; the age of high-grade metamorphism.

Deposit model:

Graphite disseminations and segregations in amphibolite facies metamorphic rocks.

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:

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Cobblestone River)**Site type:** Occurrence**ARDF no.:** NM113**Latitude:** 64.9807**Quadrangle:** NM D-1**Longitude:** 165.4639**Location description and accuracy:**

This occurrence is near an unnamed west-flowing tributary to the upper Cobblestone River. It is near the center of section 24, T. 6 S., R. 34 W., Kateel River Meridian. It is on a minor ridge at about 1,400 feet elevation. The occurrence is locality 38 of Hummel (1962 [MF 248]).

Commodities:**Main:** Graphite**Other:****Ore minerals:** Graphite**Gangue minerals:** Biotite, feldspar, garnet, quartz, sillimanite**Geologic description:**

This is one of three graphite occurrences (this occurrence, NM023, and NM112) mapped by Hummel (1962 [MF 248]) in this part of the Kigluaik Mountains. At NM023, graphite with biotite is disseminated in schist and in segregations to 18 inches thick. It also occurs as sparse disseminations in pegmatite. Moffit (1913, p. 135-136) described a graphite-rich layer 8 inches thick between pegmatite and schist walls. This occurrence is probably also disseminations and segregations of graphite in schist.

The graphite-bearing rocks are upper amphibolite facies schist and gneiss that are probably derived from Precambrian protoliths (Sainsbury, 1972; Bunker and others, 1979; Till and Dumoulin, 1994). They are thought to have undergone regional high-pressure metamorphism along with many other rocks of Seward Peninsula in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Patrick, 1988; Patrick and Evans, 1989; Armstrong and others, 1986; Hannula and McWilliams, 1995). Higher temperature metamorphism overprinted these rocks in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Throckmorton and Hummel, 1979; Till, 1983; Evans and Patrick, 1987; Leiberman, 1988; Patrick and Leiberman, 1988; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson and Arth, 1983; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Uplift of

the higher temperature metamorphic rocks took place in the mid- to Late Cretaceous and in the Eocene (Calvert, 1992; Dumitru and others, 1995).

Alteration:

Age of mineralization:

Mid-Cretaceous, the age of high-grade metamorphism.

Deposit model:

Graphite disseminations and segregations in amphibolite facies metamorphic rocks.

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:

Moffit, 1913; Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, 1972; Bunker and others, 1979; Till, 1980; Till, 1983; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Evans and Patrick, 1987; Leiberman, 1988; Patrick, 1988; Patrick and Leiberman, 1988; Patrick and Evans, 1989; Miller and Hudson, 1991; Miller and others, 1992; Calvert, 1992; Hudson, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (lode in Rocky Mountain Creek)

Site type: Occurrence

ARDF no.: NM114

Latitude: 64.7770

Quadrangle: NM D-1

Longitude: 165.1877

Location description and accuracy:

The occurrence is in Rocky Mountain Creek about 0.2 mile below the stibnite vein called the Lindfors prospect (NM080); it is at an elevation of about 550 feet. The location is shown on figure 4 of Coats (1944). The location is accurate within about 500 feet.

Commodities:

Main: W

Other: Au?

Ore minerals: Gold (?), scheelite

Gangue minerals: Quartz, feldspar

Geologic description:

Rocky Mountain Creek has been mined for gold, and concentrates contain scheelite (NM082). The creek was one of six creeks on the Seward Peninsula that have been identified as possibly containing important amounts of scheelite (Coats, 1944, p. 6). This prospect is on a linear feature mapped from aerial photographs by Hummel (1962 [MF 248]). The linear appears to closely coincide with the scheelite-bearing vein and scheelite-bearing float that was traced from Rocky Mountain Creek southerly for 4,000 feet to Nelson Gulch (Coats, 1944, figure 4). Bedrock in this area is a calcareous schist that gradationally overlies quartzite and schist (Hummel, 1962 [MF 248]).

Alteration:

Age of mineralization:

Deposit model:

Scheelite-bearing quartz-plagioclase veins in schist.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Explored by placer mining on Rocky Mountain Creek.

Production notes:

Possibly some placer production of scheelite from Rocky Mountain Creek.

Reserves:

Additional comments:

References:

Coats, 1944; Hummel, 1962 (MF 248).

Primary reference: Coats, 1944

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Dickens Creek**Site type:** Occurrence**ARDF no.:** NM115**Latitude:** 64.8660**Quadrangle:** NM D-1**Longitude:** 165.2096**Location description and accuracy:**

This occurrence is at 1,100 feet elevation in the headwaters of Dickens Creek, a east tributary to upper Nome River (Cathcart, 1922, fig. 15). It is 0.4 mile south of the Copper Mountain prospect (NM054).

Commodities:**Main:** Cu, Pb (?)**Other:** Ag (?), Au (?)**Ore minerals:** Azurite, bornite, chalcopyrite, galena, malachite, pyrite**Gangue minerals:** Calcite, mica, quartz**Geologic description:**

This is a copper occurrence that may be similar to other copper prospects in the area such as Copper Mountain (NM054), Copper King (NM051), and Copper Creek (NM053) that contain copper carbonate and copper sulfide-bearing, silica-rich zones in metacarbonate rocks. Country rocks at this locality are interlayered pelitic schist and marble (Thurston, 1985, figure 3A).

The location is shown in figure 15 of Cathcart (1922) due south of locally named Copper Mountain. Country rock was mapped as chloritic, feldspathic, and graphitic schist containing many limestone units. The area appears to have been first visited by Smith (1908, p. 240-242), then by Moffit (1913, p. 134-135).

Alteration:**Age of mineralization:**

Late Proterozoic, early Paleozoic, or Cretaceous.

Deposit model:

Carbonate-hosted, sulfide-bearing silica-rich rock (?).

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Prospect pits.

Production notes:

Reserves:

Additional comments:

References:

Smith, 1908; Moffit, 1913; Cathcart, 1922; Thurston, 1985.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Unnamed (Short Creek)**Site type:** Occurrence**ARDF no.:** NM116**Latitude:** 64.8439**Quadrangle:** NM D-1**Longitude:** 165.4012**Location description and accuracy:**

This occurrence is on the ridge crest at the head of Short Creek, a north tributary to upper Stewart River. It is at an elevation of 2,100 feet and is locality 41 of Hummel (1962 [MF 248]).

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Arsenopyrite, pyrite, pyrrhotite**Gangue minerals:****Geologic description:**

Hummel (1962 [MF 248]) identified this as an iron sulfide occurrence with arsenopyrite, pyrite, and possibly pyrrhotite. It may be in crosscutting veins or disseminated in the amphibolite facies, biotite-bearing metasedimentary bedrock (Bundzten and others, 1994). It is not known if other sulfide minerals are present.

Alteration:**Age of mineralization:****Deposit model:**

Arsenopyrite, pyrite, and possibly pyrrhotite in veins or disseminated in amphibolite facies metasedimentary rocks.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive

Workings/exploration:

Possibly some surface propecting as part of the regional exploration in the area.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Bundtzen and others, 1994.

Primary reference: Hummel, 1962 (MF 248)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Bonanza Creek**Site type:** Mine**ARDF no.:** NM117**Latitude:** 64.8806**Quadrangle:** NM D-1**Longitude:** 165.0163**Location description and accuracy:**

Bonanza Creek is a west tributary to Jasper Creek, which flows north to Salmon Lake near the east-central boundary of the Nome D-1 quadrangle. This occurrence is on the lower part of Bonanza Creek between about 500 and 950 feet elevation. The site is plotted at an elevation of 700 feet, the approximate midpoint of the auriferous placer shown by Smith (1909, plate X).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Smith (1909, plate X) showed this part of Bonanza Creek to be an auriferous placer deposit, but subsequent reports have not mentioned it.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined**Site Status:** Inactive

Workings/exploration:

The occurrence of placer gold on Bonaza Creek is only known from Smith's early report on the Iron Creek region (1909, plate X).

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1909.

Primary reference: Smith, 1909

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Divide Hill**Site type:** Prospect**ARDF no.:** NM118**Latitude:** 64.8567**Quadrangle:** NM D-1**Longitude:** 165.2859**Location description and accuracy:**

The Divide Hill prospect, developed by Cominco American in 1995 and 1996, is the northeast extension of the Divide prospect (NM058). Divide Hill is the north-trending ridge between Boer Creek and Nome River. Its crest is shown as elevation 1546 feet. The prospect is mostly in the E1/2NE 1/4 section 26, T. 7 S., R. 33 W., Kateel River Meridian. The location is the approximate center of four drill hole locations; it is accurate to within 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, gold, pyrite**Gangue minerals:** Albite, quartz**Geologic description:**

The Divide Hill prospect is part of a large auriferous area that includes Boer Creek (NM049) and the Divide prospect (NM058). The prospect at Divide Hill was explored by four drill holes (Div-10, -11, -12, -13), all in the E1/2NE 1/4 section 26, T. 7 S., R. 33 W. Significant gold-bearing intercepts were found in holes Div-10 and -12. Hole Div-10 had 25 feet of 0.028 ounce of gold per ton and hole Div-12 contained 52 feet of 0.092 ounce of gold per ton. This appears to be the best drill hole in the Divide-Divide Hill area (Cominco American, written communication, August 22, 1996). The Divide Hill area does not appear to have been trenched.

On the basis of descriptions of mineralization at the Divide prospect (NM058) to the south, mineralization here is expected to be gold-bearing, quartz veins along steeply dipping joints and fractures. The veins have albite and local silicified selvages, and larger veins have several feet of selvage with ankerite. In general, pyritization appears to be a favorable indication of nearby gold mineralization. In decreasing order of abundance, the ore minerals in the veins are pyrite, arsenopyrite, pyrrhotite, galena, stibnite, sphalerite, and jamesonite.

The host rocks at the Divide Hill prospect are metasedimentary rocks of retrograde

greenschist or lower amphibolite facies, including graphitic and calcareous schist, blue-gray, gray, and black marble, and black quartz schist and quartzite (Hummel, 1962 [MF 248]). Hummel (1962 [MF 248]) mapped less graphitic rocks west and northwest of Quartz Gulch, including most of the canyon of Boer Creek. Projection of mapped bed-rock geology from the west suggests that some of these metamorphic rocks could be biotite-bearing (Sainsbury, Hummel, and Hudson, 1972; Bundzten and others, 1994). The schistose rocks are mostly phyllonites with slip schistosity approximately parallel to lithologic contacts and original bedding. Schistosity strikes northeast to east-northeast and dips about 30 degrees southeast.

The metamorphic rocks here are probably part of the Nome Group derived from Proterozoic to early Paleozoic protoliths (Till and Dumoulin, 1994). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury, Coleman, and Kachadoorian, 1970; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist facies or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is related to the higher temperature metamorphism in the mid-Cretaceous (Apodoca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Alteration:

Local silicification and more pervasive introduction of pyrite and ankerite in the vicinity of vein systems.

Age of mineralization:

Mid-Cretaceous; postdates regional metamorphism and is probably similar in age to other lode gold deposits of Seward Peninsula.

Deposit model:

Low sulfide, Au-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:**

Four reverse circulation holes were drilled in 1996 in conjunction with the Cominco American evaluation of the general area between Divide Creek (NM057) and Boer Creek (NM049), both long recognized as placer gold sources in the north Nome River area.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 248); Sainsbury, Coleman, and Kachadoorian, 1970; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Till and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Till and Dumoulin, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 10/22/1999

Site name(s): Boulder Creek**Site type:** Mine**ARDF no.:** NM119**Latitude:** 64.6952**Quadrangle:** NM C-3**Longitude:** 166.0003**Location description and accuracy:**

The headwaters of Boulder Creek are in the Nome C-3 quadrangle; about 3.5 miles long, it flows southeasterly into Sinuk River in the Nome C-2 quadrangle. A placer gold deposit extends for about 2 miles along the creek. The location is the approximate mid-point of the auriferous section about at the boundary of the C-2 and C-3 quadrangles. This is locality 60 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

There is no specific information on this placer deposit. Collier and others (1908, p. 216-217) reported mining in 1902-03. Later claim activity was reported by Heiner and Porter (1972, Kardex site Kx 52-90) and active claims were reported as recently as 1981-82 (Alaska Division Geological and Geophysical Surveys, 1982). Bedrock in the Boulder Creek drainage is chloritic and graphitic schist (Sainsbury and others, 1972 [OFR 72-322]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes

Site Status: Undetermined

Workings/exploration:

A placer deposit in Boulder Creek was discovered early in the history of the Nome district and was mined in 1902-03 (Collier and others, 1908). Claim activity was reported in 1929; claims may have been patented as U.S. Mineral Survey No. 841 (Heiner and Porter, 1972, Karex site Kx 52-90). Further claim activity was reported as recently as 1981-82 (Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-322); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Sinuk River**Site type:** Mines**ARDF no.:** NM120**Latitude:** 64.7011**Quadrangle:** NM C-2**Longitude:** 165.9458**Location description and accuracy:**

Collier and others (1908, plate X) identified a gold-bearing area about 3 miles long in the upper part of Sinuk River centered approximately, between Green Gulch (NM127) and Independence Creek (NM126) southwest of the Nome-Teller road. The east limit of the area is approximately Washington Creek (NM128). The coordinate location is the approximate center of the gold-bearing area shown by Collier and others (1908). It is an approximate location.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

As indicated by mining claim locations (Kardex site Kx 52-308; Alaska Division of Geological and Geophysical Surveys, 1982), exploitation of the gold-bearing high-level gravels in this area was considered in the early days of the district and possibly as recently as 1982 on claims near 'Irish Hill' (hill 1335 south of Green Gulch). Collier and others (1908, p. 216) reported 'good prospects' in this area, including one 2-pennyweight (0.1 ounce) nugget found several hundred feet above Sinuk River. High-level gold-bearing gravels were reworked to form small economic placer deposits at Rulby Creek (NM016) and Green Gulch (NM127). A possible Tertiary source for some alluvial gold was reported at Coal Creek (NM129), an unnamed creek just north of the Nome-Teller road. Boulders of metamorphic and plutonic rocks from the Kigluaik Mountains are reported in the high-level gravels. Exploitation has in general been precluded by the cost of water delivery to these high-level gravel prospects.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

The upper Sinuk River region was recognized as gold bearing as early as 1900. Both Boulder Creek (NM119) and Independence Creek (MN126) were worked on a small scale before 1903. Some claim activity south of Green Gulch was reported as recently as 1982 (Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:

Reserves:

A possible gold resource exists in high-level gravels of the area.

Additional comments:

References:

Collier and others, 1908; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Quartz Creek (headwaters)**Site type:** Mine**ARDF no.:** NM121**Latitude:** 64.6011**Quadrangle:** NM C-3**Longitude:** 166.0139**Location description and accuracy:**

Quartz Creek flows south to Norton Sound in the southeast corner of the Nome C-3 quadrangle. The locality, reported by Sainsbury and others (1972 [OFR 72-322]), is in upper Quartz Creek about 3 miles above the mouth. The location is accurate to about 1,000 feet. The locality is in the south 1/2 section 23, T. 10 S., R. 37 W., Kateel River Meridian. This is locality 63 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Sainsbury and others (1972 [OFR 72-322]) reported a small area of placer gold mining on upper Quartz Creek. The placer gold was on bedrock, but glacial moraine or outwash has been mapped nearby and upstream of the placer workings. Bedrock in the area is mainly impure marble and calc-schist.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a); possible derivation from reworking of glacial deposits.

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

39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Some small-scale surface workings are present, but little information is available.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury and others, 1972 (OFR 72-322); Cobb, 1978 (OFR 78-93).

Primary reference: Sainsbury and others, 1972 (OFR 72-322)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Quartz Creek (lower)

Site type: Mine

ARDF no.: NM122

Latitude: 64.5740

Quadrangle: NM C-3

Longitude: 166.0160

Location description and accuracy:

Quartz Creek flows south to Norton Sound in the southeast corner of the Nome C-3 quadrangle. An area of placer mining was reported by Collier and others (1908) in lower Quartz Creek about one mile above its mouth. Claim activity was reported as recently as 1953 (Alaska Division of Geological and Geophysical Surveys, 1982). This is locality 62 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Collier and others (1908, p. 215) reported sluicing for gold at this locality in 1903; information on the placer was not reported, but they noted that two men were making little more than wages in 1903'. Bedrock in this area is mainly chloritic schist (Sainsbury and others, 1972 [OFR 72-322]); quartz veinlets were reported to be common (Collier and others, 1908).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Claim activity on Quartz Creek was reported in 1900 (Heiner and Porter, 1972, Kardex site Kx 52-90). Collier and others (1908) reported mining in 1903. Activity on the claims was reported as recently as 1953 (Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-322); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (northwest of the mouth of Quartz Creek)

Site type: Occurrence

ARDF no.: NM123

Latitude: 64.5666

Quadrangle: NM C-3

Longitude: 166.0162

Location description and accuracy:

A vein containing gray copper was reported by Collier and others (1908) on a steep bluff above Norton Sound about one-half mile west of the mouth of Quartz Creek (NM122). The vein is only approximately located, probably within a third of a mile. This occurrence was included as part of locality 63 by Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Cu

Other: Ag, Au

Ore minerals: Tetrahedrite-tennantite

Gangue minerals: Quartz

Geologic description:

A quartz-sulfide (sulfosalt) vein several feet thick was reported by Collier and others (1908, p. 215) to be exposed on the bluffs above Norton Sound a short distance west of Quartz Creek. The vein was concordant to schistosity at a contact between chloritic and graphitic schist layers. Assays reported only trace amounts of gold and silver. The sulfide or sulfosalt mineral is described only as gray copper, most probably tennantite. The vein was lenticular and reportedly 'thinned rapidly' (Collier and others, 1908).

Alteration:

Age of mineralization:

Because the vein is concordant to metamorphic foliation, it could be older than mid-Cretaceous, but a younger age is also possible.

Deposit model:

Quartz-sulfide (sulfosalt) vein in metamorphic rocks.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Prospecting activity occurred in the area shortly after the discovery of gold at Nome in 1898. The vein was discovered about 1903 or earlier.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Sinuk River (lower)**Site type:** Prospect**ARDF no.:** NM124**Latitude:** 64.6335**Quadrangle:** NM C-3**Longitude:** 166.2243**Location description and accuracy:**

A total of 62 mining claims were reported to be present at this location along lower Sinuk River in 1982 (Alaska Division of Geological and Geophysical Surveys, 1982, location 253). The location is shown as on or adjacent to Sinuk River about 4 miles upstream from its mouth on Norton Sound. The location is probably accurate within about 1 mile.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Mining claim activity between 1968 and 1978 was reported along a portion of lower Sinuk River at location 253 about 2 miles below the mouth of Camp Creek and 4 miles upstream from the mouth of Sinuk River on Norton Sound (Alaska Division of Geological and Geophysical Surveys, 1982). Paleozoic marble bedrock is locally exposed along Sinuk River in this area (Sainsbury and others, 1972 [OFR 72-322]). The river reworks a mantle of surficial deposits that lie on bedrock; glacial materials may be present (Sainsbury and others, 1972 [OFR 72-322]). The nature of the placer deposits has not been reported.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Active mining claims were reported along lower Sinuk River in 1968 (Alaska Division of Geological and Geophysical Surveys, 1982, location 253). The same Kardex site number and activity date were reported by Heiner and Porter (1972), but they called the location Cherry Creek. The claims were abandoned in 1978.

Production notes:

Reserves:

Additional comments:

References:

Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-322); Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Alaska Division of Geological and Geophysical Surveys, 1982

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (Norton Sound)**Site type:** Prospect**ARDF no.:** NM125**Latitude:** 64.6049**Quadrangle:** NM C-3**Longitude:** 166.2847**Location description and accuracy:**

Mining claims were reported on the beach about 1.5 miles northwest of the mouth of the Sinuk River (Kardex site Kx 52-293, Heiner and Porter, 1972) . The prospect is probably located within a half mile along the beach.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The coastal plain here is a low marine terrace cut into Paleozoic marble (Sainsbury and others, 1972 [OFR 72-322]). Fluvial or glacio-fluvial deposits of the Sinuk River drainage were reworked by shoreline processes in this area during development of the marine terrace. Two mining claims, apparently on or adjacent to the present beach and 1.5 miles northwest of the mouth of the Sinuk River, were located in 1968 and were active in 1972 (Heiner and Porter, 1972, Kardex site Kx 52-293). It is assumed that the mining claims were located on a placer gold prospect.

Alteration:**Age of mineralization:**

Holocene; active beach placer.

Deposit model:

Beach placer Au.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Undetermined

Site Status: Probably inactive

Workings/exploration:

Mining claims were located in 1968 and held at least through 1972.

Production notes:

Reserves:

Additional comments:

References:

Heiner and Porter, 1972.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Independence Creek**Site type:** Mine**ARDF no.:** NM126**Latitude:** 64.7115**Quadrangle:** NM C-2**Longitude:** 165.9815**Location description and accuracy:**

Independence Creek is a west tributary of Sinuk River; its mouth is 1.5 miles downstream from where the Nome-Teller road crosses Sinuk River. It is locality 4 of Hummel (1975). Cobb (1978 [OFR 78-93]) summarized information for this location under the name 'Independence Ck.'.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Mining claims were staked on Independence Creek in 1900 (Heiner and Porter, 1972, Kardex site Kx 52-88). The creek was visited by Collier and his associates in 1903; there was no activity at that time, but there was considerable evidence of previous placer gold mining and prospecting along the creek (Collier and others, 1908, p. 217). Descriptions of the placer deposits have not been reported. Paleozoic marble bedrock is locally exposed in the drainage (Sainsbury and others, 1972 [OFR 72-321]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

 Mining claims were located in 1900, and some placer gold mining occurred before 1903.

Production notes:

Reserves:

Additional comments:

References:

 Collier and others, 1908; Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-321); Hummel, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Green Gulch; Irish Hill; Washington Creek

Site type: Mine

ARDF no.: NM127

Latitude: 64.6994

Quadrangle: NM C-2

Longitude: 165.9198

Location description and accuracy:

Green Gulch was a productive placer mine within a large area of auriferous gravel southwest of Washington Creek (NM128) just south of the Nome-Teller road and on the southside of the Sinuk River site (NM120). The location given is on Green Gulch, an east tributary to Sinuk River; it marks both the Green Gulch placer mine and a general location for the widespread auriferous bench gravels shown by Collier and others (1908, plate X). Bench gravels were also reported to occur flanking the west side hill 1300 (Irish Hill) of Collier and others (1908, p. 216, plate X) south of Green Gulch. This hill is elevation 1335 of the current U.S. Geological Survey Nome C-2 quadrangle. Apparently there is no active mining now, but the gravel benches may have been staked as the Volkheimer-Williams claims in 1969 (Heiner and Porter, 1972, Kardex site Kx 52-308). Green Gulch is locality 61 of Cobb (1972 [MF 463]); Cobb (1978 [OFR 78-93]) referred to this locality as 'Washington Ck.'.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

An extensive area of auriferous bench gravel was mapped by Collier and others (1908, plate X) west of Washington Creek (NM128) extending south along the west flank of hill 1335. The auriferous area merges with the Sinuk River valley (NM120). Collier and others (1908) reported that good prospects, including recovery of a 0.5-ounce nugget, were found in the bench gravels. Placer gold in Green Gulch could have been reworked from the auriferous bench gravels. Sainsbury and others (1972 [OFR 72-321]) mapped bedrock on hill 1335 as mainly chloritic schist with some marble.

Alteration:

Age of mineralization:

Quaternary; gravels of the active Green Gulch are Holocene.

Deposit model:

Alluvial 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:

The area was known as auriferous by 1903. Some claim activity was reported as recently as 1969 when 23 claims were located (Heiner and Porter, 1972, Kardex site Kx 52-308). Their location is very approximate but appears to be near Irish Hill (hill 1335).

Production notes:

Minor production.

Reserves:

Large areas of low-grade, gold-bearing gravels may be present in the area.

Additional comments:**References:**

Collier and others, 1908; Sainsbury and others, 1972 (OFR 72-321); Cobb, 1972 (MF 463); Heiner and Porter, 1972; Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Washington Creek

Site type: Mine

ARDF no.: NM128

Latitude: 64.7134

Quadrangle: NM C-2

Longitude: 165.9006

Location description and accuracy:

Washington Creek is an east tributary to Sinuk River; its mouth is 0.5 mile downstream from where the Nome-Teller road crosses Sinuk River. Washington Creek forms the approximate east limit of a large, low-grade gold-bearing area on the south side of Sinuk River (NM120) that includes the productive placer at Green Gulch (NM127). This location is about 4,000 feet above the mouth of Washington Creek.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Placer claims were located on Washington Creek, a tributary of the Sinuk River, in 1900 (Heiner and Porter, 1972, Kardex site Kx 52-93). Washington Creek was mentioned by Collier and others (1908, p. 216) as part of an area of auriferous bench gravels. Placer gold in Washington Creek could have been reworked from these bench gravels.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Placer claims were staked on Washington Creek in 1900 (Heiner and Porter, 1972), but the nature of the deposit or related mining is not known.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Heiner and Porter, 1972.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Coal Creek**Site type:** Mine**ARDF no.:** NM129**Latitude:** 64.7358**Quadrangle:** NM C-2**Longitude:** 165.9191**Location description and accuracy:**

Coal Creek is a west tributary to Sinuk River; the mouth of Coal Creek is about three-quarters of a mile upstream from where the Nome-Teller road crosses Sinuk River. Coal Creek is not identified by name on the current U.S. Geological Survey Nome C-2 quadrangle map. The mine is in the south 1/2 section 5, T. 9 S., R. 36 W., Kateel River Meridian. It is located to within about a quarter mile. This is locality 59 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Coal Creek placer gold mine is developed on graphitic schist and coal-bearing Tertiary sedimentary rocks that may be downfaulted against schist. Herreid (1970, figure 1, p. 10) described the Tertiary sedimentary rocks as conglomerate with marble and schist fragments; coal beds are present in these sediments along Coal Creek. Collier and others (1908, p. 84) reported that the coal-bearing strata along Coal Creek had a northwest strike and dipped southwest at about 30 degrees. An adit driven in the west bank of Coal Creek crosscut layers of bituminous coal about 16 inches thick that are separated and floored by fire clay layers. They proposed that the coal basin probably covered about one-half of a square mile.

Placer gold was found in the gravels of Coal Creek as the creek was being prospected for coal (Collier and others, 1908, p. 217). Hydraulic mining was proposed for the creek with water from a source in the Kigluaik Mountains but was apparently never undertaken on a large scale. Some placer gold here may have been derived from reworking of the Tertiary sedimentary rocks.

Alteration:

Age of mineralization:

Quaternary; gold may have been derived by reworking of Tertiary sedimentary rocks.

Deposit model:

Alluvial 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 small-scale surface placer gold workings are present. An adit was used to prospect coal beds in the area.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Galena**Site type:** Prospect**ARDF no.:** NM130**Latitude:** 64.7301**Quadrangle:** NM C-2**Longitude:** 165.8198**Location description and accuracy:**

The Galena prospect is at an elevation of about 800 feet on the ridge crest along the west side of Washington Creek, an east tributary to Sinuk River. It is 1.2 miles northeast of where the Nome-Teller road crosses Washington Creek and about a half mile south of hill 955. This is locality 5 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe, Pb, Zn**Other:** Ag, Au, F**Ore minerals:** Fluorite, galena, hemimorphite, limonite, pyrite, sphalerite**Gangue minerals:** Calcite, dolomite, quartz**Geologic description:**

The Galena prospect was discovered before 1915 (Eakin, 1915 [B 622-I, p. 366-373]). It was visited by Mertie in 1916 (1918 [B 662-I, p. 445]), who reported a total of nine claims and some prospecting work, primarily for iron. Joint-controlled (N 15 W, vertical) galena-quartz mineralization in crystalline limestone was present on the Sunrise claim; disseminated sphalerite with pyrite and lilac-colored fluorite was present on the Oso claim; and disseminated galena with quartz was identified on the Fox and Williams claims. Botryoidal limonite (goethite) was reported from the Kentucky claim. The prospect was also visited by Mulligan and Hess (1965) and Herreid (1966, p. 8-10). Herreid found as much as 5.8 percent zinc adjacent to a silicified zone in marble that was traced for more than 200 feet on a trend of N 10 W; he also found 1.0 percent lead and 0.85 ounce of silver per ton in samples from an old trench. Petrographic descriptions of 15 samples from the Galena prospect were reported by Mulligan and Hess (1965).

The prospect is located within a soil geochemical anomaly more than one-half mile long. The anomaly is subparallel to the contact of the massive marble unit and underlying schist (Herreid, 1970, figure 1). In some cases, for example, Herreid's sample 98, the location is sufficiently removed from the marble to suggest mineralization is present in the underlying schist. Herreid (1970) reported several soil samples containing more than 1,000 ppm zinc and a maximum value of 405 ppm lead; as much as 7 ppm molybdenum

was present in the samples.

Like the Cub Bear prospect nearby (NM133), the Galena prospect appears to have characteristics transitional between the Sinuk-area iron deposits (such as the Monarch prospect, NM017) and the fluorite-barite-zinc-lead deposit at the Quarry prospect (NM135). The Galena prospect is on strike with, and in a similar structural and stratigraphic setting to, the Quarry prospect (NM135) about 2 miles to the southeast.

Alteration:

Possible dolomitization, silicification, and oxidation.

Age of mineralization:

Post mid-Cretaceous, the age of metamorphism of the host schist and marble.

Deposit model:

Iron oxide and some quartz-sulfide veins and replacements in marble and schist.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The prospect was located and explored by shallow shafts, short adits and trenches before 1915 (Eakin, 1915 [B 622-I, p. 366-373]; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). Herreid conducted geologic mapping and soil sampling of the area (1966, 1970). An early report (Mertie, 1918 [B 662-I, p. 425-449]) indicated that considerable gold was present in a galena-quartz vein, but samples collected by Herreid (1966) contained a maximum of 0.02 ounce of gold per ton.

Production notes:

Reserves:

Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that the iron oxide deposits at the Galena prospect include 100 long tons containing 30 to 45 percent iron and 10,000 long tons containing 10 to 20 percent iron.

Additional comments:

The prospect could be explored along the basal contact of the massive marble that overlies schist. Before erosion, there may have been nearly continuous mineralized horizons between the Quarry prospect (NM135) and this deposit.

References:

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Mulligan and Hess, 1965; Herreid, 1966; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Herreid, 1966

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Iron Creek**Site type:** Prospect**ARDF no.:** NM131**Latitude:** 64.7361**Quadrangle:** NM C-2**Longitude:** 165.7405**Location description and accuracy:**

The Iron Creek prospect is on the ridge crest northeast of the head of Ashland Creek, 2.5 miles northeast of the Nome-Teller road. The prospect is at an elevation of about 1,100 feet and near the center of section 6, T. 9 S., R. 35 W., Kateel River Meridian. The location is accurate to within about 500 feet. This is locality 6 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Fe, Mn**Other:** Ti**Ore minerals:** Limonite, pyrolusite (?), rutile**Gangue minerals:** Calcite, dolomite**Geologic description:**

Limonitic rocks occur in a synform near the base of a marble unit (Herreid, 1970, figure 1). According to Mulligan and Hess (1965), samples of outcrop consist of finely crystalline marble with minor disseminated limonite and limonitic cavity fillings; sericitic schist with minor earthy and compacted limonite and accessory rutile is also present. Associated schist consists of chlorite, limonite, quartz, biotite, sericite, manganese oxides (pyrolusite?), and minor clay. There is an estimated resource of 12,000 long tons of material that contains 20 to 40 percent iron and 20,000 long tons of 10 to 20 percent iron (Shallit, 1942; Mulligan and Hess, 1965, table 3). Mulligan and Hess (1965) found no evidence of sulfides at this deposit, and samples collected by Herreid (1970) contained only as much as 220 ppm zinc.

Alteration:**Age of mineralization:**

Post mid-Cretaceous, the age of metamorphism of the host schist and marble.

Deposit model:

Iron oxide veins and replacement of marble and schist.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Some surface prospecting pits are probably present.

Production notes:

Reserves:

Shallit (1942; Mulligan and Hess, 1965, table 3) estimated that there are 12,000 long tons of limonitic material containing 20 to 40 percent iron and 20,000 long tons of limonitic material containing 10 to 20 percent iron.

Additional comments:

References:

Mulligan and Hess, 1965; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Mulligan and Hess, 1965

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed**Site type:** Occurrence**ARDF no.:** NM132**Latitude:** 64.7104**Quadrangle:** NM C-2**Longitude:** 165.7663**Location description and accuracy:**

The occurrence is approximately located about a half mile northwest of the Quarry prospect (NM135) on the west slope of hill 1205; it is about 0.6 mile northeast of the Nome-Teller road at an elevation of about 1,100 feet. This location is Kardex site Kx 52-250 of Heiner and Porter (1972); its accuracy is not known.

Commodities:**Main:** Fe**Other:****Ore minerals:** Hematite (?) or limonite (?)**Gangue minerals:****Geologic description:**

A single claim located for iron was reported in 1927 for Maximoff and G. Victor (Heiner and Porter, 1972). There are no other data on the occurrence. It is inferred to be an iron oxide deposit similar to the Cub Bear prospect (NM133) which is apparently about a half mile east-northeast of this occurrence.

Alteration:**Age of mineralization:**

Probably post mid-Cretaceous, the age of bedrock metamorphism in the area.

Deposit model:

Iron oxide veins and replacement of marble and schist?

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive

Workings/exploration:

One patented claim in 1927 was reported for this location (Heiner and Porter, 1972). Activity at the claim was reported until 1965 (Alaska Division of Geological and Geophysical Surveys, 1982). Surface prospecting pits are probably present.

Production notes:**Reserves:****Additional comments:****References:**

Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Cub Bear**Site type:** Prospect**ARDF no.:** NM133**Latitude:** 64.7114**Quadrangle:** NM C-2**Longitude:** 165.7477**Location description and accuracy:**

The Cub Bear prospect is on the west side of Cripple River, about 4,000 feet northwest of the mouth of Snowshoe Gulch; the prospect is mainly on a steep easterly slope between about 750 and 1,000 feet in elevation in section 18, T. 9 S., R. 35 W., Kateel River Meridian. The location is approximately half-way between two northerly aligned masses of iron minerals (Herreid, 1970; Bundtzen and others, 1994). The prospect is locality 7 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); Cobb's map location (1972 [MF 463]) appears to be about three quarters of a mile north-northeast of the true location.

Commodities:**Main:** Fe, Mn**Other:** Ag, Pb, Zn**Ore minerals:** Galena (?), goethite, hematite, pyrite, pyrolusite (?), sphalerite (?)**Gangue minerals:** Dolomite, quartz, sericite (white mica)**Geologic description:**

The Cub Bear prospect is a ferruginous zone about 3,000 feet long and as much as 200 feet across that strikes north-northwest (Herreid, 1970, figure 6). The prospect contains a mineralized zone near Herreid's samples 1, 2, and 3 that contains anomalous zinc. The main concentration of iron is near Herreid's samples 4, 5, and 6, approximately 1,500 feet north of the zinc-bearing samples. Bedrock exposure is poor at the prospect. According to Herreid (1970, p. 28), the rubble overlying the deposit consists of goethite, dark yellow-brown ferruginous marble, crackled dolomite, medium-grained marble, and fine-grained ferruginous material. Crackled dolomite locally has goethite veinlets, with goethite pseudomorphic after pyrite. Dolomite breccia appears to form a discontinuous envelope around the iron-rich deposit.

The mineralized zone is essentially in marble of the massive marble unit of Bundtzen and others (1994); it occurs along a high-angle fault that separates the massive marble unit to the west from the graphitic schist unit to the east. The mineralized unit is most likely the lowermost massive marble, a unit that Herreid (1970) mapped in thrust contact with underlying mica schist.

The prospect has a small iron resource estimated by Shallit (1942; Mulligan and Hess, 1965, table 3) to be 10,000 long tons with 10 to 20 percent iron and a small tonnage of material containing 30 to 45 percent iron. A sample of goethite collected by Herreid contained 16 percent iron. The prospect also is locally anomalous in zinc. Samples from the south part of the prospect (Herreid's localities 1 to 3) contained as much as 2.4 percent zinc in a 10-foot chip sample. A 100-foot-long sample, collected near Herreid's samples 3 to 6, contained 1,650 ppm zinc. The lead content of these samples did not exceed 67 ppm, and silver content did not exceed 1.3 ppm; no gold was detected.

The iron deposits of the Sinuk River area have generally been interpreted as gossan developed on oxidized sulfide deposits. At the Cub Bear prospect, there is some iron oxide (goethite) pseudomorphic after pyrite, consistent with this mode of origin. Alternatively, the deposits are primarily hypogene iron oxide deposits that are transitional into the carbonate-hosted base metal-fluorite-barite deposits of the area, such as at the Quarry prospect nearby (NM135). The relatively high zinc content of the Cub Bear prospect is consistent with the latter possibility. The age of the deposit is almost certainly post mid-Cretaceous, the age of metamorphism of the host marble. A Late Cretaceous origin was argued for the Quarry prospect by Brobst and others (1971).

Alteration:

Dolomitization peripheral to iron oxide mineralization.

Age of mineralization:

Post mid-Cretaceous, the age of metamorphism of the host schist and marble.

Deposit model:

Iron oxide veins and replacement of marble and schist.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

The Cub Bear prospect was developed by a series of pits and trenches before 1915 (Eakin, 1915 [B 622-I, p. 361-365]). Mertie (1918 [B 662-I, p.446]) reported that no recent work was evident in 1916. Cathcart (1922, p. 261), however, reported exploration by 12 trenches, 20 to 30 feet long and about 3 feet deep. The prospect was visited by Shallit (1942) and Mulligan (Mulligan and Hess, 1965) who estimated resources of iron at the prospect. Herreid (1970, figure 6) prepared a map of the prospect at 1:6000 scale. Herreid also assayed samples for gold, silver, copper, lead, and zinc.

Production notes:**Reserves:**

The prospect has been estimated to contain 100 tons of material with 30 to 45 percent

iron and 10,000 tons with 10 to 20 percent iron (Shallit, 1942). There is some manganese oxide.

Additional comments:

References:

Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1922; Shallit, 1942; Mulligan and Hess, 1965; Herreid, 1970; Brobst and others, 1971; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Iron Creek (lower)**Site type:** Occurrence**ARDF no.:** NM134**Latitude:** 64.7228**Quadrangle:** NM C-2**Longitude:** 165.7285**Location description and accuracy:**

Iron Creek is an informally named, small west tributary to Cripple River that is not shown on the current U.S. Geological Survey topographic map. This occurrence is 2 miles northeast of the Nome-Teller road. The occurrence, called the Lower Iron Creek gossan by Herreid (1970, figure 1), is about a half mile west of the mouth of Gold Run, another tributary to the Cripple River. The occurrence is at about 500 to 600 feet elevation and located to within about 500 feet.

Commodities:**Main:** Fe**Other:** Pb (?)**Ore minerals:** Hematite (?), limonite (?)**Gangue minerals:****Geologic description:**

The Lower Iron Creek gossan was located by Herreid (1970, figure 1) and shown to be about 600 feet long in a north-northwest direction. It is in massive marble, probably the same as the massive marble unit of Bundtzen and others (1994). This occurrence is probably similar to other iron oxide deposits in the area such as the Cub Bear prospect (NM133) and Iron Creek prospect (NM131). Herreid (1970) noted anomalous lead at this prospect, but it is not reflected in the one sample for which an analysis was reported from the occurrence (sample 146, Herreid, 1970).

The origin of the iron deposits in the area is uncertain. They may be iron oxide gossan developed by the oxidation of sulfide deposits (Eakin, 1915 [B 622-I, p. 361-365]; Mulligan and Hess, 1965; Herreid, 1970). Alternatively, they could be hypogene iron oxide (and iron carbonate) deposits. Inasmuch as several similar iron deposits nearby, such as the American prospect (NM014) and the Monarch prospect (NM017), contain anomalous amounts of zinc, they could be transitional to zinc-lead-fluorite deposits such as the Quarry prospect (NM135).

Alteration:

Age of mineralization:

Post mid-Cretaceous, the age of metamorphism of the host carbonate rocks.

Deposit model:

Iron oxide veins and replacement of marble and schist.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Surface exposure only; workings have not been described at this locality although it was probably prospected before 1915, as were other iron oxide prospects in the area.

Production notes:**Reserves:****Additional comments:****References:**

Eakin, 1915 (B 622-I); Mulligan and Hess, 1965; Herreid, 1970; Bundtzen and others, 1994.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Quarry**Site type:** Prospect**ARDF no.:** NM135**Latitude:** 64.7018**Quadrangle:** NM C-2**Longitude:** 165.7664**Location description and accuracy:**

The Quarry prospect is on a gentle ridge between Willow Creek and Cripple River at an elevation of about 900 feet and near the southeast corner of section 13, T. 9 S., R. 35 W., Kateel River Meridian. The prospect is about 1,000 feet northeast of, and visible from, the Nome-Teller road. It is probably the same deposit referred to as Kardex site Kx 52-38 in Heiner and Porter (1972) and shown at the head of Willow Creek in a claim map published by Alaska Division of Geological and Geophysical Surveys (1982). This is locality 8 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Ag, Ba, F, Pb, Zn**Other:** Au, Sb**Ore minerals:** Barite, boulangerite, fluorite, galena, limonite, pyrite, sphalerite**Gangue minerals:** Ankerite, aragonite, calcite, dolomite, quartz**Geologic description:**

The Quarry prospect is in the contact zone of marble and underlying schist; the marble unit is probably part of the massive marble unit of Bundtzen and others (1994). The main minerals are quartz, fluorite, and barite that replace the marble. They occur with disseminated to semimassive pods of galena, sphalerite and boulangerite. Galena and sphalerite also occur as disseminations in aragonite and calcite veins. The occurrence is nearly stratabound, but cross-cutting replacement fronts of ankerite, partly oxidized to limonite, flank the mineral deposits. A large lead and zinc soil anomaly, about 2000 by 6000 feet and elongated northwesterly along the marble-schist contact, is developed over the prospect. Grab samples contained as much as 0.02 ounce gold per ton and 5.30 ounces silver per ton (Herried, 1970).

Fluid inclusion studies (Brobst and others, 1971) show that mineralization was fairly high temperature (near 250 degrees F). The abundance of fluorite and slightly anomalous amounts of elements such as beryllium led Brobst and others (1971) to suggest a Late Cretaceous age of mineralization, similar to the fluorite-rich tin deposits of the northwestern Seward Peninsula.

Herreid (1970) interpreted the mineralization as being associated with a thrust at the base of the marble unit. In general, most of the relations are also consistent with mineralization controlled by shearing between two units of differing competency. The prospect is on strike with, and in a similar structural and stratigraphic setting to, the Galena prospect (NM135) about 2 miles to the northwest.

Alteration:

Silicification, dolomitization, and ankeritization.

Age of mineralization:

Probably Late Cretaceous; post regional metamorphism.

Deposit model:

Stratabound replacement lode of quartz-fluorite-barite with associated galena and sphalerite.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Some workings on the property appear to have been done about the time of World War I (Herreid, 1966, 1970). The prospect was probably re-exposed when work was done on a rock quarry for the Nome-Teller road. Fluorite-rich samples were collected by Mulligan and Hess (1965), probably from old workings. Heiner and Porter (1972) reported claim activity by Foster in 1966. The claims were later taken over by W. Hoogendorn and associates. The deposit was examined in the 1990's by Kennecott Exploration Company and by Cominco Exploration. A caved shaft probably dates from the earliest exploration.

Production notes:**Reserves:****Additional comments:****References:**

Mulligan and Hess, 1965; Herreid, 1966; Herreid, 1970; Brobst and others, 1971; Cobb, 1972 (MF 463); Heiner and Porter, 1972; Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (in Snowshoe Gulch)**Site type:** Occurrence**ARDF no.:** NM136**Latitude:** 64.7085**Quadrangle:** NM C-2**Longitude:** 165.6879**Location description and accuracy:**

Snowshoe Gulch is an east tributary to Cripple River; the mouth of the Snowshoe Gulch stream is 1.3 miles upstream from where the Nome-Teller road crosses Cripple River. The location is of one claim located in 1977 and reported as Kardex site Kx 52-330 (Alaska Division of Geological and Geophysical Surveys, 1982). The claim is at an elevation of about 500 feet on Snowshoe Gulch; its location is approximate.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Gold (?)**Gangue minerals:****Geologic description:**

Gold can be panned from Snowshoe Gulch, and this claim was probably staked for placer gold. Bedrock of Snowshoe Gulch is almost entirely massive marble (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

A single mining claim was located in 1977.

Production notes:

Reserves:

Additional comments:

References:

Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Alaska Division of Geological and Geophysical Surveys, 1982

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (in Daisy Swift Creek)**Site type:** Occurrence**ARDF no.:** NM137**Latitude:** 64.7175**Quadrangle:** NM C-2**Longitude:** 165.6581**Location description and accuracy:**

Daisy Swift Creek is a mile-long east tributary to upper Cripple River. Its mouth is 4.5 miles upstream from where the Nome-Teller road crosses Cripple River. The location is of the stream sediment anomaly at an elevation of about 650 feet; it is within about 500 feet of outcropping mineralized rock.

Commodities:**Main:** Au, Zn**Other:** Sb**Ore minerals:** Pyrite, sphalerite (?)**Gangue minerals:****Geologic description:**

During reconnaissance mapping of the area in 1990 by Kennecott Exploration Company, 2,300 ppm zinc and anomalous amounts of gold were found in a stream sediment sample from Daisy Swift Creek. The gold content of a panned concentrate from Daisy Swift Creek, collected about 2,000 feet above its mouth, was 1,570 ppb gold. Followup of stream sediment and panned concentrate samples led to discovery of a pyritized metabasite unit that contained more than 0.1 ounce of gold per ton and anomalous amounts of antimony. The source of the zinc anomaly was not determined.

Daisy Swift Creek flows generally northwest in a schist unit between major bodies of the massive marble unit of Bundtzen and others (1994). The schist is mainly calc-schist, but locally it includes silicic units of probable felsic volcanic origin. The schist also includes large boudin-like masses of metabasite (C.C. Hawley, Cindy Buxton, and D.L. Olson, written communication, 1992).

Alteration:

Pyritization.

Age of mineralization:

Deposit model:

Pyritized metabasite with Au.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The area was explored from 1990 to 1992 by Kennecott Exploration Co.; there is no evidence of previous exploration.

Production notes:**Reserves:****Additional comments:**

The source of the high zinc concentrations in stream sediments has not been determined.

References:

Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (in Aurora Creek)**Site type:** Occurrence**ARDF no.:** NM138**Latitude:** 64.7225**Quadrangle:** NM C-2**Longitude:** 165.6200**Location description and accuracy:**

Aurora Creek is an east tributary of upper Cripple River; its mouth is about 5.5 miles upstream from where the Nome-Teller road crosses Cripple River. The location is in Aurora Creek at an elevation of about 600 feet and about half-way between the head of the creek and its mouth on Cripple River. It is the location of Kardex site Kx 52-294 (Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). The location is about the center of a group of 15 claims staked in 1968.

Commodities:**Main:** Zn**Other:** Au**Ore minerals:** Gold, sphalerite**Gangue minerals:****Geologic description:**

A stratabound zinc-lead deposit (NM140) crops out in Aurora Creek about 1-mile above this location. Aurora Creek has been mined with hand tools for placer gold, especially in the benches on the southwest of Aurora Creek. Numerous boulders of zinc-bearing schist can be found along the stream. In 1968, Allan Doyle located 15 placer claims, nominally for zinc, along this part of Aurora Creek. One patented claim is within Doyle's claim block. This claim appears to have been located to control a head gate on a ditch rather than as a mineral location. Country rock is mainly the massive marble unit of Bundtzen and others (1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a); sphalerite-bearing boulders are

present in Aurora Creek gravels.

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

39a

Production Status:

Site Status: Inactive

Workings/exploration:

Fifteen claims were staked in 1968 during a period of activity on the Aurora Creek zinc-lead deposits (NM140). Some mining for placer gold has taken place along Aurora Creek and its west side benches.

Production notes:

Probably very minor production of placer gold.

Reserves:

Additional comments:

References:

Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Slate Creek**Site type:** Mine**ARDF no.:** NM139**Latitude:** 64.7421**Quadrangle:** NM C-2**Longitude:** 165.6219**Location description and accuracy:**

Slate Creek is a west tributary to Cripple River near its head. The mouth of Slate Creek is about 6 miles upstream from where the Nome-Teller road crosses Cripple River. Slate Creek has been mined for placer gold on a small scale about one-half mile above its confluence with Cripple River. The location is accurate within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite (?), gold, pyrite**Gangue minerals:****Geologic description:**

The lower part of Slate Creek has been placer mined for gold on a small scale. Pans taken near the head of Slate Creek and on Cripple River 2,000 feet below the mouth of Slate Creek contained more than 10,000 ppm of gold. A stream sediment sample collected in Slate Creek above the placer mine workings contained 1,600 ppm arsenic (C.C. Hawley, unpublished data).

The upper part of Slate Creek flows through calc- and chloritic-schist. Near its mouth, Slate Creek crosses a fault and is within a graphitic quartz schist unit (C.C. Hawley, Cindy Buxton, and D.L. Olson, written communication, 1992). The fault strikes north-east; it continues southwest to the Oregon Camp area and is called the Charlie Creek fault by Bundtzen and others (1994). This fault is known to be locally mineralized with stibnite and probably small amounts of gold.

Alteration:**Age of mineralization:**

The placer gold deposits are Quaternary. The mineralization along the Charlie Creek fault is probably Late Cretaceous or early Tertiary (post-mid-Cretaceous regional metamorphism).

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Small-scale placer workings are present on Slate Creek.

Production notes:**Reserves:****Additional comments:****References:**

Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Aurora

Site type: Prospect

ARDF no.: NM140

Latitude: 64.7158

Quadrangle: NM C-2

Longitude: 165.5909

Location description and accuracy:

The Aurora prospect is in the headwaters of Aurora Creek, an eastern tributary to upper Cripple River. The mineralization trends north-northwest in a zone that extends for more than 2 miles to a related deposit about 1 mile south of the Aurora prospect called the Christophosen (NM141). The location of the Aurora prospect is at the intersection of the mineralized trend with Aurora Creek; it is at an elevation of 700 feet. This location is the approximate discovery point; it is accurate within about 500 feet. This is locality 69 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Zn

Other: Ag, As, Au, Cu, F, Pb, Sb

Ore minerals: Arsenopyrite, barite, chalcopyrite, fluorite, galena, gold (?), pyrite, sphalerite, stibnite (?), tennantite (?)

Gangue minerals: Ankerite, dolomite, muscovite (sericite?), quartz

Geologic description:

The Aurora zinc (lead) deposit was discovered in 1966 as the result of followup of a geochemical survey using the cold extraction-dithizone method (Herreid, 1968). Prospecting fairly quickly found boulders of disseminated to semi-massive sulfides, especially sphalerite, scattered along a north-northwest trend bisected by Aurora Creek. The occurrence was located and initial work was done by Resource Associates of Alaska. Herreid (1970) also conducted more work in the area; he defined a soil anomaly along the deposit at least 7,000 feet long. In 1976 and 1977, Cominco mapped, explored, and drilled a series of 22 holes in the deposit. In general, mineralized intervals were too thin to be significant, but drillhole 76-17 found an interval more than 100 feet thick that contained about 5 percent zinc and some gold. In 1990, Kennecott Exploration Company began to explore the deposit, partly to evaluate a volcanic exhalative hypothesis for the origin of the deposit. Kennecott conducted new soil surveys, excavated a series of trenches by tracked backhoe, and completed some new drilling. The extent of mineralization was similar to that found by Cominco, and the prospect, leased from Bering Straits Regional

Corporation, was allowed to lapse. The work suggests that the origin of Aurora is very complex; early mineralization was probably syngenetic and related to rhyolitic volcanism. Remobilization of mineralization probably took place during Cretaceous metamorphism of the deposit. Gold was possibly introduced along northeast-striking faults during waning stages of Cretaceous tectonism.

Where the deposit crosses Aurora Creek, disseminated and semi-massive sulfide deposits grade into a nearly white quartz-sericite schist which contains knots of purple fluorite. This unit is part of the felsic, muscovite-bearing, metavolcanic schist mapped by Bundtzen and others (1994). The unit has at least three distinct facies; (1) zircon-rich muscovite quartz schist, (2) feldspar-rich porphyroblastic schist, and (3) tourmaline-bearing muscovite-quartz-feldspar schist. Ankerite and dolomite are commonly present and locally abundant. Whole-rock analyses obtained by Kennecott Exploration Company on samples of the nearly white quartz-muscovite schist indicated from 69 to 82 percent silica, 9.5 to 15.3 percent alumina, very low calcium, magnesium, and sodium, and 2.2 to 4.8 percent potassium (C.C. Hawley, Cindy Buxton, and D.L. Olson, written communication, 1992). Iron (reported as ferric iron) ranged from 1.9 to 6.6 percent, suggesting some ferrophengitic mica is present. Fluorine exceeded 1 percent in all four rock samples; all had high background zinc (hundreds of parts per million) and one sample contained 700 ppm lead. Except for their low content of sodium, the analyses are fairly typical of felsic igneous rocks. The white quartz sericite schist, believed to be a metarhyolite, stratigraphically overlies graphitic quartz schist.

The geology of a section through Cominco drillhole 76-17 is consistent with thickening of the mineralized section by folding. This drill hole also contains about 0.1 ounce of gold per ton. This part of the deposit is also cut by a strong northeast-trending fault. The fault displaces the zinc-rich layer and possibly was the conduit for late gold mineralization. Other parts of the Aurora prospect are carbonate hosted. Locally, there are zones that are mostly barite accompanied by fine-grained pyrite. Antimony and arsenic are the characteristic trace elements in the deposit. There is some arsenopyrite, but the antimony and arsenic may also be in a sulfosalt, such as tennantite. Pyrite exceeds arsenopyrite, and chalcopyrite is locally present. In almost all samples, sphalerite is the dominant sulfide; it is commonly light orange to brown, suggesting a low iron content.

Alteration:

Remobilization of metallic minerals and carbonates during Cretaceous metamorphism.

Age of mineralization:

Syngenetic in early Paleozoic (Devonian?) sedimentary and marine volcanic rocks with remobilization during mid-Cretaceous deformation and metamorphism. Mineralization along crosscutting structures is mid-Cretaceous or younger.

Deposit model:

Metamorphosed volcanogenic massive sulfide (Cox and Singer, 1986; model 28a [Kuroko massive sulfide]).

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

28a

Production Status: None

Site Status: Inactive

Workings/exploration:

Soil surveys conducted by Alaska Division of Geological and Geophysical Surveys (Herreid, 1970); shallow diamond drilling by Cominco in 1976-77; soil surveys, trenching, and drilling by Kennecott Exploration in 1991-93.

Production notes:

Reserves:

Additional comments:

References:

Herreid, 1968; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Christophosen**Site type:** Prospect**ARDF no.:** NM141**Latitude:** 64.6988**Quadrangle:** NM C-2**Longitude:** 165.5815**Location description and accuracy:**

The Christophosen prospect is on the ridge between the headwaters of Oregon Creek and Penny River; it is at an elevation of 1,620 feet at the ridge crest. Better mineralization occurs on the east slopes of the ridge, and the location shown is the approximate center of an area of zinc-bearing mineralization located within about 500 feet. The Christophosen prospect is on strike with and related to the Aurora prospect (NM140). This location is about 1.25 miles west-southwest of the location given by Cobb (locality 10; 1972 [MF 463], 1978 [OFR78-93]).

Commodities:**Main:** Zn**Other:** Ag, Au, Pb, Sb**Ore minerals:** Chalcopyrite, galena, pyrite, sphalerite, stibnite**Gangue minerals:** Ankerite, dolomite, quartz**Geologic description:**

The Christophosen prospect was discovered before 1916. When Mertie (1918 [B 662-I, p. 447]) visited the prospect in 1916, he found one caved shaft and reported sphalerite and pyrite with quartz. The locality was visited by Herreid (1968), who reported dolomite with sparsely disseminated galena, chalcopyrite, and sphalerite in an old prospect area. Approximately 500 feet south-southeast of the Christophosen pits is a rubble crop of sphalerite-bearing schist, similar to that found at the Aurora Creek prospect (NM140). It apparently lies stratigraphically above a graphitic quartz schist, as does the Aurora deposit. The zinc content of soils near the rubble crop exceeds 2,000 ppm; the soil also is strongly anomalous in lead and silver. The rubble crop is contained within a broader, north-northwest trending soil anomaly about 1,200 feet long and 400 feet wide where samples contain 1,000 ppm or more zinc. A lens of fine-grained cherty rock, possibly an exhalite layer, with disseminated galena, sphalerite, and stibnite appears to be stratigraphically above the sphalerite-bearing schist (Cindy Buxton and C.C. Hawley, written communication 1992). Country rock in the area of the prospect has been interpreted as a tightly folded complex of felsic metavolcanic schist and complexly mixed

chloritic, calcareous, and felsic schist (Bundtzen and others, 1994).

Alteration:

Dolomitization?

Age of mineralization:

Syngenetic in early Paleozoic (Devonian?) sedimentary and marine volcanic rocks.

Deposit model:

Metamorphosed volcanogenic massive sulfide (Cox and Singer, 1986; model 28a [Kuroko massive sulfide]).

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

28a

Production Status: None**Site Status:** Inactive**Workings/exploration:**

Several prospect pits are present; a shallow shaft was caved by 1916. Surface examination and sampling by Kennecott Exploration Company in 1991 and 1992.

Production notes:**Reserves:****Additional comments:**

See Aurora prospect (NM140).

References:

Mertie, 1918 (B 662-I); Herreid, 1968; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Bundtzen and others, 1994, and this report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Last Chance**Site type:** Prospect**ARDF no.:** NM142**Latitude:** 64.7215**Quadrangle:** NM C-2**Longitude:** 165.5381**Location description and accuracy:**

The Last Chance prospect is on the south side of the headwaters of Last Chance Creek at an elevation of about 650 feet. This is 1 mile northeast of the divide between Last Chance Creek and Penny River. The prospect is located to within about 500 feet. It is the same prospect as locality 19 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) but Cobb's location is about a half mile too far to the east.

Commodities:**Main:** Au, Pb, Sb**Other:** Ag**Ore minerals:** Galena, gold (?), pyrite, stibnite**Gangue minerals:** Ankerite, quartz**Geologic description:**

The Last Chance prospect consists of an adit driven south-southwest on the Penny River fault or a splay of the fault. The prospect was first reported by Smith (1908, p. 345). Mertie (1918 [B 662-I, p. 446]) also mentions it, but it appears unlikely that the prospect was visited by the U.S. Geological Survey at that time. The vein at the prospect was variously reported as 4 or 5 feet wide. It contained galena, pyrite, and stibnite with quartz and ankerite. Gold and silver were reported in assays, but the presence of native gold is uncertain. A 70-foot adit was driven on the vein. It is inferred from the lack of further development that the gold content of the vein was low, but there is abundant quartz float at the prospect. Sainsbury and others (1972 [OFR 72-321]) show placer gold mine workings to be present on Last Chance Creek for about 1 mile downstream from near this prospect. The prospect was relocated by a Kennecott Exploration Company in 1990; it is similar to the nearby Christophosen prospect (NM143). Country rock at the prospect is the chlorite-rich metaturbidite and marble unit of Bundtzen and others (1994).

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; host structure crosscuts rocks metamorphosed in the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined.

Site Status: Probably inactive

Workings/exploration:

The prospect was discovered by G. Christophosen, who was apparently very active in the area before 1915 (see also NM141 and NM143). A 70-foot adit was driven on the vein. It is inferred from the lack of further development that the gold content of the vein was low, but there is abundant quartz float at the prospect. The vein is in a strong structure.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Mertie, 1918 (B 662-I); Sainsbury and others, 1972 (OFR 72-321); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Christophosen; Last Chance**Site type:** Mine**ARDF no.:** NM143**Latitude:** 64.7382**Quadrangle:** NM C-2**Longitude:** 165.5333**Location description and accuracy:**

This mine is in upper Waterfall Creek, a name and stream not currently shown on the Nome C-2 topographic map. The creek is a north tributary of Last Chance Creek; it flows south through sections 6 and 8, T. 9 S., R. 34 W., Kateel River Meridian. The location shown, at an elevation of about 1,500 feet, is the approximate intersection of a mineralized segment of the Penny River fault and Waterfall Creek. The area is complexly mineralized; vein deposits were developed in short adits southeast of the location down to about 1,100 feet elevation along Waterfall Creek. This location is approximately the same as locality 20 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Sb**Other:** Ag, Au, Cu, Pb**Ore minerals:** Azurite, chalcopyrite, galena, gold (?), malachite, pyrite, pyrrhotite, stibnite**Gangue minerals:** Quartz**Geologic description:**

The Christophosen mine is on quartz-sulfide veins as much as 5 feet wide within a weakly mineralized shear zone hundreds of feet across. The shear zone strikes north-northeast and is a mineralized part of the Penny River fault. Discrete veins occur on subsidiary structures southeast of the main shear zone. Samples of the shear zone contained about 100 ppb gold and were strongly anomalous in arsenic. The associated quartz veins contain galena, stibnite, chalcopyrite and display surface stainings of azurite and malachite.

The main activity on the claims occurred before 1916, when the mine was visited by Mertie (1918 [B 662-I, p. 425-449]). According to Mertie (1918 [B 662-I, p. 439]), the shear zone is about 100 feet across, strikes about N 20 E, and contains pyrite, pyrrhotite, stibnite, and gold. The mine produced about 2.5 tons of stibnite-rich material that assayed more than 58 percent antimony and contained some gold and silver. A mineralized quartz vein concordant to schistosity was cut off by the shear zone. Although the vein contained sulfides, including stibnite, Mertie proposed that the quartz was early, predating the sul-

fide mineralization. The prospect was also visited by Herreid (1970, p. 36), who called it the Last Chance prospect. Herreid reported scattered stibnite crystals about 0.25 inch across in one quartz vein and found about 0.1 ounce of gold per ton in a graphitic fault zone about 900 feet northeast of the prospect. The country rock near the mine was mapped as chlorite-rich metaturbrite schist and marble by Bundtzen and others (1994).

Alteration:

Sulfidation along a wide shear zone.

Age of mineralization:

Mid-Cretaceous or younger; host structure crosscuts rocks metamorphosed in the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins; associated mineralized shear zone (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Yes**Site Status:** Inactive**Workings/exploration:**

The prospect was explored by surface pits and adits that were driven before 1916 on four mining claims (Mertie, 1918 [B 662-I, p. 425-449]). An upper adit was about 105 feet long; the lower adit, in part a crosscut, was driven N 25 W for about 270 feet. A total of about 2.5 tons of stibnite-bearing ore containing more than 58 percent antimony was mined and sold. The prospect was visited by Herreid (1970) and remapped and sampled by Kennecott Exploration Co. in about 1991.

Production notes:

More than 2.5 tons of stibnite ore assaying more than 58 percent antimony were produced.

Reserves:**Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Last Chance Creek**Site type:** Mine**ARDF no.:** NM144**Latitude:** 64.7240**Quadrangle:** NM C-2**Longitude:** 165.5003**Location description and accuracy:**

Last Chance Creek is in the northeast corner of the Nome C-2 quadrangle and adjacent parts of the Nome C-1 quadrangle; it was placer mined for gold from the headwaters (NM142) downstream to near Hazel Gulch in the Nome C-1 quadrangle. The location used is the boundary of the C-1 and C-2 quadrangles, which is the approximate mid-point between the head of pay at the Last Chance lode (NM142) and Hazel Gulch, which is partly on U.S. Mineral Survey No. 1839. This is locality 89 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) although he used a location farther downstream in the Nome C-1 quadrangle for the mine.

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, hematite, magnetite, pyrite, scheelite, stibnite**Gangue minerals:****Geologic description:**

Placer gold was discovered in Last Chance Creek in or before 1900 and some sluicing was reported in 1900 (Brooks and others, 1901, p. 80). Reportedly the creek was prospected extensively in 1901, but probably with poor results because the prospect was abandoned (Collier and others, 1908, p. 197). Some mining was reported in 1903. Gold was reported as coarse and rough, as well as bright (Collier and others, 1908) and iron-stained (Moffit, 1913, p. 87). Moffit also reported that mining near Dewey Creek (not currently named) recovered gold from heavy concentrate that also contained scheelite, pyrite, hematite, and magnetite. Coats (1944) confirmed minor amounts of scheelite. Sainsbury and others (1972 [OFR 72-321]) showed placer mine workings to be present downstream from the headwaters almost to the edge of the Nome C-2 quadrangle. Mining, at least partly by mechanical methods, has taken place from at least one-half mile above Hazel Creek to the mouth of the creek on the north fork of Snake River in the Nome C-1 quadrangle. Sampling by Kennecott Exploration Company in 1990 found more than 4,000 ppb gold in a panned concentrate from the mouth of Waterfall Creek and more than 9,000

ppb gold from a point about one-half mile below Waterfall and about a mile above Hazel Gulch (C.C. Hawley, Cindy Buxton, and D.L. Olson, written communication, 1992).
Bedrock along Last Chance Creek is mostly the chlorite-rich metaturbidite and marble unit of Bundtzen and others (1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; 39a).

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

39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Hand and small-scale mechanical operations occurred on Last Chance Creek. Mining was reported in 1900, 1903, and as recently as 1924 (Smith, 1926). Some of the tailings below Hazel Gulch could have been processed by small-scale mechanical operations after 1924.

Production notes:**Reserves:****Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Smith, 1926; Coats, 1944; Cobb, 1972 (MF 463); Sainsbury and others, 1972 (OFR 72-321); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Mountain Creek (Greenstone Creek)**Site type:** Prospect**ARDF no.:** NM145**Latitude:** 64.6947**Quadrangle:** NM C-2**Longitude:** 165.6518**Location description and accuracy:**

Mountain Creek is a north tributary of upper Oregon Creek (see NM146) in the northern part of section 22, T. 9 S., R. 35 W., Kateel River Meridian. The mouth of Oregon Creek is where the Nome-Teller road crosses Cripple River. Mountain Creek was apparently called Greenstone Creek by Herreid (1970); the name Mountain Creek is not used on current U.S. Geological Survey maps. This is locality 70 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and it is accurate to within about 500 feet.

Commodities:**Main:** Au**Other:** Sb, W**Ore minerals:** Gold, scheelite, stibnite**Gangue minerals:** Quartz**Geologic description:**

A placer gold deposit was discovered before 1904 in Mountain Creek; rich values were reported in schist-bearing gravel (Collier and others, 1908), and some mining was done in the lower part of the creek. Kennecott Exploration Company found about 5,000 ppb gold in a pan concentrate collected at the confluence of Mountain and Oregon Creeks. A negligible amount of scheelite has also been reported from the creek (Coats, 1944). Mountain Creek contains boulders of quartz as much as 3 feet across containing 1 to 2 percent stibnite for at least 1,000 feet upstream from its mouth.

The lower part of Mountain Creek is in a chloritic schist; a massive metabasite body crops out a few hundred feet west of the mouth of the creek (Bundtzen and others, 1994). The east boundary of the metabasite unit probably is a northeast-trending high-angle fault, called the Aurora fault by Bundtzen and others (1994). Above an elevation of about 650 feet in the creek, one or both sides of the creek are in marble.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Gold was discovered in this creek before 1901 (Brooks and others, 1901). Collier and others (1908, p. 214) reported plans to mine one claim in auriferous schist-bearing gravel in 1904.

Production notes:

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Coats, 1944; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Oregon Creek**Site type:** Mine**ARDF no.:** NM146**Latitude:** 64.6913**Quadrangle:** NM C-2**Longitude:** 165.6520**Location description and accuracy:**

Oregon Creek is a east tributary to Cripple River; the mouth of Oregon Creek is just above where the Nome-Teller road crosses Cripple River. The Oregon Creek placer consists of auriferous gravel in or near modern Oregon Creek and nearly parallel bench deposits on the southeast flank of the creek. The bench deposits terminate upstream at Short Creek (in Short Gulch), a south tributary to Oregon Creek. The placer deposit in Oregon Creek was mainly developed below Mountain Creek (NM145), a north tributary. Mountain Creek has also been called Greenstone Creek by Herreid (1970). The location is the approximate mid-point of the bench deposits. The creek and bench locations are the same as localities 71 and 72 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Bi, Ti, W**Ore minerals:** Bismuth, galena, gold, hematite, magnetite, rutile, scheelite, sphalerite, stibnite**Gangue minerals:** Garnet**Geologic description:**

Gold was discovered in Oregon Creek and adjacent bench deposits before 1901 (Brooks and others, 1901, p. 69, 92-94); the deposits were worked extensively before 1918. Gold, accompanied by magnetite, garnet, bismuth, rutile, and scheelite, occurs in the placer deposits (Collier and others, 1908, p. 211-213; Cobb, 1975 [MR-66]; Anderson, 1947). Boulders of schist containing galena and sphalerite were found in the placer open cuts (Herreid, 1970). Stibnite and quartz boulders occur upstream in Mountain Creek, and stibnite was found in place in schist on the south side of Oregon Creek by Kennecott Exploration Company in 1992. Calcareous schist and schistose marble boulders containing galena and sphalerite are similar to rocks found upstream at the Aurora (NM140) and Christophosen (NM141) prospects. The boulders are either derived from these deposits or another deposit closer to the placer deposits. Boulders of gneiss, apparently derived from the Kigluaik Mountains, are also found at Oregon Creek. The placer deposit in the

active creek was covered by only a few feet of gravel. Bench deposits were covered by about 20 to 25 feet of gravel. These deposits were mined both by drift and surface hydraulic methods. The pay zone on Oregon Creek was about 70 feet wide but less than 1 foot thick. Bedrock in the Oregon Creek area is mainly calc-schist, but outcrops on the north side of the creek appear to be a felsic schist, similar to the felsic schist unit exposed at Aurora Creek (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Active

Workings/exploration:

The placer deposits have been worked by surface hand operations, hydraulic cuts, and drift mining. Placer mining began in 1900; the gold produced in 1900 from Oregon and nearby Nugget (NM147), Mountain (NM145) and Hungry Creeks (NM149) was estimated at about 2,400 ounces (Brooks and others, 1901, p. 69). Mining was reported by Moffit (1905), Collier and others (1908), in 1914 by Eakin (1915 [B 622-I, p. 369-370]), in 1916 (Mertie, 1918 [B 662-I, p. 455]), and in 1918 (Cathcart, 1920, p. 189). The area was worked by non-float mechanical methods in 1940 (Smith, 1942, p. 57). Some mining by open-cut methods on the patented claims occurred in the 1990's.

Production notes:

Patented claims cover most of the bench placers.

Reserves:

There is at least a small placer resource left in the area, especially in the bench deposits.

Additional comments:**References:**

Brooks and others, 1901; Moffit, 1906; Collier and others, 1908; Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1920; Smith, 1942; Anderson, 1947; Herreid, 1970; Cobb, 1972 (MF 463); Cobb, 1975 (MR-66); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Nugget Gulch**Site type:** Mine**ARDF no.:** NM147**Latitude:** 64.6797**Quadrangle:** NM C-2**Longitude:** 165.6520**Location description and accuracy:**

Nugget Gulch is an east tributary to Oregon Creek in section 27, T. 9 S., R. 35 W., Kateel River Meridian. The mouth of Oregon Creek is where the Nome-Teller road crosses Cripple River. The gulch was mined about due south of the former village of Oregon; some mining was also done about 1 mile upstream. The location given is in the mined segment southeast of Oregon. Nugget Gulch is localities 73 and 74 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Bi, W**Ore minerals:** Bismuth, gold, hematite, magnetite, pyrite, rutile, scheelite.**Gangue minerals:** Garnet**Geologic description:**

Nugget Gulch was discovered and worked before 1901 (Brooks and others, 1901, p. 92, 95; Moffit, 1906, p. 136; Eakin, 1915, p. 369-370). A short distance above the junction of Nugget Gulch and Oregon Creek, a 25-foot-wide paystreak was discovered at a depth of 6 to 20 feet on a yellow clay, false bedrock on marble. The gold was relatively fine grained; most of the nuggets weighed less than 0.05 ounce. The gold occurred in a heavy mineral sand consisting mostly of fine octahedral magnetite. The concentrates also contained garnet, specular hematite, rutile, scheelite, native bismuth and pyrite, partly oxidized to hematite. Gold was also found intergrown with native bismuth (Collier and others, 1908, p. 213-214). A small deposit containing a similar suite of heavy minerals was mined in the 1903 season at a location about 1 mile above the mouth of the creek. The paystreak in upper Nugget Creek was 3 to 6 feet deep and from 30 to 50 feet wide. The upper paystreak was worked out in one season.

Bedrock in this area is primarily marble, but it locally includes partly oxidized pyritic greenstone. The marble unit exposed near the mouth of Nugget Gulch is the massive marble unit of Bundtzen and others (1994). About 1 mile above the mouth of the creek, marble is succeeded by a calc-schist unit.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

A placer discovery was made, probably by shafting, before 1901 (Brooks and others, 1901) and the deposit was mainly mined out before about 1906 (Collier and others, 1908). Two claims, reportedly for gold and bismuth, were active in 1958 (Heiner and Porter, 1972, Kardex site Kx 52-98; Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:**Reserves:****Additional comments:****References:**

Brooks and others, 1901; Moffit, 1906; Collier and others, 1908; Eakin, 1915 (B 622-I); Cobb, 1972 (MF 463); Heiner and Porter, 1972; Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Oregon Creek (below Nugget Gulch)**Site type:** Mine**ARDF no.:** NM148**Latitude:** 64.6832**Quadrangle:** NM C-2**Longitude:** 165.6849**Location description and accuracy:**

Oregon Creek is an east tributary to Cripple River; the mouth of Oregon Creek is where the Nome-Teller road crosses Cripple River. This site is 2 to 3 miles below Nugget Gulch (NM147). According to Collier and others (1908, p. 211), a section of ground about a half mile below the mouth of Nugget Creek was particularly productive and is this location. The location is also near six mining claims active between 1926 and 1965 (Heiner and Porter, 1972, Kardex site Kx 52-185; Alaska Division of Geological and Geophysical Surveys, 1982). This area was included in locality 71 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Bi, W**Ore minerals:** Bismuth, gold, hematite, magnetite, scheelite**Gangue minerals:** Garnet**Geologic description:**

Placer mining on Oregon Creek about a half mile below Nugget Gulch was in a gravel from 1.5 to 6 feet thick that consisted of schist, limestone (marble), and granite pebbles. Gold was bright, coarse, and little worn and was produced above a false, yellow-clay bedrock as well as in crevices in marble below the clay. The concentrates were rich in octahedral magnetite and contained some hematite, bismuth, and garnet. Approximately one-quarter mile above this locality, gold occurred mostly in a 2-foot-thick gravel section and in crevices in the underlying bedrock (Collier and others, 1908, p. 211-212).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Gold was discovered in Oregon Creek in the winter of 1898-99. Some ground about a quarter of a mile below Nugget Gulch was worked in 1900. The area was visited by F.L. Hess in 1903 who found production on eight claims along the creek. Parts of Oregon Creek have been worked more recently by mechanical methods. Activity on six claims was reported from 1927 until 1965 on Oregon Creek (Heiner and Porter, 1972, Kardex site Kx 52-185; Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:

Mining started in 1898 and continued intermittently to 1965.

Reserves:

Additional comments:

References:

Collier and others, 1908; Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Hungry Creek**Site type:** Mine**ARDF no.:** NM149**Latitude:** 64.6666**Quadrangle:** NM C-2**Longitude:** 165.6966**Location description and accuracy:**

Hungry Creek is an east tributary of Oregon Creek. The mouth of Hungry Creek is three quarters of a mile upstream of the junction of Oregon Creek and Cripple River at the Nome-Teller road. It has been mined for about 2 miles from near its mouth upstream nearly to an auriferous south branch called May Creek (NM176). The coordinate location is the approximate mid-point of the workings; it is accurate to within about 1,000 feet. This is locality 76 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Bi, Fe, Ti**Ore minerals:** Bismuth, gold, ilmenite, magnetite, rutile**Gangue minerals:** Garnet**Geologic description:**

Placer gold mining on Hungry Creek began soon after discovery in July, 1900. In 1903, there were three mines in operation, but most of the creek had some prospecting or mining by then (Collier and others, 1908). The creek had numerous rounded granitic boulders, derived from the Kigluaik Mountains; some of the pay gravel was decomposed chloritic schist fragments with intermixed boulders. Gold was accompanied by a small quantity of rounded bismuth nuggets as much as an ounce in weight. Magnetite was the most abundant mineral in the associated heavy mineral concentrates. In addition to mining on one of its headwater tributaries, May Creek (NM176), a small north tributary called Trilby Creek (NM177) was also placer mined. Trilby Creek is possibly located along the Aurora fault of Bundtzen and others (1994).

The lower part of Hungry Creek locally flows over dolostone. The dolostone may be alteration products like the dolostone at the many iron oxide deposits of the Sinuk River area (Bundtzen and others, 1994); an example is the nearby Cleveland occurrence (NM161). Bedrock on a part of the creek above a strong northeast fault is mainly the porphyroclastic graphitic schist unit of Bundtzen and others (1994). The fault, named the Aurora fault by Bundtzen and others (1994), is locally mineralized with antimony or gold

(see NM157, for example).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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 surface workings are present.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Cleveland Creek**Site type:** Mine**ARDF no.:** NM150**Latitude:** 64.6665**Quadrangle:** NM C-2**Longitude:** 165.7590**Location description and accuracy:**

This placer mine is in Cleveland Creek, a south tributary of the Cripple River. Cleveland Creek enters Cripple River three quarters of a mile below the Nome-Teller road. The location is the mid-point of placer tailings and is accurate to within about 500 feet. This is locality 66 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Cleveland Creek (not then named) was shown as auriferous and placer mined just above its mouth by Collier and others (1908). Sainsbury and others (1972 [OFR 72-321]) mapped the bedrock in the creek as graphitic schist.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:** Probably inactive

Workings/exploration:

Placer gold was produced near the mouth of Cleveland Creek by small-scale surface operations before 1908 (Collier and others, 1908, plate X).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Sainsbury and others, 1972 (OFR 72-321); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Stella Creek

Site type: Prospect

ARDF no.: NM151

Latitude: 64.6563

Quadrangle: NM C-2

Longitude: 165.8318

Location description and accuracy:

Stella Creek is an east tributary of Cripple River. The mouth of Stella Creek is about 3 miles downstream of where the Nome-Teller road crosses Cripple River. It is locality 67 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and is located within about a half mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

A placer deposit was reported by Collier and others (1908, p. 210-211) in Stella Creek. The deposit was in a parallel bench about 10 feet above modern Stella Creek. The bench channel was cut in quartz-chlorite schist bedrock, but it also contained many boulders of granite and gneiss derived from the Kigluaik Mountains. Recovery was reported as little better than wages.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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:

Stella Creek was probably discovered in 1900 (Brooks and others, 1901, p. 96). Workings had been developed before a visit by the U.S. Geological Survey in 1903 (Collier and others, 1908, p. 210-211). There is little indication of more recent mining.

Production notes:

Reserves:

Additional comments:

References:

Brooks, Richardson, and Collier, 1901; Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Cripple River**Site type:** Prospect**ARDF no.:** NM152**Latitude:** 64.6469**Quadrangle:** NM C-2**Longitude:** 165.8978**Location description and accuracy:**

The Cripple River bench placer is on the northwest side of the Cripple River valley. It extends about 1.5 miles upstream from the mouth of Fox Creek to the mouth of Elizabeth Creek. The deposit is approximately located downslope from the end of two parallel water ditches shown on the Nome C-2 topographic map near the boundary of sections 4 and 5, T. 10. S., R. 36 W., Kateel River Meridian. This is locality 64 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The prospect is a gravel bench on bedrock, 10 feet above and to the north above of Cripple River; Collier and others (1908, p. 210) reported it to contain an economic deposit of placer gold. A proposal was made to hydraulically mine the deposit, and at least two ditches were built to supply water to the prospect. One 4.5-mile-long ditch was completed in 1903. The ditch leaked badly, and a second ditch was constructed; it also is believed to have failed. No data exist on the gold content of the bench deposit.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined**Site Status:** Inactive**Workings/exploration:**

Attempts were made in 1903 and subsequent years to mine a placer gold deposit on a Cripple River bench below Elizabeth Creek. These attempts apparently failed because of leakage from one or more ditches constructed to develop the project (Collier and others, 1908). No recent activity is known at the site.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Arctic Creek (upper)**Site type:** Mine**ARDF no.:** NM153**Latitude:** 64.6335**Quadrangle:** NM C-2**Longitude:** 165.7423**Location description and accuracy:**

Arctic Creek is an east tributary of lower Cripple River. The mouth of Arctic Creek is about 5 miles upstream from the mouth of Cripple River on Norton Sound. Two segments of the creek have been mined, probably with gold derived in part from two different sources. Upper Arctic Creek is the part of the creek above its confluence with Bluff Creek. This location is an approximate mid-point of the section mined between the Nome-Teller road and the mouth of Bluff Creek. This is locality 78 of Cobb (1972 [MF 463]) but most of the information summarized by Cobb (1978 [OFR 78-93]) is for lower Arctic Creek (NM155).

Commodities:**Main:** Au**Other:** Pb, Sb, W**Ore minerals:** Gold, scheelite (?)**Gangue minerals:****Geologic description:**

Upper Arctic Creek was mined by hand methods for about 1 mile downstream from the Nome-Teller road and probably by mechanical methods for a half-mile segment above the mouth of Bluff Creek (NM154). Abundant granitic boulders have been stacked on the north side of the placer pit just below the Nome-Teller road, suggesting the possibility that some gold was derived by reworking glacial deposits. However, the unnamed northern tributary to Arctic Creek, above the Nome-Teller road, contains stream sediments that are strongly anomalous in lead and tungsten, suggesting local bedrock mineralization. A pan concentrate collected by Kennecott Exploration Company from this north tributary contained 830 ppm lead and 80 ppm tungsten. A pan concentrate from Arctic Creek just above Bluff Creek contained greater than 10,000 ppb gold. A bedrock sample of pyritic graphitic quartz schist collected about 500 feet above the confluence of Bluff Creek contained 15 ppb gold, 1,340 ppm arsenic, and 41 ppm antimony.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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:

Mostly shovel-in type workings; probably most date from before 1906 (Moffit, 1906, p. 136).

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1906; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Bluff Creek**Site type:** Prospect**ARDF no.:** NM154**Latitude:** 64.6224**Quadrangle:** NM C-2**Longitude:** 165.7495**Location description and accuracy:**

Bluff Creek is an east tributary of Arctic Creek; the mouth of Bluff Creek is about 1.5 miles down Arctic Creek from the Nome-Teller road. The course of lower Bluff Creek and a small north tributary are covered by patented mining claims, although there does not appear to have been any significant placer mining. The location given is the approximate mid-point of the patented claims.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Lower Bluff Creek and a small north tributary are covered by patented mining claims, although there does not appear to have been any significant placer mining. Bedrock in lower Bluff Creek is mineralized pyritic graphitic quartz schist; a bedrock sample collected on Arctic Creek (NM153) about 500 feet above the confluence of Bluff Creek contained 15 ppb gold, 1,340 ppm arsenic, and 41 ppm antimony. Bedrock in the general area of Bluff Creek was mapped as pelitic micaceous graphitic schist (Sainsbury and others, 1972 [OFR 72-321]; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

This is an area of patented mining claims, possibly the patented five claims of G. Schofield reported by Heiner and Porter (1972, Kardex site Kx 52-48).

Production notes:

Reserves:

Additional comments:

References:

Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-321); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Arctic Creek (lower)**Site type:** Mine**ARDF no.:** NM155**Latitude:** 64.6095**Quadrangle:** NM C-2**Longitude:** 165.7957**Location description and accuracy:**

Arctic Creek is an east tributary of lower Cripple River. The mouth of Arctic Creek is about 5 miles upstream from the mouth of Cripple River on Norton Sound. Two segments of the creek have been mined, probably with gold derived in part from two different sources. Lower Arctic Creek is the part of Arctic Creek below the confluence of Bluff Creek (NM154), an east tributary. This part of Arctic Creek was mined by a floating bucket line dredge. The location is the approximate mid-point of the placer tailings. Information for this mine was summarized by Cobb (locality 78, 1978 [OFR 78-93]) but his map location (Cobb, 1972 [MF 463]) is for upper Arctic Creek (NM153).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

From 1914 to at least 1922, an alluvial placer gold deposit was mined along lower Arctic Creek by a floating bucket line dredge over at least a half mile, starting about 1 mile above its mouth. The placer in lower Arctic Creek appears to have gold sources other than those that supplied gold to the upper part of Arctic Creek (NM153). These sources include Bluff Creek (NM154) and the wall rocks of a discordant quartz-ankerite vein exposed in the bluffs opposite the mouth of Bluff Creek (NM157). The lower part of a south-flowing tributary to Arctic Creek about a half mile below Bluff Creek has also been placer mined and is included here.

Arctic Creek is subparallel to the projection of a strong north-northeast fault mapped by Bundtzen and others (1994) as the Aurora fault. This fault is the control of vein mineralization (NM157). Strata along Arctic Creek near Bluff Creek are, in part, pyritic graphitic quartz schist, but most of the country rock is calcareous mica schist.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

A bucket line dredge operated on the lower part of Arctic Creek from 1914 until at least 1922 (Eakin, 1915 [B 622-I, p. 366-373]); Harrington, 1921; Brooks, 1922; Brooks and Capps, 1924.

Production notes:**Reserves:****Additional comments:****References:**

Eakin, 1915 (B 622-I); Harrington, 1921; Brooks, 1922; Brooks and Capps, 1924 (B 755-A); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Cobb, 1978

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Cripple River**Site type:** Mine**ARDF no.:** NM156**Latitude:** 64.6136**Quadrangle:** NM C-2**Longitude:** 165.8536**Location description and accuracy:**

Cripple River was reported to be auriferous from its headwaters to its mouth on Norton Sound by Collier and others (1908, plate X). The location given is the approximate mid-point of patented claims along a section of the river that extends from above Stella Creek (NM151) to its mouth on Norton Sound. This includes locality 65 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Collier and others (1908) reported that Cripple River was auriferous from its head to its mouth on Norton Sound. This was partly confirmed in the upper part of Cripple River during 1989-1990 reconnaissance exploration by Kennecott Exploration Company (written communication, 1992). Pan concentrates containing greater than 10,000 ppb gold were found in gravels of Cripple River above Aurora Creek. Gold was also panned both above and below Gold Run, a north headwater tributary. A pan concentrate at the mouth of Oregon Creek contained greater than 10,000 ppb gold. Both Cleveland Creek (NM150) and Stella Creek (NM151) were mined just above their confluences with Cripple River. A large right-limit (north side) bench of Cripple River was reported to be rich enough to hydraulic placer mine (NM152), but water losses in two ditches apparently precluded the mining of the bench deposit. Cripple River is almost continuously covered by patented mining claims from a point about 1 mile above Stella Creek (NM151) downstream to its mouth. There is little information on the distribution of gold along Cripple River itself.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Surface workings; there was some production locally on Cripple River and in tributaries before WW I (Brooks, 1904; Brooks, 1905; Collier and others, 1908; Smith, 1912; Chapin, 1914 [B 529-L, p. 385-395]).

Production notes:

Reserves:

Additional comments:

References:

Brooks, 1904; Brooks, 1905; Collier and others, 1908; Smith, 1912; Chapin, 1914 (B 592-L); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (Arctic Creek)**Site type:** Occurrence**ARDF no.:** NM157**Latitude:** 64.6280**Quadrangle:** NM C-2**Longitude:** 165.7734**Location description and accuracy:**

A quartz-ankerite vein crops out on the north bank of Arctic Creek about 800 feet west of the mouth of Bluff Creek. This is about 2 miles down Arctic Creek from the Nome-Teller road. The location is accurate within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Ankerite, quartz**Geologic description:**

A quartz-ankerite vein that strikes northeast and dips about 50 degrees to the northwest is exposed on the north bank of Arctic Creek about 800 feet below the mouth of Bluff Creek. The vein itself is apparently barren, but gold can be panned from its wall rocks. The vein appears to be on the structure called the Aurora fault by Bundtzen and others (1994). Mineralization at this and nearby sites may have contributed placer gold to the deposits mined in lower Arctic Creek (NM155).

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; located on a structure that cuts rocks metamorphosed in the mid-Cretaceous.

Deposit model:

Low-sulfide Au-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 vein is exposed in a natural outcrop.

Production notes:

Reserves:

Additional comments:

References:

Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Sonora Creek**Site type:** Prospect**ARDF no.:** NM158**Latitude:** 64.6047**Quadrangle:** NM C-2**Longitude:** 165.9232**Location description and accuracy:**

Sonora Creek is a small 2-mile-long stream that flows south to Norton Sound about 4 miles west of the mouth of Cripple River. The placer on Sonora Creek is less than a mile from the coast at about the point where Sonora Creek flows onto the coastal plain (Heiner and Porter, 1972, Kardex site Kx 52-92; Alaska Division of Geological and Geophysical Surveys, 1982). The location is approximate, but probably within a half mile along the creek.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Gold was discovered and claims located on Sonora Creek in 1900; there was some development work done in 1901 (Collier and others, 1908). Because this location is near where Sonora Creek flows onto a marine terrace of the Norton Sound coastal plain, coastal processes may have influenced placer development. Sainsbury and others (1972 [OFR 72-321]) mapped the bedrock in the area as schistose graphitic siltite, phyllite, and calcareous graywacke.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au ? (Cox and Singer, 1986; model 39a).

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

39a ?

Production Status: None

Site Status: Inactive

Workings/exploration:

Surface work; discovery in 1900 and some development in 1901 but there has apparently been little or no work since.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-321); Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (on present beach of Norton Sound)

Site type: Mine

ARDF no.: NM159

Latitude: 64.6327

Quadrangle: NM C-2

Longitude: 165.7460

Location description and accuracy:

Placer gold on the modern beach of Norton Sound was discovered at Nome in 1899. The beach was mined from Quartz Creek to the west (in the Nome C-3 quadrangle) to Cape Nome to the east (in the Nome B-1 quadrangle). The segment of the beach discussed here is in the Nome C-2 quadrangle and includes a mile of the easternmost Nome C-3 quadrangle. The location is the approximate mid-point of the beach in the Nome C-2 quadrangle. This is partly included in locality 142 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Ti, W

Ore minerals: Gold, ilmenite, magnetite, pyrite, scheelite

Gangue minerals: Garnet

Geologic description:

Relatively small amounts of so called beach gold were recovered from the segment of the modern beach between Snake River and a point just west of Quartz Creek in the Nome C-3 quadrangle (Collier and others, 1908). Although some of the gold in this segment probably came from western long-shore drift from the Snake River system, the gold was partly derived from less important auriferous drainages including Penny River (NM184), Cripple River (NM156), Sonora Creek (NM158), and Quartz Creek (NM121 and 122).

The modern beach is generally 100 to 150 yards wide. The gold is mainly fine-grained but includes a few small (2 to 3 pennyweight [0.1 to 0.15 ounce]) nuggets. They occur in lenticular deposits associated with concentrations of garnet and magnetite, and lesser amounts of pyrite and ilmenite. Higher concentrations of gold tend to occur on blue clay layers below 1 to about 7 feet of sand and gravel. The pay zones range from a few inches to 2 feet in thickness. Most of the gold is bright and irregular in shape (Schrader and Brooks, 1900, p. 18-19). The average fineness of recovered beach gold was about 890 (Brooks and others, 1901).

The present beach is developed along the seaward side of a broader coastal plain containing marine gravel, sand and silt deposits developed during Quaternary marine transgressions (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Holocene beach placer formed by winnowing by wave action and long-shore currents.

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

Production Status: Yes; medium

Site Status: Probably inactive

Workings/exploration:

The beach placers were discovered in 1899 and were worked immediately after discovery. In 1899, as much as 1,000,000 dollars (nearly 50,000 ounces) was recovered from the beach deposits, mostly, however, on the more productive segment east of the Nome C-2 quadrangle (Schrader and Brooks, 1900). Production was mostly with rockers, and gold was either caught on blankets or was amalgamated.

Production notes:**Reserves:**

Local concentrations of gold are still produced during winter storms.

Additional comments:**References:**

Schrader and Brooks, 1900; Brooks and others, 1901; Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Schrader and Brooks, 1900

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Wheel Creek**Site type:** Occurrence**ARDF no.:** NM160**Latitude:** 64.6465**Quadrangle:** NM C-2**Longitude:** 165.6382**Location description and accuracy:**

Wheel Creek is a small west tributary to Penny River. The mouth of Wheel Creek is about 4.2 miles up Penny River from the Nome-Teller road.

Commodities:**Main:** Au**Other:** Ba**Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Gold was panned on Wheel Creek in 1991 during the Kennecott Exploration Company evaluation of the area. Herreid (1970) also reported a barium geochemical anomaly on the creek. The creek apparently follows a steep east-striking fault that cuts through massive marble and graphitic quartzite (Bundtzen and others, 1994). The headwaters of Wheel Creek have the same geologic setting as the headwaters of Hungry Creek (NM149) and May Gulch (NM176), which are known to be gold-bearing.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Very limited stream sediment sampling and panning has taken place here.

Production notes:

Reserves:

Additional comments:

Wheel Creek appears too narrow and steep to contain a significant placer deposit, but the occurrence indicates the presence of lode deposits in the drainage.

References:

Herreid, 1970; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Cleveland Creek**Site type:** Occurrence**ARDF no.:** NM161**Latitude:** 64.6599**Quadrangle:** NM C-2**Longitude:** 165.7192**Location description and accuracy:**

This occurrence, called the Cleveland Creek gossan by Herreid (1970), is at an elevation of about 600 feet on the south side of hill 738 in the headwaters of Cleveland Creek, an east tributary to Cripple River. The occurrence was mapped by Bundtzen and others (1994). It is 2,400 feet northeast of the Nome-Teller road; the location is accurate.

Commodities:**Main:** Fe**Other:** Pb, Zn**Ore minerals:** Goethite, hematite**Gangue minerals:** Dolomite**Geologic description:**

An iron oxide occurrence lies on the south side of hill 738 in the headwaters of Cleveland Creek in or adjacent to the massive marble unit of Bundtzen and others (1994). Herreid (1970, p. 18) called this the Cleveland Creek gossan and found anomalous amounts of lead and zinc, as at the nearby Cub Bear prospect (NM133) and some other iron oxide prospects of the Sinuk River area. The Cleveland Creek occurrence may be in a structural and stratigraphic setting similar to those at the Quarry (NM135) and Galena (NM130) prospects.

Alteration:

Dolomitization.

Age of mineralization:

Post mid-Cretaceous, the age of regional metamorphism of the country rocks.

Deposit model:

Iron oxide vein and replacement of marble and schist.

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

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Surface exposures in natural outcrop and rubble crop; some geochemical sampling by Herried (1970).

Production notes:

Reserves:

Additional comments:

References:

Herreid, 1970; Bundtzen and others, 1994.

Primary reference: Herreid, 1970

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Willow Creek

Site type: Mine

ARDF no.: NM162

Latitude: 64.5997

Quadrangle: NM C-2

Longitude: 165.6924

Location description and accuracy:

Willow Creek is a west tributary to lower Penny River. The mouth of Willow Creek is about 500 feet down Penny River from the Nome-Teller road. The location is the approximate mid-point of patented claims that extend for about 2.5 miles along the creek.

Commodities:

Main: Au

Other: Sn

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:

A placer gold deposit on Willow Creek was mined as early as 1914 (Eakin, 1915 [B 622-I, p. 369-370]). Claims were patented about 1924, and activity continued at least until 1965 (Heiner and Porter, 1972, Kardex site Kx 52-100; Alaska Division of Geological and Geophysical Surveys, 1982). The main block of claims was patented as U.S. Mineral Survey No. 1866. Cassiterite was reported in the concentrates (Martin, 1919, p. 20).

Willow Creek cuts across the Penny River fault about 4,000 feet above its mouth. Uppermost Willow Creek is in the massive marble unit of Bundtzen and others (1994). The source of cassiterite and gold in Willow Creek is uncertain, although Herreid (1970, p. 20) indicated that some bedrock mineralization is present in the area.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes**Site Status:** Probably inactive**Workings/exploration:**

Open cut mining took place before 1914. A large block of claims was patented by 1924.

Production notes:**Reserves:****Additional comments:****References:**

Eakin, 1915 (B 622-I); Martin, 1919; Herreid, 1970; Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Eakin, 1915**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Steiner**Site type:** Prospect**ARDF no.:** NM163**Latitude:** 64.5918**Quadrangle:** NM C-2**Longitude:** 165.6852**Location description and accuracy:**

The Steiner prospect is reported to be about 1 mile west of Penny River, 4.5 miles north from the coast, at an elevation of 200 feet, and south of an unnamed east-flowing stream immediately south of Willow Creek (Cathcart, 1922, p. 256, figure 9). This is approximately locality 9 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The stated distances do not match the map location, either in elevation or the distance from the coast, so this location is very uncertain. A caved shaft less than a quarter mile north of the Nome-Teller road in the SE1/4 section 35, T. 10 S., R. 35 W., Kateel River Meridian, appears to have about the same amount of workings reported for the Steiner prospect, but it is about 1 mile east of Penny River. Mertie (1918, p. 427) visited the Steiner prospect, which he describes as 'on a spur between the Penny River and one of its small tributaries...at an elevation of about 200 feet'. This description would match that for the shaft in section 35.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, pyrite**Gangue minerals:** Calcite, feldspar, quartz**Geologic description:**

Cathcart (1922, p. 256) reports that a 105-foot shaft was sunk on a 5- to 10-foot-wide, east-striking, quartz-feldspar vein. The vein was followed 60 feet in the shaft and lost. Values of 7 dollars per ton (about 0.35 ounce of gold per ton) were reported but not confirmed. It seems questionable whether Cathcart actually visited this prospect. The shaft dump on the east side of Penny River is at least partly in graphitic quartz schist, reportedly one of the rock types at the Steiner prospect. Mertie (1918 [B 662-I, p. 427]) visited this mine, but it was not open at the time. He reported the shaft to be 135 feet deep with 100 feet of drift. Mertie (1918) also reported the rock on the dump as iron-stained pyritized schist, which agrees with C.C. Hawley's inspection of the site in section 35 east of Penny River.

Alteration:

Pyritization.

Age of mineralization:

Mid-Cretaceous or younger; vein crosscuts metamorphic rocks.

Deposit model:

Low-sulfide Au-quartz vein (Cox and Singer, 1986; model 36a).

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

36a

Production Status: No**Site Status:** Inactive**Workings/exploration:**

Uncertain; 105-foot shaft with 220 feet of drifting reported by Cathcart (1922), but Mertie (1918 [B 662-I, p. 427]) reported a 135-foot shaft with 100 feet of drifting at a nearby location, if not this one.

Production notes:**Reserves:****Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Mertie, 1918**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Unnamed (ridge between Butterfield and upper Bangor Creeks)**Site type:** Occurrence**ARDF no.:** NM164**Latitude:** 64.6901**Quadrangle:** NM C-2**Longitude:** 165.5142**Location description and accuracy:**

This occurrence is at an elevation of about 1,250 feet on the ridge crest between the headwaters of Bangor and Butterfield Creeks in the northwest Nome C-2 quadrangle. Mining claims were located on intensely deformed quartz-rich schist, probably before 1920. Claim locators used metamorphic quartz rods as much as 6 feet long and 6 inches in diameter as claim markers. The location is accurate within about 1,000 feet.

Commodities:**Main:** Au**Other:** As**Ore minerals:****Gangue minerals:****Geologic description:**

This occurrence is at or near the crest of an antiform where intensely deformed schist contains weakly mineralized quartz, including quartz rods (Kennecott Exploration Company, written communication, 1992). The quartz rods and linear elements in the schist plunge to the north-northwest. The area was apparently prospected in the early years of the Nome district, probably before 1920; quartz rods were used as claim posts.

Quartz and schist from the site contain as much as 0.02 ounce of gold per ton and hundreds of parts per million arsenic. The occurrence is of interest because it may indicate pre-metamorphism gold mineralization or mineralization during a ductile stage of metamorphism. In either case, the mineralization is older than the widespread low-sulfide Au-quartz veins of the Nome district.

Alteration:

Pre-metamorphism quartz veining or replacement?

Age of mineralization:

Mineralization either predates regional metamorphism or took place during a ductile

stage of deformation, possibly mid-Cretaceous.

Deposit model:

Metamorphosed low-sulfide Au-quartz veins?

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Claims staking and surface prospecting appears to have taken place here before 1920.

Production notes:

Reserves:

Additional comments:**References:**

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Boulder Creek; Claus Rodine**Site type:** Prospect**ARDF no.:** NM165**Latitude:** 64.6505**Quadrangle:** NM C-2**Longitude:** 165.5180**Location description and accuracy:**

Boulder Creek is a west tributary to Snake River; it flows east from headwaters in the eastern Nome C-2 quadrangle. The prospect is on the south side of Boulder Creek, approximately at the elevation of a prominent ditch and about 1,100 feet above the confluence of Twin Mountain Creek (shown as Twin Mtn Ck on the map) and Boulder Creek (Mertie, 1918 [B 662-I, p. 425-449]). The location is within a mineralized area mostly above the Boulder Creek prospect. It is accurate within about 1,000 feet. Locality 37 (Boulder lode) of Cobb (1972 [MF 463], 1978 [OFR 78-93]), is nearly coincident with some quartz veins but it is about one-half mile downstream from this prospect.

Commodities:**Main:** As, Sb**Other:** Au, Pb, W**Ore minerals:** Arsenopyrite, galena, gold, scheelite, stibnite**Gangue minerals:** Ankerite, quartz**Geologic description:**

The Boulder Creek or Claus Rodine prospect is a complex deposit related generally to the Rodine fault (Bundtzen and others, 1994). The prospect was first reported by Mertie (1918 [B 662-I, p. 427-429]), who noted that a 50-pound pod of stibnite had been mined from a pit near the adit and that quartz in the adit locally contained crystalline scheelite. Cathcart (1922, p. 252) also visited the prospect and reported quartz veins with pyrite and arsenopyrite associated with extensive sulfidation of schist.

The deposit was relocated by Kennecott Exploration Company in about 1991, and although the adit was reopened, it was too dangerous for underground work. The prospect was within the area of a large Kennecott soil geochemistry survey, and two trenches were cut above and parallel to a placer ditch, at right angles to the Rodine fault. The soil geochemistry survey shows that the Boulder Creek area is highly anomalous in arsenic and antimony, but only moderately anomalous in gold. Values in soil approaching the Rodine fault are as much as 3,100 ppm arsenic and 190 ppm antimony. The maximum amount of gold in a soil was 76 ppb. Rock samples collected along the trench system locally exceed

10,000 ppm arsenic and contain as much as 0.03 ounce of gold per ton.

At the prospect, the Rodine fault juxtaposes marble to the west against mica-schist; most of the mineralization, extending for as much as 100 feet east of the fault, is in schist. Rubble above the prospect is locally composed of ankeritic marble with some quartz. The country rock schist on the east side of the Rodine fault was mapped by Bundtzen and others (1994) as calcareous metaturbidite schist, a unit inferred to be relatively old and to lie near the base of the section along the Twin Mountain antiform.

Alteration:

Sulfidation of schist and ankeritization of marble.

Age of mineralization:

Mid-Cretaceous; postdates regional metamorphism and is probably similar in age to other low-sulfide Au-quartz veins of the Nome district (see, for example, the Divide prospect, NM058).

Deposit model:

Low-sulfide Au-quartz veins (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:**

An adit had been driven about 87 feet when the prospect was visited by Mertie in 1916; it was subsequently extended a few more feet. The prospect had power from a small Pelton wheel that was still at the site in 1995. A large soil geochemistry survey was completed and about 600 feet of trenches were cut in 1992 or 1993 by Kennecott Exploration Company.

Production notes:

A small amount of high-grade stibnite ore may have been mined.

Reserves:**Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Twin Mountain Creek (Yellow Bird claims)**Site type:** Mine**ARDF no.:** NM166**Latitude:** 64.6606**Quadrangle:** NM C-2**Longitude:** 165.5001**Location description and accuracy:**

Twin Mountain Creek (shown as Twin Mtn Ck on the map) is a north tributary of Boulder Creek. Boulder Creek is a west tributary to Snake River; it flows east from headwaters in the eastern Nome C-2 quadrangle. Twin Mountain Creek and a series of west side benches were placer mined. The upper part of Twin Mountain Creek is on the Nome C-1 quadrangle (where it is shown as Twin Mountains Creek). The location used here is about the mid-point of placered ground on Twin Mountain Creek. Twin Mountain Creek is locality 94 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); his map location is at the confluence of Twin Mountain and Boulder Creeks.

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, scheelite**Gangue minerals:****Geologic description:**

A shallow placer deposit on Twin Mountain Creek (shown as Twin Mtn Ck on the map) just above Boulder Creek was worked in 1903 and earlier, but apparently without profit (Collier and others, 1908, p. 197). Prospecting during World War I resulted in discovery of scheelite, which was mined by placer mining methods in the bench deposits on the west side of the creek (Mertie, 1918 [B 662-I, p. 437, 455, 457]). About 500 pounds of scheelite were recovered from a bench claim opposite claim No. 4 Above Discovery, a location almost 1 mile above Boulder Creek. Coats (1944) proposed that Twin Mountain Creek could contain significant amounts of scheelite. Some activity in Twin Mountain Creek took place as late as 1953 when eight 'Yellow Bird' claims were staked (Heiner and Porter, 1972, Kardex site Kx-52-1).

Exploration and mapping since 1953 indicates that Twin Mountain Creek flows through a significantly mineralized area. Pan concentrate samples collected at the mouth of Twin Mountain Creek and its two uppermost tributaries by Kennecott Exploration Company in 1990 and 1991 contained more than 10,000 ppb gold. A north-northeast-trending soil

geochemistry grid was sampled in 1992; the north half of the grid is approximately bisected by Twin Mountain Creek (Kennecott Exploration Company, written communication, 1992). This survey showed that soils extending northward from the Boulder Creek prospect (NM165) almost to Butterfield Creek and along the west side of the Twin Mountain Creek valley are moderately to strongly enriched in gold and arsenic and locally enriched in lead, zinc, and antimony. As the result of the soil survey, several new hard-rock mineral occurrences were found. The most significant was the Twin Mountain prospect at the head of Twin Mountain Creek (Bundtzen and others, 1994, sheet 1 of 2). Because of heavy soil cover and solifluction lobes on the slopes immediately above Twin Mountain Creek, it is not possible to exactly limit the eastern extent of the soil anomaly, but it is generally parallel to Twin Mountain Creek and appears to be located on the Rodine fault. These deposits are probably the sources of the placer deposits in Twin Mountain Creek. Some deposits, such as the scheelite deposit opposite No. 4 Above Discovery, are essentially residual placer deposits.

Twin Mountain Creek also generally parallels the Twin Mountain antiform, a structure that exposes biotite schist in the bottom of the valley. This biotite schist has tentatively been correlated with metamorphic rocks underlying the Nome Group (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au-W and residual deposits (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:

Gold was discovered and some was placer mined in Twin Mountain Creek (shown as Twin Mtn Ck on the map) in 1900 (Brooks and others, 1901, p. 80). The lower part of the creek was mined unsuccessfully before 1903. Other mining took place in 1916 when scheelite was sluiced from residual placer deposits on the west side of Twin Mountain Creek. Placer claim activity occurred as recently as 1953 (Heiner and Porter, 1972). A large soil geochemistry survey was completed in the area in 1992.

Production notes:

At least 500 pounds of scheelite were produced from the residual placers on the benches west of Twin Mountain Creek.

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Mertie, 1918; Coats, 1944; Heiner and Porter, 1972; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (Boulder Creek east bench)**Site type:** Prospect**ARDF no.:** NM167**Latitude:** 64.6503**Quadrangle:** NM C-2**Longitude:** 165.5020**Location description and accuracy:**

This prospect is on the bench east of the mouth of Twin Mountain Creek (Twin Mtn Ck on the map) and north of Boulder Creek. Boulder Creek is a west tributary to Snake River; it flows east from headwaters in the eastern Nome C-2 quadrangle. Mineralization continues to the west, and the prospect is also probably related to quartz and sulfide vein mineralization reported as the Dakota group of some 13 claims (NM174) on Boulder Creek below Twin Mountain Creek (Mertie, 1918 [B 662-I, p. 429]). The prospect includes two adits reported to be driven in the east bank of Twin Mountain Creek (Cathcart, 1922, p. 248-249).

Commodities:**Main:** Au**Other:** As, W (?)**Ore minerals:** Arsenopyrite, pyrite, scheelite (?)**Gangue minerals:** Quartz**Geologic description:**

This prospect was discovered in 1992 by following up results of a soil geochemistry survey. Mineralization continues to the south and the prospect is also probably related to quartz and sulfide vein mineralization reported as the Dakota group of some 13 claims (NM174) on Boulder Creek below Twin Mountain Creek (Mertie, 1918 [B 662-I, p. 429]). A soil geochemistry survey was completed on the northeast bench of Boulder Creek downstream from its confluence with Twin Mountain Creek in 1991. Soil samples were collected on 50-foot intervals on northeast lines about 200 feet apart. Some samples contained more than 1 percent arsenic and more than 2,000 ppb gold. In general, a strong arsenic anomaly (values in hundreds of parts per million) extends northwesterly across the bench. A series of five trenches with a total length of 900 feet was excavated; four were parallel to the soil sample lines and one crossed them. All trenches found mineralized zones, although establishing continuity between individual zones was difficult. A trench excavated on the soil line with values greater than 1 percent arsenic and 2,000 ppb gold (Trench NEBLdr-T1, Kennecott Exploration Company, written communication, 1992)

found a massive quartz-arsenopyrite vein below 10 feet of overburden. A 30-foot-long zone in bedrock centered on the vein averaged 6.4 ppm gold and greater than 1 percent arsenic. Trenches 80 feet west and 100 feet east found lower values; these consisted of as much as 10 feet of 1,020 ppb gold 100 feet to the east and 10 feet of 4,400 ppb gold 80 feet to the west. A trench excavated 400 feet to the west of Trench NEBLdr-T1 contained one 10-foot sample with greater than 10 ppm gold and a 30-foot sample with about 500 ppb gold. This mineralization probably extends northwesterly into Twin Mountain Creek and could include the occurrences described in two adits driven into the east side of Twin Mountain (Cathcart, 1922, p. 251). One of these adits reportedly contained scheelite in a quartz-feldspar vein. The northwesterly trending mineralization at this prospect may be cut off or displaced by the Rodine fault (Bundtzen and others, 1994).

Alteration:

Sulfidation of schist.

Age of mineralization:

Mid-Cretaceous; postdates regional metamorphism and is probably similar in age to other low-sulfide Au-quartz veins of the Nome district (see, for example, the Divide prospect, NM058).

Deposit model:

Low-sulfide Au-quartz veins (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:**

Kennecott Exploration Company completed about 900 feet of trenches in 1992 to follow up arsenic and gold soil anomalies on the bench northeast of the confluence of Twin Mountain and Boulder Creek. The trenches were backfilled and reclaimed after mapping and sampling.

Production notes:**Reserves:****Additional comments:**

The northwesterly trending mineralization at this prospect may be cut off or displaced by the Rodine fault (Bundtzen and others, 1994).

References:

Mertie, 1918 (B 662-I); Cathcart, 1922; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Boulder Creek**Site type:** Mine**ARDF no.:** NM168**Latitude:** 64.6473**Quadrangle:** NM C-2**Longitude:** 165.5073**Location description and accuracy:**

Boulder Creek is a west tributary to Snake River; it flows east from headwaters in the eastern Nome C-2 quadrangle. An alluvial placer gold deposit was worked downstream from the Boulder Creek lode prospect (NM165) over a distance of about a mile. The location is the approximate mid-point of the placer mine and just below the junction of Boulder and Twin Mountain Creeks (Twin Mtn Ck on the map); it is accurate to within about 500 feet. Mining claims on this part of Boulder Creek are patented. This is locality 94 of Cobb (1972, MF-463; 1978, OFR 78-93).

Commodities:**Main:** Au**Other:** Bi, Sb, W**Ore minerals:** Bismuth, gold, hematite, ilmenite, magnetite, scheelite, stibnite**Gangue minerals:****Geologic description:**

An alluvial placer gold deposit was worked downstream from the Boulder Creek lode prospect (NM165) over a distance of about a mile. The locality was known shortly after the discovery of the Nome district (Collier and others, 1908, p. 196), and mining claims along the creek are patented. The paystreak varied from about 100 to 300 feet in width and was from 10 to 25 feet deep. Concentrates from Boulder Creek contained native bismuth, stibnite, hematite, ilmenite and magnetite. Scheelite occurred in the concentrates below Twin Mountain Creek (Coats, 1944). The apparent head of the paystreak is the Boulder Creek lode prospect (NM165). The Boulder Creek lode is apparently developed on subsidiary structures to the Rodine fault, a major north-northeast fault of the Nome district (Bundtzen and others, 1994). Some of the placer gold in Boulder Creek is almost certainly derived from the fault and associated mineralized structures. Lower Boulder Creek flows over mica-schist and marble bedrock; some of the marble is strongly altered to ankerite.

Alteration:

Marble is altered to ankerite.

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Boulder Creek was worked from about 1900 until as late as 1924 (Smith, 1924). It probably had a moderate amount of production. Collier and others (1908) reported that the gold was coarse but that miners in 1903 were making little more than wages. Placer mine activity was also reported in 1913 (Chapin, 1914, [B 592-L, p. 389]), 1914 (Eakin, 1915 [B 622-I, p. 370]), 1916 (Mertie, 1918 [B 662-I, p. 455]), and 1918 (Cathcart, 1920, p. 188). The miners apparently used an elevated sluice fed by a hydraulic elevator.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Chapin, 1914 (B 592-L); Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1920; Smith, 1926; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Sledge Creek**Site type:** Prospect**ARDF no.:** NM169**Latitude:** 64.6370**Quadrangle:** NM C-2**Longitude:** 165.5042**Location description and accuracy:**

Sledge Creek is a west tributary to Snake River. A placer gold deposit has been mined at the surface near the point where the creek enters the Snake River valley and was drift mined at unknown locations. The location is the site of surface mining. It is accurate within about 1,000 feet. Cobb (1978 [OFR 78-93]) summarized information about this locality under the name 'Sledge Cr.'.

Commodities:**Main:** Au**Other:** Ag, Sn, W**Ore minerals:** Cassiterite (?), gold, scheelite**Gangue minerals:****Geologic description:**

Sledge Creek has been mined at the surface in a shallow deposit near where the creek emerges from the hills and enters the Snake River valley. Drift mining at two unknown locations was also reported by Mertie (1918 [B 662-I, p. 454]). Patented claim U.S. Mineral Survey No. 1343 is in lower Sledge Creek, immediately above the surface placer cut, and claim U.S. Mineral Survey No. 1840 is in the south fork of Sledge Creek. Gold and tungsten were reported at the former site (Heiner and Porter, 1972, Kardex site Kx 52-259). Tungsten in scheelite was also reported by Thorne and others (1948, p. 33) in Sledge Creek. Kennecott Exploration Company found gold in two pan concentrate samples collected 1,500 and 3,000 feet below the south fork junction. The samples, contained more than 4 and more than 2 ppm gold respectively. They also contained anomalous amounts of tin, suggesting that cassiterite is present. This placer deposit is at an elevation of 150 to 175 feet, suggesting that it may have been influenced by Quaternary sea-level changes during its development.

Bedrock of the Sledge Creek drainage is mostly chloritic and calcareous schist. One or more branches of the Rodine fault parallel upper Sledge Creek (Bundtzen and others, 1994). At least some of the placer gold in Sledge Creek was probably derived from erosion of the Alpha Ridge deposit (NM171).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Drift mining reported in 1916; small open-cut surface mining on and below U.S. Mineral Survey No. 1343 probably took place in about 1925 (Heiner and Porter, 1972).

Production notes:**Reserves:**

Sledge Creek could contain a largely unmined placer deposit (C.C. Hawley, personal observation, 1994, 2000).

Additional comments:**References:**

Mertie, 1918 (B 662-D); Thorne and others, 1948; Heiner and Porter, 1972; Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (Sledge Creek)**Site type:** Occurrence**ARDF no.:** NM170**Latitude:** 64.6340**Quadrangle:** NM C-2**Longitude:** 165.5105**Location description and accuracy:**

Sledge Creek is a west tributary to Snake River; this location is on the ridge crest south of Sledge Creek at an elevation of about 420 feet and about 700 feet upslope of a water ditch. A quartz-feldspar vein and nearby prospect pits are present. It is in the east-central part of section 6, T. 10 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Limonite**Gangue minerals:** Feldspar, quartz**Geologic description:**

Quartz-feldspar veins crop out south of Sledge Creek just upstream of where Sledge Creek enters onto the Snake River valley and about 700 feet upslope from a water ditch. This occurrence appears to be similar to a quartz-feldspar vein described by Cathcart on the north side of Sledge Creek (Cathcart, 1922, p. 249, figure 19, location 2), who also identified feldspar at the occurrence on the north side of Sledge Creek as orthoclase, probably because of its nearly euhedral platy form. The feldspar is probably albite or a sodic oligoclase similar to the platy feldspar found abundantly at the Alpha Ridge prospect (NM171) about a half mile south of this occurrence. Sulfides were not observed by Cathcart, but the vein was iron-stained. Similar nearby quartz-feldspar veins are gold bearing.

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; cross cuts metamorphic rocks of that age.

Deposit model:

Low-sulfide Au-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 veins were explored by shallow pits, some of which were excavated before Cathcart's visit in 1920.

Production notes:**Reserves:****Additional comments:****References:**

Cathcart, 1922.

Primary reference: Cathcart, 1922**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Alpha Ridge**Site type:** Prospect**ARDF no.:** NM171**Latitude:** 64.6267**Quadrangle:** NM C-2**Longitude:** 165.5198**Location description and accuracy:**

The prospect is on the ridge between Alpha Creek (in the Nome C-1 quadrangle) and Sledge Creek, west tributaries to Snake River. Mineralization extends along the ridge for at least 1,000 feet between elevations of about 800 and 1,050 feet. The location is at the most intensely mineralized part of the prospect at an elevation of about 1,000 feet on the ridge and in the NW1/4 section 17, T. 10 S., R. 34 W., Kateel River Meridian. It is accurate within about 500 feet.

Commodities:**Main:** Au**Other:** Ag, As, Pb, Sb, Zn**Ore minerals:** Arsenopyrite, galena, gold (?), sphalerite, stibnite**Gangue minerals:** Albite, ankerite, quartz**Geologic description:**

The Alpha Ridge prospect is an old prospect but its location was first reported by Sainsbury and others (1972 [OFR 72-321]). It was explored by Kennecott Exploration Company from 1990 to 1993. A series of soil samples collected in a reconnaissance survey were anomalous in arsenic, gold, and other elements. The reconnaissance survey was followed up with a detailed soil geochemical survey and trenching; about 1,000 feet of trenches were excavated with a trackhoe.

Mineralization at the site is associated with highly albitized, arsenic-rich rocks and with massive quartz veins; the mineralization appears to be crudely stratabound (C.C. Hawley, Cindy Buxton, and D.L. Olson, written communication, 1992). The most intense mineralization is in an area about 300 by 300 feet on the crest of the ridge immediately below a saddle at an elevation of 1,040 feet. This saddle coincides with a high-angle fault of nearly east-west strike. To the east this fault trends toward the head of the placer gold deposit on Alpha Creek (NM196) in the Nome C-1 quadrangle.

Maximum gold content found in the trench samples was 2,200 ppb; numerous samples contained more than 500 ppb gold and more than 10,000 ppm arsenic. Lead and zinc are also locally strongly enriched. The highest lead and zinc contents are associated with a

massive, west-northwest-striking quartz vein that is exposed in a trench and in rubble about 300 feet north of the fault-controlled saddle. Lead values in galena and possibly as an oxidized mineral, are as high as 5,000 ppm in rock samples. Zinc, inferred to originally have been in sphalerite, is as high as 580 ppm. Antimony is consistently anomalous in the trench samples. The highest antimony value, 370 ppm, coincides with a gold value of 2,900 ppb.

Although the main area of mineralization is below the strong fault which underlies the saddle at the south end of the prospect, areas of albitized rock with quartz float exist at least 1,000 feet north of the area of most intense mineralization. Grab samples from outlying areas locally contain more than 9,000 ppb gold. The auriferous area on Alpha Ridge almost certainly contributed placer gold to Sledge Creek (NM169), as well as to the Alpha Creek placer (NM196) in the Nome C-1 quadrangle.

The prospect is near the crest of a major antiform, and country rock is the calcareous metaturbidite schist unit of Bundtzen and others (1994).

Alteration:

Albitization associated with the introduction of arsenopyrite and other metallic minerals in schist.

Age of mineralization:

Mid-Cretaceous; postdates regional metamorphism and may be similar in age to low-sulfide Au-quartz veins of the Nome district (see, for example, the Divide prospect, NM058).

Deposit model:

Low-sulfide Au-quartz veins ? (Cox and Singer, 1986; model 36a).

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

36a?

Production Status: None**Site Status:** Probably inactive**Workings/exploration:**

About 1000 feet of trenches was excavated in 1991. An extensive soil geochemistry survey, part of a grid that extended from Monument Creek to Bangor Creek, was also completed between 1991 and 1993 by Kennecott Exploration Company. The prospect was probably originally located before 1920.

Production notes:**Reserves:****Additional comments:**

References:

Sainsbury and others, 1972 (OFR 72-321); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Monument Creek; Poorman Bench**Site type:** Mine**ARDF no.:** NM172**Latitude:** 64.5969**Quadrangle:** NM C-2**Longitude:** 165.5108**Location description and accuracy:**

Monument Creek is a west tributary to Snake River; this location is 2.2 miles north-northwest from the bridge on the Nome-Teller road that crosses Snake River. Monument Creek and an adjacent north-side bench were mined extensively in the Nome C-2 quadrangle and downstream into the Nome C-1 quadrangle. This location is the approximate mid-point of placer tailings along the creek and is directly south of the Poorman bench open cut. This is locality 100 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); it is accurate to within about 1,000 feet.

Commodities:**Main:** Au**Other:** Ag, Sn**Ore minerals:** Cassiterite, gold**Gangue minerals:****Geologic description:**

The placer deposit on Monument Creek was apparently discovered after the discovery of a rich, shallow bench, called the Poorman bench, on the north side of the creek. The pay streak on the bench was discovered in 1918 and mined immediately; it was about 40 feet wide, 4 feet thick, and below 6 feet of overburden. The pay gravels contained about 1.5 ounces of gold per cubic yard (Martin, 1920, p. 51; Cathcart, 1920, p. 188-190). The main period of mining in Monument Creek itself was from 1928 until 1940; a bucket line dredge mined in 1938-39 in the upper part of Monument Creek below the two upper forks. The upper north tributary to Monument Creek is auriferous; Kennecott Exploration Company (written communication, 1992) found 7 ppm of gold in a pan concentrate collected about one-half mile above the junction of the upper forks. Anderson (1947) reported cassiterite from Monument Creek. Anomalous amounts of tin are also present a few miles to the north in Sledge Creek (NM169). The proximity to the Nome coastal plain and the low elevation of the site (about 250 feet) suggest that Quaternary sea-level fluctuations could have influenced its development.

The source of placer gold in Monument Creek is unknown. Bedrock in the drainage in-

cludes metaturbidite schist inferred to be the oldest part of the Nome Group (Bundtzen and others, 1994). The Rodine fault, which is mineralized elsewhere (for example, at NM165), cuts across the head of Monument Creek.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Probably inactive

Workings/exploration:

Gold was discovered in a shallow bench north of Monument Creek in about 1918 (Martin, 1920; Cathcart, 1920). The deposit was rich but small and quickly worked out. Monument Creek itself was worked continuously from 1928 to 1935 by mechanical methods and by a dredge in 1938-39. Production is unknown but is believed to be at least in the tens of thousands of ounces because of the long duration of moderate-scale mining. Activity was reported in 1928 (Smith, 1930, p. 39), 1929 (Smith, 1932, p. 44), 1930 (Smith, 1933 [B 836-A, p. 45-46]), 1931 (Smith, 1933 [B 844-A, p. 46]), 1932 (Smith, 1934 [B 857-A, p. 43]), 1933 (Smith, 1934 [B 869-A, p. 48]), 1934 (Smith, 1936, p. 49-50), and 1935 (Smith, 1937, p. 52). Mining activity is not reported for 1936-37, perhaps in anticipation of the dredge that was brought from the Casadepaga River in 1938. The dredged ground was worked out in 1939 (Smith, 1939, p. 63, 75-76, Smith, 1941, p. 59-60, 70).

Production notes:

A few tens of thousands of ounces of gold may have been produced from Monument Creek.

Reserves:**Additional comments:****References:**

Martin, 1920; Cathcart, 1920; Smith, 1930 (B 813-A); Smith, 1932 (B 824-A); Smith, 1933 (B 836-A); Smith, 1933 (B 844-A); Smith, 1934 (B 857-A); Smith, 1934 (B 864-A); Smith, 1936; Smith, 1937; Smith, 1939; Smith, 1941; Anderson, 1947; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Martin, 1920

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Sunset Creek**Site type:** Mine**ARDF no.:** NM173**Latitude:** 64.6025**Quadrangle:** NM C-2**Longitude:** 165.5607**Location description and accuracy:**

Sunset Creek is a northwest tributary to lower Snake River. Patented mining claims are present along Sunset Creek from an elevation of about 250 feet downstream for about 3 miles to Snake River; the coordinates are about the center of the area that was mined. A dredge cut immediately south of the Nome-Teller road at an elevation of about 100 feet probably develops an ancient beach approximately equivalent to Third Beach that is extensively developed in the Nome C-1 quadrangle. The location is accurate within about 500 feet. This is locality 79 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

This is probably a complex placer deposit developed, in part, by beach reworking of gold-bearing alluvium on the edge of the coastal plain where it is cut by Sunset Creek. The deposit was correlated with Third Beach deposits by 1907 (Smith, 1908, p. 214). The mine was operated on a small scale until 1934 when a dredge was brought here from Osborn Creek. The dredge began to operate late in the 1934 season and operated continuously into a short season in 1939.

The upper part of Sunset Creek flows southeasterly through the metaturbidite schist unit of Bundtzen and others (1994). Sunset Creek is the southernmost of a series of gold-bearing creeks that flow east to the Snake River valley. The others include Monument ((NM172), Sledge, (NM169), and Boulder (NM168) Creeks.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au and beach placers (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Early small-scale workings occurred in 1907 (Smith, 1908) and 1924 (Smith, 1926). A dredge was moved here from Osborn Creek, and the deposit was mined from 1934 to 1939 (Cobb, 1978 [OFR 78-93]).

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Smith, 1926; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Smith, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Dakota**Site type:** Prospect**ARDF no.:** NM174**Latitude:** 64.6482**Quadrangle:** NM C-2**Longitude:** 165.5042**Location description and accuracy:**

The Dakota prospect is probably on the north side of Boulder Creek about a quarter of a mile below its confluence with Twin Mountain Creek (shown as Twin Mtn Ck on the map) which joins it from the north. Mertie (1918 [B 662-I, p. 425-449]) reported a 35-foot-long adit driven into marble on the Dakota claim, one of a group of 13 claims in this area at the time. The location is accurate to within about 1,000 feet. Information for this prospect was summarized by Cobb (1978 [OFR 78-93]) under the name 'Dakota'.

Commodities:**Main:** Au (?)**Other:** Sb, W**Ore minerals:** Gold (?), scheelite (?), stibnite (?)**Gangue minerals:** Calcite, quartz**Geologic description:**

The location is at a bold outcrop of marble about a quarter mile below Twin Mountain Creek (shown as Ttwin Mtn Ck on the map) on the north side of Boulder Creek. At this site, a short adit is driven into apparently barren marble. Strongly ankeritized rock is evident nearby in placer tailings. A few small quartz veins that strike north-northeast occur in the bluffs on the south side of Boulder Creek, opposite the short adit. Mertie (1918 [B 662-I, p. 425-449]) reported a 35-foot-long adit and quartz-calcite veins in marble with practically no sulfides at the Dakota prospect. Alaska claim files (Heiner and Porter, 1972, Kardex site Kx 52-105) list 16 Dakota claims staked for gold, antimony, and tungsten by W. Cochrane in about 1900. It is possible that better mineralization was exposed but is now buried by placer tailings. Gold-bearing bedrock mineralization (NM167) was found on the bench north of the Dakota prospect by Kennecott Exploration Company in 1992 and 1993.

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:**

A short adit was driven before 1916; claim activity dates back to 1900 (Heiner and Porter, 1972).

Production notes:**Reserves:****Additional comments:****References:**

Mertie, 1918 (B 662-I); Heiner and Porter, 1972; Cobb, 1978 (OFR 78-93).

Primary reference: Mertie, 1918**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Unnamed (west of Sunset Creek)

Site type: Prospect

ARDF no.: NM175

Latitude: 64.6161

Quadrangle: NM C-2

Longitude: 165.5862

Location description and accuracy:

This prospect is a large block of patented claims (U.S. Mineral Survey No. 1320) about 2.5 miles long, generally oriented easterly and almost 1 mile wide. The claim block extends north into the foothills but is mostly on the upper coastal plain west of Sunset Creek (NM173). The block is inferred to be located on an intermediate and unnamed buried beach deposit on the coastal plain. The location used here is the approximate center of the claim block.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

This prospect is a large block of patented claims (U.S. Mineral Survey No. 1320) about 2.5 miles long, generally oriented easterly and almost 1 mile wide. The claim block extends north into the foothills but is mostly on the upper coastal plain, west of Sunset Creek (NM173). The block is inferred to be located on an intermediate and unnamed buried beach deposit on the coastal plain.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Buried beach placer?

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

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

The claims were sufficiently explored to obtain patent (U.S. Mineral Survey No. 1320) on a large block. They are not known to have been developed. The claims predate 1925 because they appear on a Hammon Consolidated Goldfields map of that date.

Production notes:

Reserves:

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): May Gulch**Site type:** Mine**ARDF no.:** NM176**Latitude:** 64.6561**Quadrangle:** NM C-2**Longitude:** 165.6670**Location description and accuracy:**

May Gulch is the southern headwater tributary of Hungry Creek (NM149). Hungry Creek is an east tributary of Oregon Creek. The mouth of Hungry Creek is three quarters of a mile upstream from the junction of Oregon Creek and Cripple River at the Nome-Teller road. The location is the same as locality 77 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). Its location is accurate to within about 1,000 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Collier and others (1908, p. 215) reported that prospect holes sunk 20 feet into washed gravel found small gold flecks throughout the gravel. The prospect holes did not encounter bedrock. Bundtzen and others (1994) mapped some placer tailings in the lower part of May Gulch; bedrock was not exposed here, but it is probably chlorite-rich metaturbite graphitic schist (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Some 20-foot-deep prospect pits were reported to have been dug in upper May Gulch before 1908 (Collier and others, 1908); placer tailings were mapped in lower May Gulch by Bundtzen and others (1994).

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Trilby Creek**Site type:** Mine**ARDF no.:** NM177**Latitude:** 64.6689**Quadrangle:** NM C-2**Longitude:** 165.6911**Location description and accuracy:**

Trilby Creek is a northern tributary to Hungry Creek, about 1 mile upstream from the junction of Hungry Creek and Oregon Creek. Trilby Creek is not named on current topographic maps of the area. The mouth of Hungry Creek is about 4,000 feet upstream from the confluence of Oregon Creek and Cripple River at the Nome-Teller road. The location, probably accurate within a half mile, is essentially the same as locality 75 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Trilby Creek produced about 250 ounces of gold (5,000 dollars) before 1903 from a placer on the north side of Hungry Creek. When the area was visited by the U.S. Geological Survey in 1903, there had been no development work that year because of the dryness of the season (Collier and others, 1908, p. 215). The placer reportedly was developed in alluvial material. The location is uncertain, but Trilby Creek could overlie parts of the Aurora fault of Bundtzen and others (1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Surface workings and some production took place about 1900.

Production notes:

About 250 ounces of gold were produced before 1903.

Reserves:

Additional comments:

References:

Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Second Beach (near the mouth of Cripple River)

Site type: Mine

ARDF no.: NM178

Latitude: 64.6258

Quadrangle: NM C-2

Longitude: 165.7889

Location description and accuracy:

A placer mine near the mouth of Cripple River was reported by Sainsbury and others (1972 [OFR 72-321]). The location is on the west side of Cripple River, about 1,500 feet inland from the mouth. The site, inferred to be on the so called Second Beach, is located within about a third of a mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

A placer mine near the mouth of Cripple River was reported by Sainsbury and others (1972 [OFR 72-321]). The location is on the west side of Cripple River, about 1,500 feet inland from the mouth. It is inferred to be on a westward extension of Second Beach that was mined at many places on the coastal plain to the east. Second Beach deposits were originally marked by a moss-covered gravel escarpment about 35 feet above modern sea level. It contains quartz sand deposits with driftwood, fragments of walrus tusks, and marine shells (Collier and others, 1908; Moffitt, 1906, 1907). There was more garnet in Second Beach deposits than in those of Third Beach. Second Beach is commonly buried by a few feet of material that is commonly frozen. The raised beach deposit is essentially at the landward limit of the Pelukian marine transgression mapped by Bundtzen and others (1994). The amount of production is unknown at this site.

Alteration:

Age of mineralization:

Late Pleistocene.

Deposit model:

Beach placer Au.

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

Production Status: Yes; small

Site Status: Probably inactive

Workings/exploration:

Some surface workings or dumps from drifting must be present.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1906; Moffit, 1907; Collier and others, 1908; Sainsbury and others, 1972 (OFR 72-321); Bundtzen and others, 1994.

Primary reference: Sainsbury and others, 1972 (OFR 72-321)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Second Beach (east of Penny River); Jess Creek

Site type: Mine

ARDF no.: NM179

Latitude: 64.6366

Quadrangle: NM C-2

Longitude: 165.6734

Location description and accuracy:

This site is a linear beach placer about 3 miles long that extends east from the mouth of Penny River. It is, in part, known as Jess Creek (Collier and others, 1908). The location is the approximate mid-point of the placer; it is about a third of a mile north of the present beach. These are localities 134 and 135 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

A gold deposit at Jess Creek (not named on current U.S. Geological Survey topographic maps), which enters Norton Sound east of the mouth of Penny River, was correlated with Second Beach deposits (Collier and others, 1908, figure 9; Moffit, 1907, p. 134-144). This appears to part of the 3 miles of Second Beach placer deposits mapped by Sainsbury and others (1972 [OFR 72-321]) in this area. Second Beach deposits are at an elevation of about 35 feet above the modern beach and consist of quartz sand with drift wood, fragments of walrus tusks, and marine shells. Garnet sand was relatively abundant in pay sections that generally were developed on unconsolidated deposits. Second Beach deposits approximately mark the landward limit of the Pelukian marine transgression mapped by Bundtzen and others (1994).

Alteration:

Age of mineralization:

Late Pleistocene.

Deposit model:

Auriferous beach placer.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** Yes; small**Site Status:** Probably inactive**Workings/exploration:**

The Jess Creek site was known at least by 1905 and was developed for mining before 1908 (Collier and others, 1908); State files show various claim groups along Second Beach at and east of Penny River (Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1907; Collier and others, 1908; Heiner and Porter, 1972; Sainsbury and others, 1972 (OFR 72-321); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Moffit, 1907**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 3/12/2000

Site name(s): Penny River**Site type:** Mine**ARDF no.:** NM180**Latitude:** 64.6241**Quadrangle:** NM C-2**Longitude:** 165.7059**Location description and accuracy:**

A placer mine was shown by Sainsbury and others (1972 [OFR 72-321]) on the east side of Penny River 1.3 miles upstream from its mouth; it is in the SE1/4 section 8, T. 10. S., R. 35 W., Kateel River Meridian. The site is located within about 1,000 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

A placer mine was shown by Sainsbury and others (1972 [OFR 72-321]) on the east side of Penny River 1.3 miles upstream from its mouth. It is not known if this placer is in the Penny River alluvium or if it is associated with raised beach deposits of the coastal plain.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au; alluvial or beach placer (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined**Site Status:** Probably inactive

Workings/exploration:

Surface placer mine workings or shaft dumps are probably present at the site.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury and others, 1972 (OFR 72-321).

Primary reference: Sainsbury and others, 1972 (OFR 72-321)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (east of lower Penny River)

Site type: Mine

ARDF no.: NM181

Latitude: 64.6293

Quadrangle: NM C-2

Longitude: 165.6537

Location description and accuracy:

A gold placer mine was mapped at this locality by Sainsbury and others (1972 [OFR 72-321]). It is shown as a linear trend of workings about one-half mile long and oriented northwest. It trends across the nose of a low hill at an elevation of about 110 feet. It is 0.9 miles north of the present coastline of Norton Sound and 2.6 miles northeast of the mouth of Penny River. The location used here is about the mid-point of the placer and is accurate to within 1,000 feet.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Sainsbury and others (1972 [OFR 72-321]) mapped a linear trend of placer workings about one-half mile long that trends northwest at an elevation of about 110 feet across the nose of a low north-trending hill. The low hill probably marks a bedrock ridge that was eroded during Quaternary sea-level transgressions across the coastal plain. The position and elevation of these workings suggest that they are correlative with the beach placer at Sunset Creek (NM173) about 3.3 miles to the northeast. This beach placer is probably part of the Third Beach system of the Nome coastal plain as concluded by Sainsbury and others (1972 [OFR 72-321]). It could also be an unnamed intermediate beach deposit.

Alteration:

Age of mineralization:

Late Pleistocene.

Deposit model:

Beach placer Au.

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

Production Status: Undetermined.

Site Status: Inactive

Workings/exploration:

Surface workings are present at the site.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury and others, 1972 (OFR 72-321).

Primary reference: Sainsbury and others, 1972 (OFR 72-321)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Snake River (lower)**Site type:** Mine**ARDF no.:** NM182**Latitude:** 64.6451**Quadrangle:** NM C-2**Longitude:** 165.5531**Location description and accuracy:**

A placer gold mine was reported on the south bank of lower Snake River (Sainsbury and others, 1972 [OFR 72-321]). It is in the NW1/4 section 19, T. 11 S., R. 34 W., Kateel River Meridian and about 0.8 miles north of the present coastline of Norton Sound. The location is accurate within about 1,000 feet. This portion of Snake River is within U.S. Mineral Survey No. 1848, a patented claim group that extends westerly, possibly along actual or inferred raised beach deposits.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The entire Snake River drainage south of Last Chance Creek in the Nome C-1 quadrangle was reported as auriferous by Collier and others (1908) but not in economic quantities. This site, reported as a mine by Sainsbury and others (1972 [OFR 72-321]), was located as early as 1925, probably for Hammon Consolidated Goldfields. The claims here were patented in U.S. Mineral Survey No. 1846. This placer could include raised beach placers as well as a segment of the Snake River flood plain that reworked placer deposits of the coastal plain.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

Production Status: Undetermined.

Site Status: Probably inactive

Workings/exploration:

Mining claims on lower Snake River were probably located for Hammon Consolidated Goldfields by 1925. Sainsbury and others (1972 [OFR 72-321]) reported a mine here, probably based on aerial observation of tailings.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Sainsbury and others, 1972 (OFR 72-321).

Primary reference: Sainsbury and others, 1972 (OFR 72-321)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Unnamed (north of Boulder Creek; near hill 1293)

Site type: Occurrence

ARDF no.: NM183

Latitude: 64.6634

Quadrangle: NM C-2

Longitude: 165.5169

Location description and accuracy:

The occurrence is about 500 feet south-southwest of hill 1293 near the center of section 32, T. 9 S., R. 34 W., Kateel River Meridian. It is on the ridge crest about a half-mile north of Twin Mountain Creek (shown as Twin Mtn Ck on the map). The location is accurate within about 500 feet.

Commodities:

Main: Au

Other: As, Pb, Zn

Ore minerals: Arsenopyrite

Gangue minerals: Albite, quartz

Geologic description:

Mineralized schist crops out south of hill 1293 on the ridge crest northwest of the Twin Mountain Creek prospect (NM166). The occurrence was found as a result of a soil geochemistry survey of the Boulder-Twin Mountain Creek area by Kennecott Exploration Company in 1992. The soil survey grid consisted of north-trending lines 1,000 feet apart and east-trending lines 2,000 feet apart. Soils were collected on 200-foot centers (Hawley Resource Group for Kennecott Exploration Company, written communication, 1992). Soils near this occurrence were strongly anomalous in gold, arsenic, lead, and zinc. Rock samples at the occurrence contained as much as 0.1 ounce of gold per ton and more than 1 percent arsenic. The occurrence is within an area about 400 by 400 feet where soils contain as much as 780 ppm lead, 580 ppm zinc, more than 1,000 ppm arsenic, and more than 100 ppb gold. The occurrence is in an anomalous area along the Twin Mountain-Rodine fault. Country rock at the site is west-dipping calcareous metaturbidite (Bundtzen and others, 1994). The site is moderately oxidized. Galena and sphalerite were not found but probably were present before oxidation.

Alteration:

Sulfidation and albitization of schist near the occurrence.

Age of mineralization:

Mid-Cretaceous; postdates regional metamorphism and may be similar in age to low-sulfide gold-quartz veins of the Nome district (see, for example, the Divide prospect, NM058).

Deposit model:

Low-sulfide Au-quartz veins? (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 occurrence was found during follow-up of a soil geochemistry survey conducted for Kennecott Exploration Company in 1992.

Production notes:

Reserves:

Additional comments:

References:

Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Penny River**Site type:** Prospects**ARDF no.:** NM184**Latitude:** 64.5906**Quadrangle:** NM C-2**Longitude:** 165.6566**Location description and accuracy:**

This prospect consists of patented mining claims along Penny River. They extend about 1.5 miles upstream and about 2.5 miles downstream from the mouth of Willow Creek (NM162). The mouth of Willow Creek is 500 feet downstream from where the Nome-Teller road crosses Penny River. The location is the approximate mid-point of the patented claims.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Penny River parallels or follows the Penny River fault over most of its length (Bundtzen and others, 1994), and several mineralized areas are present along or near this fault. Although patented mining claims exist along this part of Penny River, there is no evidence of significant mining. It is assumed that gold on Penny River is fine grained and only locally concentrated in point bar and other river deposits. Early claims were staked on the Penny River by the Pioneer Mining Company and later transferred to the F.E. Company (Heiner and Porter, 1972). A map of Hammon Consolidated Goldfields of about 1925 also shows mining claim activity along Penny River.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Mining claims were staked in 1913 by Pioneer Mining Company and later assigned to the F.E. Company. The claims were active from 1913 until 1978 (Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). There is no record of significant mining.

Production notes:

Reserves:

Additional comments:

References:

Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Russel Creek**Site type:** Prospect**ARDF no.:** NM185**Latitude:** 64.5936**Quadrangle:** NM C-2**Longitude:** 165.5129**Location description and accuracy:**

One patented claim is reported on Russel Creek, the creek that enters the west side of Snake River between Monument Creek (NM172) and Sunset Creek (NM173). The location is the approximate center of the patented claim, 0.9 mile north-northwest from where the Nome-Teller road crosses Snake River.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Russel Creek is a short and fairly steep creek between Monument Creek (NM172) and Sunset Creek (NM173), west tributaries to Snake River. One claim was located and patented (U.S. Mineral Survey No. 757) where the stream gradient decreases to approximate that of the Snake River valley. It is at an elevation of about 75 feet; placer deposit development here could have been influenced by Quaternary sea-level changes and related coastal processes.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986, model 39a).

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

39a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

Russel Creek was reported as being named by a prospector in 1900 (Orth, 1967).

References:

Orth, 1967.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 3/12/2000

Site name(s): Twin Mountain**Site type:** Prospect**ARDF no.:** NM186**Latitude:** 64.6769**Quadrangle:** NM C-1**Longitude:** 165.4948**Location description and accuracy:**

The Twin Mountain prospect is at an elevation of 1,000 feet on the western headwater slope of Twin Mountains Creek valley, due west of the headwater drainage of Twin Mountains Creek. The prospect is about 700 feet south of hill 1134, in the SW1/4 section 28, T. 9 S., R. 34 W, Kateel River Meridian. The location is accurate within about 250 feet.

Commodities:**Main:** Ag, Au, Pb, Zn**Other:****Ore minerals:** Arsenopyrite, boulangerite, galena, gold (?), hematite, limonite, pyrite, sphalerite**Gangue minerals:** Albite, ankerite, quartz**Geologic description:**

Mineral deposits at Twin Mountain consist of nearly stratabound zones of sulfidized schist flanked to the north by zones of nearly horizontal white quartz veins. In plan, the deposit is at least 700 feet long, as much as 120 feet across in a north-south direction, and elongated about N 80-85 E. Drilling suggests that the zone is about 100 feet thick. Two other small deposits occur nearby. One is 25 by 50 feet in plan and 200 feet north of the west end of the main deposit. The other, also about 25 feet across, is about 300 feet east-northeast of the east end of the main deposit.

The sulfidized schist probably originally contained 5 to 10 percent arsenopyrite and pyrite, now mostly oxidized to hematite and limonite. Knots of almost massive sulfide occur locally in the schist. These knots are about 6 inches across and contain as much as several percent boulangerite, galena, sphalerite, pyrite, and arsenopyrite. Quartz is sparse in the sulfidized schist, but shallow-dipping quartz veins as much as 4 feet thick occur in the silicified zone adjacent to the metalliferous schist. The quartz is massive, white to creamy white, and generally contains 1 to 2 percent pyrite, arsenopyrite, and galena. Quartz veins appear to be partly controlled by tight recumbent folds.

The prospect was found by following up a soil geochemical survey by Kennecott Explo-

ration Company in 1992 and 1993. The soil survey extended northerly from Monument Creek to Bangor Creek, a distance of about 6.5 miles, and was about 1 mile across. Soil samples collected in upper Twin Mountains Creek contained as much as 8,200 ppb gold and more than 8,000 ppm arsenic. The deposit is within a soil anomaly defined by greater than 100 ppb gold; the anomalous area is about 3,600 feet long, elongated west-northwest, and about 800 feet across. The gold-in-soil anomaly is within an arsenic soil anomaly defined by greater than 400 ppm arsenic. The anomalous area was soil covered; the only obvious unusual features were local concentrations of quartz boulders and an unusual abundance of poppies. Poppies were abundant enough that the anomalous area was called the Poppy anomaly.

The area was explored in 1993 by about 3,600 feet of backhoe trenches that ranged from 5 to almost 10 feet deep. The trenching exposed parts of three deposits. The main deposit was exposed in eight north-northeast-trending trenches and one north-northwest-trending trench through the strongest part of the deposit. Sulfidized schist mostly contains 1,500 ppb gold (0.04 ounce of gold per ton) and as much as 0.23 ounce of gold per ton. The quartz-veined zone mostly contains 200 to 600 ppb gold and as much as 0.18 ounce of gold per ton. Sulfide knots rich in galena and boulangerite contain as much as 15 ounces of silver per ton. A few reverse circulation holes drilled in 1994 and 1995 confirmed grades of a few hundredths ounce of gold per ton and appear to confirm a nearly stratabound occurrence localized by shallow-dipping schistosity and fold axes. The deposits at Twin Mountain are similar to those at Alpha Ridge (NM171) and Goodluck Gulch (NM202). Quartz, sulfide minerals, albite, and ankerite were introduced here in a ductile environment relatively early in the main period of gold deposition in the Nome district.

The Twin Mountain deposit is confined to a lithologic sequence less than 100 feet thick of weakly graphitic mica-schist. Graphitic quartz schist crops out south of the prospect, and a calc-mica schist unit occurs from 700 to 1,000 feet south of the prospect. These units are tentatively correlated with the 'mixed unit' schist of Till and others (1986). The prospect is about 250 feet south of and subparallel to an open antiform that trends nearly east-west. The deposit and antiform appear to be cut off to the east and north by a major thrust (?) fault that strikes west-northwest. The thrust (?) fault and mineralized rocks in turn abut against and are probably cut off by the major Rodine fault, which is about one-half mile southeast of the prospect (Bundtzen and others, 1994). Rocks that underlie hill 1134 north of the prospect are highly contorted pelitic calc-schist that could correlate with apparently older Solomon Schist units which generally underlie the Mixed Unit schist of Till and others (1986). The highly contorted schist is on the hanging wall of the thrust (?) fault that cuts off the deposit.

Alteration:

Silicification, albitization, and some introduction of ankerite.

Age of mineralization:

Protolith ages of the enclosing schist is probably early Paleozoic (Till and others, 1986; Till and Dumoulin, 1994). Some fissure-controlled gold quartz veins on the Seward Peninsula formed at about 109 Ma (Ford and Snee, 1996), but more age determinations are needed to bracket the gold-mineralizing event near Nome.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a); massive quartz-sulfide masses in schist.

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

36a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The prospect was found by following up a major soil geochemical survey by Kennecott Exploration Company mainly in 1992 and 1993. The soil survey extended northerly from Monument Creek to Bangor Creek, a distance of about 6.5 miles, and was about 1 mile across. Soil samples collected in upper Twin Mountains Creek contained as much as 8,200 ppb gold and more than 8,000 ppm arsenic. The anomalous area was soil covered; the only obvious unusual features were local concentrations of quartz and an abundance of poppies. Poppies were abundant enough that the anomalous area was called the Poppy anomaly.

In 1993, the area was prospected by about 3,600 feet of backhoe trenches that disclosed a main zone containing quartz veins as much as 4 feet thick within strongly albitized and sulfidized schist. Shallow holes drilled in 1994 show that the deposit is thin and dips at a shallow angle.

Production notes:

Reserves:

Additional comments:

The Twin Mountain deposit is similar to those at Alpha Ridge (NM171) and Goodluck Gulch (NM202).

References:

Till and others, 1986; Bundtzen and others, 1994; Till and Dumoulin, 1994; Ford and Snee, 1996.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (west side of Twin Mountain Creek)

Site type: Prospect

ARDF no.: NM187

Latitude: 64.6713

Quadrangle: NM C-1

Longitude: 165.4996

Location description and accuracy:

This prospect is at an elevation of about 1,000 feet on the west slope of Twin Mountains Creek valley, due west of the central part of Twin Mountain Creek. The prospect is in the NW1/4NW 1/4 section 33, T. 9 S., R. 34 W., Kateel River Meridian. The vein at this prospect extends westward into the Nome C-2 quadrangle. The location is accurate within about a half mile.

Commodities:

Main: Sb

Other: Ag, Au, Pb

Ore minerals: Galena, gold (?), stibnite

Gangue minerals: Quartz

Geologic description:

This prospect is on a simple quartz vein, as much as 3 feet thick and 600 feet long, that strikes northwest and dips steeply. It cuts across the schistosity of the host micaceous calc-schist. The vein contains as much as several percent of stibnite and galena. It is within a major geochemical soil anomaly characterized by gold, arsenic, and lead, that extends from the Rodine prospect (NM165) to Bangor Creek north of the Twin Mountain prospect (NM186).

Alteration:

Age of mineralization:

Mid-Cretaceous or younger; vein crosscuts rocks regionally metamorphosed in the mid-Cretaceous.

Deposit model:

Simple Sb deposit (Cox and Singer, 1986; model 27d).

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

Production Status: None

Site Status: Inactive

Workings/exploration:

The vein can be traced in outcrop or by float for a distance of about 600 feet.

Production notes:

Reserves:

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Ruby and Golconda**Site type:** Prospect**ARDF no.:** NM188**Latitude:** 64.6814**Quadrangle:** NM C-1**Longitude:** 165.4832**Location description and accuracy:**

This prospect is at an elevation of about 900 feet on the divide between the headwaters of Twin Mountains Creek and Butterfield Canyon. The prospect is about one-quarter mile northwest of the Lilly prospect (NM189). The location is near the center of section 28, T. 9 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Cu**Other:****Ore minerals:** Azurite, chalcopyrite, limonite, malachite**Gangue minerals:** Quartz**Geologic description:**

Mertie (1918 [B 622-I, p. 442]) reported azurite and malachite in fractured quartz on the Ruby and Golconda claims at the head of Twin Mountains Creek. A copper-bearing quartz vein located by Kennecott Exploration Company at the head of Twin Mountain Creek in 1993 is assumed to be the vein described by Mertie. Hummel (1962 [MF 247, locality 9]) reported copper at the nearby Lilly prospect (NM189) but he may have confused the Lilly and Ruby and Golconda prospects because the Lilly deposit apparently does not contain copper (C.C. Hawley, unpub. data, 1993).

The Ruby and Golconda deposit is a concordant quartz vein about 2 feet thick. The vein is coated with limonite and contains less than 2 percent malachite and azurite as fracture coatings and about 1 percent disseminated chalcopyrite in grains less than 0.2 inch across. The quartz strongly resembles limonite-stained sugary quartz boulders found throughout the western part of the Nome district, most commonly in stream float. Such boulders contain sparsely disseminated chalcopyrite and few other sulfide minerals. The concordant nature of the quartz vein at Ruby and Golconda and similar occurrences elsewhere suggests that these copper-bearing quartz veins are very early, having formed essentially by metamorphic processes prior to the main gold-mineralizing events at Nome. This early quartz could correlate with the weakly metallized quartz rods at the upper Butterfield Creek deposit (NM164).

Alteration:

Oxidation.

Age of mineralization:

Pre-Late Cretaceous; possibly as old as early Paleozoic, the protolith age of the enclosing metamorphic rocks.

Deposit model:

Concordant copper-bearing quartz vein in schist.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

A short tunnel was reported but was not found by Mertie (1918) or by C.C. Hawley in 1993.

Production notes:**Reserves:****Additional comments:**

Sometimes confused with the nearby Lilly prospect (NM189).

References:

Mertie, 1918 (B 622-I); Hummel, 1962 (MF 247).

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Lilly

Site type: Prospect

ARDF no.: NM189

Latitude: 64.6785

Quadrangle: NM C-1

Longitude: 165.4772

Location description and accuracy:

The Lilly prospect is at an elevation of about 850 feet on the divide between the headwaters of Twin Mountains Creek and Bangor Creek. It is about one-quarter mile south of hill 992, in the NW1/4SE1/4 section 28, T. 9 S., R. 34 W., of the Kateel River Meridian. It was included in locality 36 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect is locality 9 of Hummel (1962 [MF 247]) and it is located to within 500 feet.

Commodities:

Main: Au

Other:

Ore minerals: Arsenopyrite, gold (?), pyrite

Gangue minerals: Ankerite, quartz

Geologic description:

The Lilly prospect consists of pyrite and arsenopyrite in quartz veins and disseminated in silicified graphitic marble and schist near old prospect pits that probably are just east of the Rodine fault (Bundtzen and others, 1994). Soil samples in the area contain as much as 335 ppb gold and 1,650 ppm arsenic. In 1991, Kennecott Exploration Company cut two 2,000-foot-long backhoe trenches aligned north-south extending through the site (C. C. Hawley, Cindy Buxton, and Duane Olson, written communication, 1992). In addition to anomalous soil values near the old prospect, a vein zone that strikes east-northeast was discovered about 2,000 feet to the south. Soils over the vein zone contain more than 600 ppb gold and more than 4,000 ppm arsenic. The zone apparently contains local concentrations of free gold that were mined in a hill-slope placer deposit less than one-half mile southeast of the Lilly area (NM190). The Lilly lode was briefly described by Cathcart (1922, p. 252).

Alteration:

Silicification; introduction of arsenopyrite into schist.

Age of mineralization:

Mid-Cretaceous or younger; postdates mid-Cretaceous regional metamorphism.

Deposit model:

Low-sulfide Au-quartz veins (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:

Exploration includes early 1900's prospect pits and more than 2,000 feet of trenches cut here in 1991 by Kennecott Exploration Company.

Production notes:

Reserves:

Additional comments:

References:

Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (east flank of NorthTwin Mountain)

Site type: Mine

ARDF no.: NM190

Latitude: 64.6750

Quadrangle: NM C-1

Longitude: 165.4651

Location description and accuracy:

This small placer mine is at an elevation of about 350 to 600 feet in the headwaters of an unnamed, east-trending drainage on the northeast flank of Twin Mountain. The site is 2,500 feet northeast of elevation 1140 on Twin Mountain and is located to within 500 feet. It is near the south end of the boundary between sections 27 and 28, T. 9 S., R. 34 W., Kateel River Meridian and downslope from the Lilly lode prospect (NM189).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals: Quartz

Geologic description:

A small hillside placer gold mine was worked by hand methods in the head of a gulch to the east and south of the Lilly lode (NM189). The gulch contains locally derived quartz boulders. Although only low-grade material has been found at the Lilly and nearby prospects, these lodes likely contained some free gold that was the source of the hillside placer.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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 hand workings are present in this gulch below the Lilly prospect.

Production notes:

Reserves:

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Butterfield Canyon**Site type:** Mine**ARDF no.:** NM191**Latitude:** 64.6896**Quadrangle:** NM C-1**Longitude:** 165.4826**Location description and accuracy:**

Butterfield Canyon is a south tributary to Bangor Creek, a west tributary to Snake River. The confluence of Butterfield Canyon and Bangor Creek is about 2.8 miles due west of the Snake River road. The lower 2,000 feet of Butterfield Canyon has been placer mined. The map site is on Butterfield Creek, in the SE1/4 section 21, T. 9 S., R. 34 W., Kateel River Meridian. It is included in locality 92 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The confluence of Butterfield and Bangor Creeks is covered by patented mining claims (U.S. Mineral Survey No. 1844); the plat shows placer workings on both Bangor and Butterfield Creeks.

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, scheelite**Gangue minerals:** Albite**Geologic description:**

Butterfield Creek has been placer mined for approximately 2,000 feet above its confluence with Bangor Creek (NM192). The source of the placer gold appears to be lode deposits at an elevation of 400 to 500 feet southeast of the placer workings. This zone is marked by scattered boulders of white quartz with 1 to 2 percent disseminated galena and a 2,000-foot-long, east-west-oriented soil anomaly containing as much as 895 ppb gold and 3,720 ppm arsenic (Kennecott Exploration Company, written communication, 1993). The anomaly terminates sharply upslope, suggesting an east-west linear source.

The placer deposit appears to have contained sulfidized albite. A small dump on the south side of the creek mainly contains auriferous, iron-stained albite. The dump probably represents either placer clean-up or tailings from a hard-rock mill or arrastre. The presence of auriferous albite suggests that the source of the placer gold is of the albite-rich type like that at Twin Mountain (NM186), Goodluck Gulch (NM202), and Sophie Gulch (NM208). Rocks such as these could have also contributed scheelite that is reported to be abundant in Bangor Creek below its confluence with Butterfield Creek

(Thorne and others, 1948). Most of the mining along Butterfield Creek was probably done around 1900 by shovel-in methods.

Country rock is calcareous metaturbidite schist (Bundtzen and others, 1994). This schist is composed mainly of quartz, calcite, feldspar, mica and opaques. Graphitic quartz schist crops out on the southeast flank of the creek near the upper limit of placer pay.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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:

Butterfield Creek was worked largely by hand methods above its confluence with Bangor Creek. The creek was probably mined mainly before 1930. In 1992, Kennecott Exploration Company mapped the geology and collected soil samples in the area and found an extensive gold anomaly on the flank of Butterfield Creek above the placer mine; this zone is almost certainly part of the source of the pay in Butterfield and Bangor Creeks.

Production notes:

Reserves:

Additional comments:

References:

Thorne and others, 1948; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Bangor Creek

Site type: Mine

ARDF no.: NM192

Latitude: 64.6898

Quadrangle: NM C-1

Longitude: 165.4658

Location description and accuracy:

Bangor Creek is an east-flowing tributary to Snake River; their confluence is about 1.2 miles due west of the Snake River road. About 1.4 miles of Bangor Creek have been placer mined, from an elevation of about 175 feet at the edge of the Snake River flood plain upstream to an elevation of about 300 feet. The map location is at the approximate midpoint of the mined part of Bangor Creek in the southwest corner of section 22, T. 9 S., R. 34 W., Kateel River Meridian. It is included in locality 92 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Ag, W

Ore minerals: Gold, hematite, scheelite

Gangue minerals:

Geologic description:

Bangor Creek was placer mined for about 1,500 feet above its confluence with Butterfield Creek and for more than a mile below the confluence. Mining probably began in Bangor Creek as early as 1906 (Brooks, 1911) and continued to 1914 when a 3.5 foot bucket line dredge was built (Eakin, 1915 [B 622-I, p. 367]). The dredge had a design capacity of 2,000 cubic yards of material per day and reportedly dug down for about 18 feet. Dredge tailings on Bangor Creek contain abundant large cobbles and small boulders of quartz. Before the dredge was constructed, most of the mining was near the confluence of Butterfield Creek. In this area, the grade of the placer was reported to be about 0.12 ounce of gold per cubic yard in a deposit about 14 feet deep. Most of the gold reportedly was fine-grained but some nuggets weighed about 0.75 ounce. Hematite and scheelite were present; some scheelite occurred in pieces weighing one-half pound (Moffit, 1913). Scheelite was also reported by Coats (1944) and Thorne and others (1948). Potential lode sources for the gold and scheelite in Bangor Creek include the mineralized zone on the southeast flank of Butterfield Creek (NM191), possibly the Twin Mountain zone (NM186), and the Jarosa Ridge prospect (NM193). Bangor Creek cuts through rocks ten-

tatively correlated with the Solomon Schist which forms the core of the Twin Mountain anticline (Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes**Site Status:** Inactive**Workings/exploration:**

Bangor Creek was worked by surface or by shallow underground methods from at least 1910 until 1914, when a bucketline dredge was erected on the creek. The grade of the placer reported in Moffit (1913) was 0.12 ounce of gold per cubic yard. The main period of mining apparently was from 1914 until 1918 (Mertie, 1918 [B 622-I, p. 425-449]; Cathcart, 1920). The dredge made at least two parallel passes. The lower limit of pay was just above the point where Bangor Creek enters the Snake River plain.

Production notes:**Reserves:****Additional comments:****References:**

Brooks, 1911; Moffit, 1913; Eakin, 1915 (B 622-I); Mertie, 1918 (B 662-I); Cathcart, 1920; Coats, 1944; Thorne and others, 1948; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Moffit, 1913**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Jarosa Ridge**Site type:** Prospect**ARDF no.:** NM193**Latitude:** 64.7055**Quadrangle:** NM C-1**Longitude:** 165.4853**Location description and accuracy:**

This prospect is at an elevation of about 1,150 feet on the ridge crest trending west from Jarosa Creek valley. Jarosa Creek is a north tributary to Bangor Creek. The map location is in the SW1/4 section 16, T. 9 S., R. 34 W., Kateel River Meridian. The location is accurate to within about 500 feet.

Commodities:**Main:** Au**Other:** As, Sb**Ore minerals:** Arsenopyrite, gold (?), stibnite (?)**Gangue minerals:** Quartz**Geologic description:**

This is an old prospect that has apparently not been previously reported. Workings consist of at least six prospect pits or shallow shafts. A local soil geochemical survey in the 1990's found as much as 990 ppb gold, greater than 10,000 ppm arsenic, and as much as 63 ppm antimony (Kennecott Exploration Company, written communication, 1992). Bedrock in this area was mapped as calc- and chlorite-rich metaturbidite schist by Bundtzen and others (1994).

Alteration:

Silicification.

Age of mineralization:

Not known; probably mid-Cretaceous or younger, similar to other gold lodes near Nome.

Deposit model:

Possibly low sulfide, Au-quartz veins (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:

Six shallow shafts or prospect pits were dug before 1918, probably during the same period as prospecting near Twin Mountains Creek (Mertie, 1918 [B 662-I, p. 425-449]).

The area was mapped and a local soil geochemical survey completed by Kennecott Exploration Company in 1991.

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1918 (B 662-I); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Last Chance Creek (west bench)**Site type:** Mine**ARDF no.:** NM194**Latitude:** 64.7214**Quadrangle:** NM C-1**Longitude:** 165.4594**Location description and accuracy:**

This is a small bench placer mine located on the west side of Last Chance Creek, about 2,000 feet southwest of its confluence with North Fork Snake River. It is included in locality 89 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The map location is in the SW1/4 section 10, T. 9 S., R. 34 W., Kateel River Meridian. Mining claims were patented under U.S. Mineral Survey No. 1838.

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold, hematite, magnetite, pyrite, scheelite**Gangue minerals:****Geologic description:**

A bench placer was mined about 500 to 600 feet west of Last Chance Creek, immediately above its confluence with North Fork. The pit is oriented northeast, parallel to the modern drainage. The placer was mined hydraulically to bedrock for a distance of about 1,000 feet on the California Association and Good Chance Association claims (U.S. Mineral Survey No. 1838). Moffit (1913, p. 87) reported scheelite, pyrite, magnetite, and hematite from Last Chance Creek near Dewey Creek, a name not currently used. A quartz-ankerite vein cutting schistose bedrock is exposed at a bedrock drain of the cut. A sample of this vein did not contain gold, but it is similar to others in the area that are locally auriferous. Bedrock in the area is probably part of the 'mixed unit' of Till and others, 1986) and the calcareous metaturbidite schist of Bundtzen and others (1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

This small bench placer was mined hydraulically, probably before 1926. Claims were located between 1906 and 1916; the claims were surveyed for patent in 1926, and most of the workings predate that year.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and others, 1986; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (lower Boulder Creek)**Site type:** Prospect**ARDF no.:** NM195**Latitude:** 64.6441**Quadrangle:** NM C-1**Longitude:** 165.4953**Location description and accuracy:**

This prospect is at an elevation of about 175 feet on lower Boulder Creek, a west tributary to Snake River. The prospect is near the edge of the Snake River flood plain and about 6,000 feet upstream from the mouth of Boulder Creek. The map location is at the southwest corner of section 4, T. 10 S., R. 34 W., Kateel River Meridian. It is included in locality 94 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, limonite, pyrite**Gangue minerals:** Quartz**Geologic description:**

Auriferous quartz veins near the mouth of Boulder Creek were reported to contain 0.15 to 0.20 ounce of gold per ton (Collier and others, 1908, p. 196). Mertie (1918) reported a gold-bearing quartz vein in the bed of Boulder Creek on placer claim No. 1 Below Discovery; it was in a fault zone from which free gold could be panned. Examination of this area in 1991 located a lode prospect on the north side of Boulder Creek about 800 feet upstream from the downstream limit of patented mining claims. At this point, a short adit had been driven northeast on a limonite-stained quartz vein (Kennecott Exploration Company, written communication, 1992). The limonite probably replaced pyrite. No free gold was observed, but a sample of the vein contained about 0.1 ounce of gold per ton.

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; postdates regional metamorphism of the host rocks.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined**Site Status:** Inactive**Workings/exploration:**

A short adit, now caved, was driven northeast on an iron-stained quartz vein. This may be the same prospect as that reported by Collier and others (1908).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Mertie, 1918 (B 662-I); Cobb, 1972 (MF 463);
Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Alpha Creek**Site type:** Mine**ARDF no.:** NM196**Latitude:** 64.6263**Quadrangle:** NM C-1**Longitude:** 165.4937**Location description and accuracy:**

This small bench and alluvial placer gold mine is on Alpha Creek, a west tributary to Snake River. Their confluence is 0.9 mile west-northwest of the Snake River road crossing of Lindblom Creek. The main workings are where Alpha Creek enters the Snake River flood plain, at elevations of about 100 to 200 feet. This is locality 99 of Cobb (1972, MF 463; 1978, OFR 78-93). The map location is in the NW1/4 section 16, T. 9 S., R. 34 W., Kateel River Meridian; is accurate to within 1,000 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Alpha Creek placer deposit is on the flood plain of Snake River on the flank of the range of hills that extends from Monument Creek to Sledge Creek. On the basis of the configuration of tailings, the placer deposit was surface mined by scraper and gin pole. Cathcart (1922, p. 249) reported 'considerable' placer gold production from this small placer. Bedrock cleaned in mining was cut by numerous glassy quartz stringers containing sulfides and their alteration products. Cathcart (1922) did not find gold in the quartz samples that he assayed, but he reported that A.C. Stewart had obtained about 0.6 ounce of gold per ton in selected veinlets that he assayed. In addition to a local bedrock source, additional gold could have been derived from the Alpha Ridge lode prospect (NM171) at the head of Alpha Creek. Cathcart (1920) speculated that the gold either was distributed irregularly in the quartz veins or was derived from mineralized schist. The Alpha Creek placer is on schist bedrock on the east flank of the Twin Mountain anticline of Bundtzen and others (1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 36a); possibly partly residual.

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

39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

The Alpha placer deposit was worked, probably by scraper and gin pole, before 1920 (Cathcart, 1922). A reverse-circulation drill hole was completed near the ditch line above the placer by Kennecott Exploration Company in about 1994. Samples from this hole contained maximum gold values of a few hundredths of an ounce per ton.

Production notes:**Reserves:****Additional comments:****References:**

Cathcart, 1922; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Gold Hill**Site type:** Prospect**ARDF no.:** NM197**Latitude:** 64.6073**Quadrangle:** NM C-1**Longitude:** 165.4786**Location description and accuracy:**

This prospect is on the crest of hill 206, locally called Gold Hill, on the west side of Snake River between its tributaries Monument and Thompson Creeks. The map location is near the center of section 21, T. 10 S., R. 34 W., Kateel River Meridian. It is locality 44 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Ag, Au**Other:** Sb**Ore minerals:** Arsenopyrite, galena, gold (?), stibnite**Gangue minerals:** Albite, quartz**Geologic description:**

The Gold Hill prospect is on a low bedrock hill that is thinly covered by soil. Several subdued and sloughed prospect pits are near the crest of the hill, and another pit is on the southeast flank of the hill just above Snake River. Cathcart (1922, p. 247) described the deposits as thin quartz-feldspar veins and weathered sulfidized zones that panned free gold.

In 1990, Kennecott Exploration Company completed a soil geochemical survey over Gold Hill. The survey consisted of six north-trending lines 400 feet apart, along which soil samples were collected on 200-foot centers. The survey revealed extensive zones of high arsenic, moderate gold, and weak antimony geochemical anomalies. The soil survey was followed up by about 3,200 feet of roughly north-south trenching and by two diamond core holes, each about 350 feet deep (C.C. Hawley and Cindy Buxton, written communication, 1992). The trenching indicated that Gold Hill was crossed by about six lenticular east-northeast-trending mineralized zones as much as 80 feet wide. The best zone in the northern half of the easternmost trench contained 80 feet of material that assayed 280 to 2,540 ppb gold and 3,560 to more than 10,000 ppm arsenic. This zone is marked by sparse quartz boulders containing minor disseminated galena and by old prospect pits. The highest antimony values, 150 to 250 ppm, were in parts of the trench system having lower gold and arsenic values. Drill samples showed substantially lower values than

those in samples from the trenches, suggesting that gold was enriched near the surface. The upper 50 feet of core hole GHDH-2 penetrated about 40 feet of rock averaging 0.01 ounce of gold per ton and 5 feet of rock containing 1,360 ppb gold. Core hole GHDH-1 penetrated nearly 80 feet of mineralized schist and quartz veins near the bottom of the hole but values were generally less than 100 ppb gold; the maximum value for a 3-foot mineralized zone within the 80-foot zone was 2,210 ppb Au.

Alteration:

Sulfidation and silicification.

Age of mineralization:

Mid-Cretaceous or younger; postdates regional metamorphism of the host rocks.

Deposit model:

Low-sulfide Au-quartz veins (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:**

Cathcart (1922) reported as much as about 0.17 ounce of gold per ton in narrow vein zones. Soil sampling, trenching, and drilling by Kennecott Exploration Co. in 1990 and 1991 found wide low-grade zones that appear to have been upgraded by secondary enrichment.

Production notes:**Reserves:****Additional comments:****References:**

Cathcart, 1922; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Pioneer Gulch**Site type:** Mine**ARDF no.:** NM198**Latitude:** 64.6953**Quadrangle:** NM C-1**Longitude:** 165.4203**Location description and accuracy:**

This partly residual, alluvial placer gold mine is in Pioneer Gulch, a small west tributary to upper Snake River on the east side of hill 1276. The map site is in the NW1/4 section 23, T. 9 S., R. 34 W., Kateel River Meridian. It includes localities 35 and 90 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and locality 14 of Hummel (1962 [MF 247]).

Commodities:**Main:** Ag, Au**Other:****Ore minerals:** Arsenopyrite, gold, pyrite**Gangue minerals:** Calcite, quartz**Geologic description:**

A partly residual alluvial gold placer was mined in Pioneer Gulch as early as 1903 (Collier and others, 1908). Its discovery must have occurred early in the history of the Nome District because a 4.5 mile-long ditch had been constructed from Last Chance Creek to Pioneer Gulch by September of 1903 (Collier and others, 1908, p. 183). The placer gold was coarse and angular, and some had attached quartz fragments (Moffit, 1913). Prospecting for lode deposits, including at least one shaft, identified narrow limonitic calcite-quartz veins containing pyrite, arsenopyrite, and free gold (Cathcart, 1922). Gold-bearing quartz veins were exposed on the property in 1992. The veins cut graphitic schist that probably has an early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary; veins are mid-Cretaceous or younger because they cut schist metamorphosed in the mid-Cretaceous.

Deposit model:

Alluvial placer Au, in part residual, and low-sulfide Au-quartz veins (Cox and Singer, 1986; models 39a and 36a).

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

39a and 36A

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Surface mining of alluvial placer deposits commenced in 1903, and a residual placer deposit was mined by 1913. Hard rock exploration, including at least one shaft, was reported by Cathcart (1922).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Grub Gulch**Site type:** Mine**ARDF no.:** NM199**Latitude:** 64.7195**Quadrangle:** NM C-1**Longitude:** 165.3865**Location description and accuracy:**

This placer gold mine is on Grub Gulch, an east tributary to lower Goldbottom Creek. The mouth of Grub Gulch is about 1.5 miles upstream of the confluence of Goldbottom Creek and North Fork Snake River. About 1,400 feet of Grub Gulch has been placer mined upstream of the Snake River road crossing. The map location is at the approximate midpoint of the workings, in the SW1/4 section 12, T. 9 S., R. 33 W., Kateel River Meridian. This is locality 88 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

The lower half-mile or so of Grub Gulch, at surface elevations less than 300 feet, was placer mined by hand or horse-drawn scrapers and apparently worked out before 1905 (Collier and others, 1908; Moffit, 1913). The pay streak was 40 feet wide and 5 to 6 feet thick in gravels containing schist, vein quartz, and some granite boulders. Recovered gold was coarse, rough, and reported to run 3.75 dollars (about 0.18 ounce) per cubic yard (Moffit, 1913). Grub Gulch crosses graphitic quartz schists, calcareous mica schist, and a 150-foot-thick, east-dipping, highly competent granitic orthogneiss (C.C. Hawley, written communication for Kennecott Exploration Company, 1995). The placer mainly overlies mica schist bedrock that probably has an early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). The granitic boulders in Grub Gulch probably are derived from the orthogneiss upstream. In other nearby creeks that partly traverse orthogneiss (for example, Seattle Creek, NM200), quartz boulders are abundant along and immediately downstream from, orthogneiss bedrock sections of the creek, suggesting that some of the gold may have been derived from quartz veins at the contacts of the orthogneiss.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

This placer deposit was worked by hand or horse-drawn scrapers mainly between 1903 and 1906. The pay averaged about 0.18 ounce of gold per cubic yard.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Seattle Creek**Site type:** Mine**ARDF no.:** NM200**Latitude:** 64.6961**Quadrangle:** NM C-1**Longitude:** 165.3834**Location description and accuracy:**

This small placer mine is on Seattle Creek, a small southwest-flowing tributary to Snake River. A small amount of placer mining has taken place upstream of the Snake River road crossing of Seattle Creek. The map location is near the center of section 24, T. 9 S., R. 33 W., Kateel River Meridian. This is locality 91 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** W**Other:** Au**Ore minerals:** Scheelite**Gangue minerals:****Geologic description:**

Seattle Creek was examined during WW II and found to contain possibly important amounts of placer scheelite (Coats, 1944). Bedrock in the area includes graphitic mica schist, marble, and calc-muscovite schist, units that are probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). The placer ground in Seattle Creek is underlain only by granitic orthogneiss of uncertain age. This rock underlies about 800 feet of upper Seattle Creek and is cut off on the south by a steep, northwest-striking fault (C.C. Hawley, written communication for Kennecott Exploration Company, 1995). The parts of the creek underlain by orthogneiss contain quartz boulders. About 300 feet of the creek upstream of the fault--on orthogneiss bedrock--was worked by hand methods.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer containing scheelite and gold (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:

About 300 feet of upper Seattle Creek was worked by shovel-in methods.

Production notes:**Reserves:****Additional comments:****References:**

Coats, 1944; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Divining Creek**Site type:** Prospect**ARDF no.:** NM201**Latitude:** 64.6577**Quadrangle:** NM**Longitude:** 165.4223**Location description and accuracy:**

This alluvial gold placer prospect is on Divining Creek, a small east tributary to Snake River. This locality is upstream of the Snake River road crossing of Divining Creek and 1.6 miles north-northwest of Mount Byrnteson. The map location is in the NW1/4 section 2, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 93 of Cobb (1972 [MF 46], 1978 [OFR 78-93]).

Commodities:**Main:** Au, W**Other:****Ore minerals:** Gold, scheelite**Gangue minerals:****Geologic description:**

Divining Creek reportedly contains small amounts of placer gold and scheelite in 5- to 6-foot-thick gravels that are as much as 125 feet wide and extend along about 4,000 feet of the creek (Thorne and others, 1948). There is no reported mining. Bedrock in the area is graphitic schist probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au and scheelite deposit (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined.

Site Status: Inactive

Workings/exploration:

There are no reported workings or mining on Divining Creek.

Production notes:

Reserves:

Additional comments:

References:

Thorne and others, 1948; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Thorne and others, 1948

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Goodluck Gulch**Site type:** Prospect**ARDF no.:** NM202**Latitude:** 64.6447**Quadrangle:** NM C-1**Longitude:** 165.4590**Location description and accuracy:**

Goodluck Gulch is on the low slopes along the east side of Snake River, 1,400 feet due west of the Snake River road and 1.8 miles northwest of Mount Byrnteson. The map location is in the SW1/4 section 3, T. 10 S., R. 34 W., Kateel River Meridian. This is locality 38 of Cobb (1972 [MF 467], 1978 [OFR 78-93]). It is also locality 4 of Hummel (1962 [MF 247]) but Hummel's location is approximate. The location in this record is accurate within 500 feet.

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Arsenopyrite, galena, gold, pyrite, scheelite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

A deposit at Goodluck Gulch, approximately located by Hummel (locality 4, 1962 [MF 247]) was relocated by Kennecott Exploration Company in 1995. It apparently was first reported by Moffit (1913, p. 131) who noted: 'A large amount of highly mineralized quartz is present in schist exposures south of Good Luck Gulch . . . Panning shows the presence of gold.' Bedrock was not visible when the prospect was visited by Cathcart (1922, p. 247-248), but he did find scheelite in thin-section examination of dump material. The location is important because Goodluck Gulch is the northernmost significant deposit in a belt of gold lodes east of Snake River that extends northerly from near Bonanza Hill (NM228) and the Anvil fault through Rock Creek (NM207). Surface expression of this deposit includes a large quartz-boulder felsenmeer on the Snake River plain adjacent to the deposit; white vein quartz boulders in the felsenmeer are as much as 3 feet across. Old prospect trenches are on the upland adjacent to the felsenmeer. The quartz vein system in bedrock probably also extends some distance into the Snake River flood plain because large blocks of quartz are visible in the Snake River gravels on a northwesterly projection of the deposit; these boulders are not present north of this projection. The deposit extends uphill nearly to the Snake River road (Hummel's 1962 location) but is

best developed near Snake River.

Relocation of the prospect was followed in 1995 by soil geochemical sampling, trenching, and drilling. The deposit consists of schist extensively replaced by arsenopyrite, schist replaced by tabular albite impregnated by arsenopyrite, and veinlets and extensive masses of quartz as much as several feet across. Most of the deposit is crudely stratabound, and some is folded. Drill core in GLC95-2 at a depth of about 140 feet cuts nearly isoclinal folds with saddle-reef type quartz-feldspar veins in small-scale folds and as much as 5 percent arsenopyrite disseminated in the folded schist. Pyrite is less abundant than arsenopyrite, and galena is sparsely disseminated in quartz. Near the surface, the sulfidized schist is mainly weathered to a reddish iron oxide, probably hematite. Late-stage mineralized quartz occupies northeast-striking fissures, the common direction for late sheeted veins in the area. Bedrock in the area is graphitic schist probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Albitization and sulfidization, including dissemination of arsenopyrite in schist prior to development of northeast-striking sheeted veins.

Age of mineralization:

Probably mid-Cretaceous or younger, the time of regional metamorphism of the enclosing schist. Fold-controlled mineralization at Goodluck Gulch is assumed to be somewhat older than sheeted veins developed at Rock Creek (NM207).

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a); a residual gold placer is also developed on the lode.

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

36a

Production Status: None

Site Status: Inactive

Workings/exploration:

Cathcart (1922) reported that pits and short trenches were present on the property. In 1995, Kennecott Exploration Company explored the area with about 1,000 feet of backhoe trenches and diamond core holes; maximum gold grades were a few hundredths of an ounce per ton.

Production notes:

Reserves:

Additional comments:

There has probably been a very small amount of gold production from the residual placer. Cathcart (1922) reported sacked ore or concentrates on the property.

References:

Moffit, 1913; Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Balto Creek (Marcus; Hunch; Agnes Association)

Site type: Mine

ARDF no.: NM203

Latitude: 64.6360

Quadrangle: NM C-1

Longitude: 165.4534

Location description and accuracy:

This alluvial placer gold mine is on Balto Creek, an east tributary to Snake River. Placer mining has taken place upstream of the Snake River road crossing and about 1.5 miles west-northwest of Mount Byrnteson. The map location is in the W1/2 section 10, T. 10 S., R. 34 W., Kateel River Meridian, and the location is accurate within 500 feet. This is locality 95 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: W

Ore minerals: Gold, scheelite

Gangue minerals:

Geologic description:

Some placer gold mining occurred on Balto Creek in the early 1900s(Collier and others, 1908; Chapin, 1914 [B 592-L, p. 397-407]). The gold-bearing gravels were as much as 25 feet wide, 4 to 5 feet thick, and extended along the creek for about one-half mile (Moffit, 1913). This narrow drainage also contains some placer scheelite (Coats, 1944; Thorne and others, 1948). Bedrock in the area is graphitic schist that probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Some small surface placer mine workings are present.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Chapin, 1914; Coats, 1944; Thorne and others, 1948; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Prospect Creek**Site type:** Mine**ARDF no.:** NM204**Latitude:** 64.6305**Quadrangle:** NM C-1**Longitude:** 165.4516**Location description and accuracy:**

This small alluvial placer gold mine is on Prospect Creek, a small east tributary to Snake River. This placer is upstream of the Snake River road crossing of Prospect Creek and 1.5 miles west-southwest of Mount Byrnteson. The map site is in the south-central part of section 10, T. 10 S., R. 34 W., Kateel River Meridian and includes localities 41 and 96 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is accurate to within 500 feet.

Commodities:**Main:** Au, Bi (?), Cu (?), Pb, W**Other:****Ore minerals:** Galena, gold, scheelite**Gangue minerals:** Quartz**Geologic description:**

Small amounts of placer gold and scheelite occur in Prospect Creek gravels (Anderson, 1947; Thorne and others, 1948). One claim (the Terri) was surveyed for patent in 1976, and patent was granted in 1977 (U.S. Mineral Survey No. 2270). The Terri claim and an unpatented adjacent claim were mined for about 300 feet, probably by the claim owner, William Ullrich. Bedrock in the area is graphitic schist that probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). Anderson (1947) reported a galena- and bismuth-bearing quartz vein on Prospect Creek, but the exact location of the vein is unknown.

Alteration:**Age of mineralization:**

The placer deposit is Quaternary. The vein cuts schist metamorphosed during the mid-Cretaceous.

Deposit model:

Polymetallic vein(?); alluvial placer Au (Cox and Singer, 1986; models 22c and 39a).

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

22c? and 39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

One pit was mined on the upper Terri claim, possibly in the 1960s or 1970s. The claim was patented in 1977.

Production notes:**Reserves:****Additional comments:****References:**

Anderson, 1947; Thorne and others, 1948; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Anderson, 1947

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Lindblom Creek**Site type:** Mine**ARDF no.:** NM205**Latitude:** 64.6222**Quadrangle:** NM C-1**Longitude:** 165.4428**Location description and accuracy:**

This alluvial placer gold mine is on Lindblom Creek, an east tributary to Snake River. The placer is upstream of the Snake River road crossing of Lindblom Creek and 1.5 miles south-southwest of Mount Byrnteson. This is locality 97 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is in the east-central part of section 15, T. 10 S., R. 34 W., Kateel River Meridian, and is accurate to about 500 feet.

Commodities:**Main:** Au**Other:** W**Ore minerals:** Arsenopyrite, gold, scheelite**Gangue minerals:** Quartz**Geologic description:**

Small amounts of placer gold and scheelite are present on Lindblom Creek. Some placer gold was produced from 4- to 5-foot-thick gravels in the narrow, 25-foot-wide part of the upper creek (Collier and others, 1908; Moffit, 1913). Some scheelite-bearing quartz veins are also reported in the drainage (Coats, 1944; Anderson, 1947; Thorne and others, 1948).

Lower Lindblom Creek drains an area of sulfidized schist marked by an arsenic soil anomaly defined as greater than 400 ppm arsenic. A gold-in-soil anomaly, contained within the arsenic anomaly, defined as greater than 80 ppb gold, extends for about 2000 feet along and immediately north of Lindblom Creek (BHP Minerals, written communication, 1990; C. C. Hawley, written communication for Kennecott Exploration Company, 1993). The arsenic anomaly projects toward the extensive arsenic anomaly at the Rock Creek deposit (NM207) but is separated from it by a possibly barren zone along the post-mineral Brynteson fault, the unnamed, north-striking fault mapped by Hummel (1962 [MF 247]), about one-half mile west of Mount Brynteson.

The country rocks are mainly chloritic mica schist of Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Sulfidization of bedrock schist.

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer gold deposit probably in part developed as a residual placer on sulfidized (arsenopyrite) schist. (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 small-scale surface placer mine workings are present.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Coats, 1944; Anderson, 1947; Thorne and others, 1948; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (Lindblom Pit lode and lode on Byron Association Placer claim, U.S. Mineral Survey No. 1835)

Site type: Prospect

ARDF no.: NM206

Latitude: 64.6190

Quadrangle: NM C-1

Longitude: 165.4362

Location description and accuracy:

This prospect is on the lower southwest slopes of Mount Byrnteson between Lindblom Creek and Rock Creek. The map site is on the northeast end line of a patented claim (U. S Mineral Survey 1835), in the SE1/4 section 15, T. 10 S., R. 34 W., Kateel River Meridian. This site is the approximate boundary between a prospect locally called Lindblom Pit (above 250 feet elevation) and a lode on Byron Association patented placer claim U.S. Mineral Survey No. 1835 (below 250 feet elevation). It is accurate to within about 500 feet.

Commodities:

Main: Au

Other: Ag, Pb, Zn

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

Gangue minerals: Albite, calcite, quartz

Geologic description:

The informally named Lindblom Pit prospect crops out and is exposed in trenches between elevations of about 300 to 400 feet on the hill slope between Lindblom and Rock Creeks. The deposit consists of sulfide-bearing sheeted quartz veins that cut pelitic schist, marble, and quartzite, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). The deposit is dominantly arsenic- and albite-rich; grades locally exceed 0.3 ounce of gold per ton, but at least four drill holes found little continuity in the veins. Kennecott Exploration Company subsequently optioned and explored the Byron Association Placer Claim (U.S. Mineral Survey No. 1835), which extends uphill to about 250 feet in elevation about on strike (northeast) with the deposit at Lindblom Pit. Trenches and shallow drill holes on the northeast part of the placer claim disclosed a sheeted vein system, superficially like the one at Rock Creek (NM207). Quartz veins in steep northeast-striking fissures contain arsenopyrite, galena, pyrite, and sphalerite but have relatively low gold contents. The best trench intercept was about 40 feet of material

containing 0.02-0.03 ounce of gold per ton. The sheeted vein complex was developed above a low-angle arsenic-rich fault zone (Ben Porterfield, oral communication, 2000).

The Lindblom Pit lode is northeast of the northeast end line of the patented claim (U.S. Mineral Survey No. 1835). Holes drilled on the Lindblom Pit prospect by Newmont Mining Company in 1992 were collared between approximate elevations of 325 and 380 feet. In about 1995, Kennecott Exploration Company obtained a lease on the patented claim and explored the southwest projection of the lode deposit at elevations between 150 and 250 feet. Both prospects are within a very large arsenic soil anomaly. This anomaly was first defined by BHP in about 1989-90 and extended by Kennecott in 1994 and 1995. The anomaly is marked by soils containing greater than 400 ppm arsenic; extensive areas contain more than 2,000 ppm arsenic. The anomalous area is separated from similar arsenic-rich rocks by the Brynteson fault. This fault strikes N 5-10 E; it is almost certainly post-mineral and separates the Lindblom lode prospect area from the Rock Creek area (NM207 to NM215).

Small amounts of placer gold and scheelite are present on Lindblom Creek (NM205) immediately north of this lode prospect. Some placer gold was produced from 4- to 5-foot-thick gravels in the narrow, 25-foot-wide part of the upper creek (Collier and others, 1908; Moffit, 1913). Some scheelite-bearing quartz veins are also reported in the drainage (Coats, 1944; Anderson, 1947; Thorne and others, 1948).

Alteration:

Albitization, silicification, and sulfidization.

Age of mineralization:

Probably mid-Cretaceous or younger, the time of regional metamorphism of the host rocks.

Deposit model:

Low-sulfide Au-quartz veins (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:

Prospect pits, small trenches, and drill holes have explored this prospect. It is within a large soil geochemical anomaly characterized by high arsenic content. An association placer claim was located in 1908 and was patented by Elizabeth Joliffe in 1925 (Byron Association, U.S. Mineral Survey No. 1835). The claim was explored by long northeast-aligned cuts that may have exposed small residual placer deposits, which were not extensively developed. The Lindblom Pit area appears to have been discovered or relocated in about 1986 by R.V. Bailey, a geologist of Denver, Colorado, during work on the nearby Rock Creek deposits (for example, NM207). The area was within a large geochemical

soil survey carried out by BHP in 1990. The deposit was trenched and drilled by Newmont Mining Company in 1992. Kennecott Exploration Company subsequently optioned the Byron Association claim and explored it with trenches and drill holes (Ben Porterfield, oral communication, 2000).

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Coats, 1944; Anderson, 1947; Thorne and others, 1948; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Rock Creek (lode); Nugent**Site type:** Prospect**ARDF no.:** NM207**Latitude:** 64.6156**Quadrangle:** NM C-1**Longitude:** 165.4155**Location description and accuracy:**

The Rock Creek lode prospect is best developed for a strike distance of about 1,000 feet in the Rock Creek valley above the confluence of Rock Creek and Sophie Gulch (NM208). The map location is the approximate midpoint of the deposit, about 1.4 miles southwest of Mount Brynnetson. Surface elevations at the prospect range from 230 to 270 feet. The location is just inside the south-central border of section 14, T. 10 S., R. 34 W., Kateel River Meridian, and it is accurate to within 500 feet. It is included in locality 43 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The prospect includes a claim or site called Nugent by Mertie (1918 -- A012834).

Commodities:**Main:** Au**Other:** Ag, Pb, Sb, W, Zn**Ore minerals:** Arsenopyrite, boulangerite, galena, gold, hematite, limonite, pyrite, scheelite, sphalerite**Gangue minerals:** Albite, ankerite, calcite, quartz**Geologic description:**

Gold-bearing, northeast-striking quartz veins in schist were known on Rock Creek by 1903 (Collier and others, 1908). Sheeted veins were later described, massive veins were locally worked, and some residual placer gold and scheelite were produced from weathered sheeted vein complexes (Moffit, 1913, p. 75-76; Mertie, 1918 [B 662-I, p. 436]; Cathcart, 1922). Lodes in the Rock Creek area were principal examples of disseminated lode gold deposits identified in a regional mineral assessment during the 1970's (Hudson and others, 1977; Hudson and DeYoung, 1978). This deposit is the most extensively explored gold lode in the Nome mining district. Significant exploration, including extensive trenching and drilling, has taken place episodically through the 1980's and 1990's since its relocation by geologist R. V. Bailey of Denver in the early 1980's. Active exploration, primarily infill drilling to better define gold grades, continues at the time of this writing (May, 2000).

The most typical and highest grade part of the Rock Creek lode consists of a sheeted

vein complex. The veins strike northeast and generally dip at a high angle to the northwest. They generally range from 1 inch to 6 inches thick, although some veins are more than 1 foot thick. Vein spacing is locally about one per foot. Cathcart (1922, p. 246) described a sheeted zone near the mouth of Sophie Gulch (NM208), where 23 quartz veins from 1 inch to 8 inches thick are in a zone 28 feet wide. In general, sheeted veins are well exposed in mechanical and hydraulic cuts in a 1,000-foot-long interval north of Sophie Gulch (NM208). Although good mineralization was found in some drill holes south of the Sophie Gulch fault, such as in Placer Dome RR-8-088, this fault appears to cut off or displace the best mineralization. The quartz and quartz-calcite veins of the sheeted set are composed mainly of white quartz with some internal crustification, but they are not banded. Albite tends to occur on the selvages and in adjacent wall rocks. Cathcart (1922) and others have reported muscovite in the veins. Sulfides tend to be relatively abundant close to the selvage, but are disseminated throughout the quartz. They consist mainly of pyrite, galena, stibnite, and sphalerite. Arsenopyrite is present but is more abundant in schist than in the veins. Lead sulfosalts such as boulangerite occur locally. Limonite tends to form on weathered veins, hematite on weathered arsenopyrite zones. The deposit is relatively long compared to its apparent thickness. Sheeted veins and most of the gold appear to lie above a marble-rich stratum at a depth of 250 to 300 feet. Individual quartz stringers pinch and swell and may end abruptly at a slip plane parallel to schistosity.

The main Rock Creek deposit intergrades with other types of deposits. Opposite the mouth of Sophie Gulch, sheeted veins 2 to 3 feet apart are in quartz-mica schist, but there are extensive arsenic- and albite-rich zones in the schist. Well-developed, fold-controlled quartz-albite zones were exposed in Kennecott trench RCT-94-8. The trench and adjacent hill slopes display arsenic-rich lodes of northwest strike. This area has locally been called Arsenic Hill. The Reinisch hydraulic pit (NM213) is in this area. A distinct vein called the Albion (NM211) was exposed by mine workings in upper Rock Creek; it probably is partly coincident with sheeted veins typical of the main Rock Creek deposit. The deposit at the Walsh Cut (NM214) resembles that at the Reinisch.

Most of the country rocks exposed at the prospect belong to the chlorite-rich metaturbidite schist and marble unit of Bundtzen and others (1994) or to the lower part of the 'mixed unit' of Till and others (1986). Graphitic mica schist and graphitic quartz schist are common; the graphitic quartz schist is locally a good marker unit. Schistosity generally strikes northeast and dips are low to moderate southeast. Quartz veins of the sheeted set are close to orthogonal to the schistosity. The schist appears to be a phyllonite. Although schistosity appears to be close to concordant with lithology, it is penetrative. Some coarse-grained units have incipient augen structure and are believed to have been sheared during a period of metamorphism that could be contemporaneous with early mineralization. Locally, schist is strongly mineralized with arsenopyrite and albite concordant to schistosity. Bedrock in the area probably is of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Du-moulin, 1994; Bundtzen and others, 1994).

Detailed mapping for Kennecott Exploration Company identified a strong northeast-striking fault that appears to cut off the Sophie Gulch fault. The fault, called the Arsenic Hill fault, is exposed in Placer Dome trench RRT-87-1 and in Kennecott Exploration Company trench RCT-94-8. The fault appears to localize complexly sheared graphitic quartz veins and may have both pre- and post-mineral history. It is subparallel and en

echelon to the Albion (NM211) and proposed Calle (NM212) vein-fault structures.

Apodaca (1994) studied fluid inclusions and other detailed aspects of the vein geology at Rock Creek. Her work indicates that Rock Creek formed from low-salinity fluids relatively rich in carbon dioxide, methane, and nitrogen, along with some hydrogen sulfide. Fluid inclusions indicate an estimated temperature of formation in the range of 225 to 275 degrees Centigrade. The Rock Creek deposit is probably similar in age (109 Ma) to the gold-quartz deposits at Bluff (Ford and Snee, 1996).

Alteration:

Early alteration consists of locally extensive albitization and sulfidization (introduction of arsenopyrite; late alteration consists of minor sericitization and albitization along with introduction of sheeted veins; and local development of ankerite.

Age of mineralization:

Mid-Cretaceous. The country rocks are part of the Nome Group derived from Proterozoic to lower Paleozoic protoliths (Till and Dumoulin, 1984). The Nome Group underwent regional blueschist facies metamorphism in the Late Jurassic or Early Cretaceous (Sainsbury and others, 1970 [P 750-C]; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Hannula and McWilliams, 1995). The blueschist facies rocks were recrystallized to greenschist or higher metamorphic grades in conjunction with regional extension, crustal melting, and magmatism in the mid-Cretaceous (Hudson and Arth, 1983; Miller and Hudson, 1991; Miller and others, 1992; Dumitru and others, 1995; Hannula and others, 1995; Hudson, 1994; Amato and others, 1994; Amato and Wright, 1997, 1998). Lode gold mineralization on Seward Peninsula is mostly related to the higher temperature metamorphism in the mid-Cretaceous (Apodaca, 1994; Ford, 1993 [thesis]; Ford and Snee, 1996; Goldfarb and others, 1997).

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Active

Workings/exploration:

Gold-bearing, northeast-striking quartz veins in schist were known on Rock Creek by 1903 (Collier and others, 1908). Sheeted veins were later described, massive veins were locally worked, and some residual placer gold and scheelite were produced from weathered sheeted vein complexes (Moffit, 1913, p. 75-76; Mertie, 1918 [B 662-I, p. 436]; Cathcart, 1922). Lode prospects in the Rock Creek area were principal examples of disseminated lode gold deposits identified in a regional mineral assessment during the 1970's (Hudson and others, 1977; Hudson and DeYoung, 1978). This deposit is the most extensively explored gold lode in the Nome mining district. Significant exploration including

extensive trenching and drilling has taken place episodically through the 1980's and 1990's since its relocation by geologist R. V. Bailey of Denver in the early 1980's. Active exploration, primarily infill drilling to better define gold grades, continues at the time of this writing (May, 2000).

Bailey reopened trenches in the hydraulic cuts north of Sophie Gulch and exposed and sampled the sheeted veins. His work brought Placer Dome into the project in 1987 to 1989. Placer Dome drilled dozens of holes on regular, northwest-aligned fences approximately 200 feet apart for nearly 2,000 feet northeast from the mouth of Sophie Gulch. Both core and RC holes were drilled, and essentially all were steeply inclined to the southwest, perpendicular to the strike of the sheeted veins.

Some of this drilling was difficult. The water table is close to the surface and some holes had artesian flow. The program was sufficient to outline a geologic resource, but it was considered subeconomic by Placer Dome. An extensive soil geochemical survey was completed in the area by BHP in 1989, and the property was optioned by Newmont Mining Company in 1992. Some new drill holes, including holes to confirm Placer Dome tests, were drilled by Newmont. The property was further explored in 1994 and 1995 by Kennecott Exploration Company, who drilled a few holes along the northwest fences. The holes were inclined to the northwest so that they would be nearly at right angles to bed-rock schistosity in lower Rock Creek. Both Placer Dome and Newmont carried out preliminary metallurgical work; it appears that about 70 percent of the gold is present as free gold; the balance is in auriferous sulfides, principally pyrite and arsenopyrite. Exploration is continuing on the prospect in 2000 by Novagold Resources. In 1999, they announced that better recovery and analytic techniques suggested higher average grades for the deposit, perhaps about 3 grams of gold per metric tonne.

Production notes:

Reserves:

The drill-indicated resource, including inferred material, is about 740,000 ounces of gold at a grade of 2.88 grams per metric tonne above a cut off of 1 gram gold per metric tonne (Novagold Resources, written communication, April 17, 2000).

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury and others, 1970; Cobb, 1972 (MF 463); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Hudson and others, 1977; Cobb, 1978 (OFR 78-93); Hudson and DeYoung, 1978; Hudson and Arth, 1983; Forbes and others, 1984; Thurston, 1985; Armstrong and others, 1986; Miller and Hudson, 1991; Miller and others, 1992; Ford, 1993 (thesis); Till and Dumoulin, 1994; Apodoca, 1994; Hudson, 1994; Bundtzen and others, 1994; Amato and others, 1994; Dumitru and others, 1995; Hannula and others, 1995; Hannula and McWilliams, 1995; Ford and Snee, 1996; Goldfarb and others, 1997; Amato and Wright, 1997; Amato and Wright, 1998.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Sophie Gulch (Rock Creek)**Site type:** Mine**ARDF no.:** NM208**Latitude:** 64.6138**Quadrangle:** NM C-1**Longitude:** 165.4157**Location description and accuracy:**

Sophie Gulch is a small east tributary to Rock Creek that enters Rock Creek at an elevation of about 230 feet and about 0.85 mile northeast of the Rock Creek crossing of the Snake River road. Sophie Gulch was included in localities 43 and 98 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location shown as Sophie Gulch by Hummel (1962 [MF 247, location 17]) is the same as the Walsh Cut (NM214) of this report. The Sophie Gulch deposit was covered by U.S. Mineral Survey No. 721 (No. 1 Sophie Gulch Placer). The map location is just inside the north-central border of section 23, T. 10 S., R. 34 W., Kateel River Meridian and it is accurate to within 500 feet.

Commodities:**Main:** Au, W**Other:** Pb**Ore minerals:** Arsenopyrite, galena, gold, hematite, pyrite, scheelite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

Sophie Gulch was placer mined for tungsten (scheelite) in 1916 (Mertie, 1918 [B 662-I, p. 457]); presumably some gold was also recovered. The mine location was about 300 feet above the point where Sophie Gulch enters the flood plain of Rock Creek. The tungsten deposit was a residual placer on mineralized bedrock; the bedrock itself was described as too low grade to be mined. About 4,000 to 5,000 cubic yards of residual placer material were mined and sluiced here that year. Mertie (1918) believed that the Sophie Gulch deposit produced a large percentage of all the scheelite mined in Alaska during 1916, when scheelite was actively sought because of high World War I prices. Scheelite was also reported on the selvages of the northeast-striking sheeted veins. Cathcart (1922, p. 246) visited Sophie Gulch a few years after Mertie. He reported quartz-feldspar and quartz-calcite veins of 'all directions', arsenopyrite, galena, and pyrite in the veins, and abundant arsenopyrite in the schist walls of the veins. Cathcart described the scheelite as yellow-brown and believed that the reddish hematitic alteration of the schist resulted from oxidation of arsenopyrite.

Sophie Gulch closely follows a post-mineral(?), high-angle fault that strikes N 80 W. The fault is generally on the south side of Sophie Gulch; it was exposed and mapped in a trench by Kennecott Exploration Company in 1994. At the mouth of Sophie Gulch, the rocks south of the fault are graphitic quartz schist; the rocks north of the fault are mostly calcareous quartz-mica schist. The schist is cut by northeast-striking sheeted quartz veins. The schist's compositional layering and foliation strike northeast and dip southeast at low to moderate angles.

Locally, the calcareous quartz-mica schist contains albitized zones concordant to the schistosity. The schist unit is succeeded upstream by graphitic mica schist. About 200 feet upstream on the north side, a concordant mineralized zone, locally at least 5 feet thick, was also found in Placer Dome's 1987 trench RT-7-7 (Placer Dome, written communication, 1987). Rocks in this zone contain arsenopyrite, subordinate pyrite, albite, and quartz. This zone dips gently to the southeast and appears to be the tungsten mining location described by Mertie when he visited the prospect in 1916 (Mertie, 1918).

Alteration:

Silicification, albitization, sulfidization, and oxidation of arsenopyrite to hematite.

Age of mineralization:

Mid-Cretaceous; veins cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a); residual scheelite placer.

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

36a

Production Status: Yes; small

Site Status: Active

Workings/exploration:

A placer deposit on Sophie Gulch was discovered early in the history of the Nome district. The patent plat issued for No. 1 Sophie Gulch Placer (U.S. Mineral Survey No. 721) shows three cuts in Sophie Gulch itself and a shaft on bedrock north of the gulch. The prospect was developed by shallow underground workings prior to 1916 when it was exploited for tungsten in a hydraulic open cut. Most of the tungsten-rich residual placer was mined then. During World War II, three bulldozer cuts showed very little remaining residual material (Coats, 1944) The area was prospected by R.V. Bailey in the 1980s and was extensively trenched and drilled in 1987 and 1988 by Placer Dome. It was further explored by Newmont in 1992 and by Kennecott Exploration Company in 1994 and 1995. An area that includes Sophie Gulch is being actively explored by Novagold Resources (May, 2000).

Production notes:

Small production at Sophie Gulch began prior to 1916; it was mined extensively in 1916, mainly for tungsten. About 4,000 to 5,000 cubic yards of scheelite-bearing material were processed in 1916 (Mertie, 1918 [B 662-I, p. 425-449]; Coats, 1944; Thorne and others, 1948; Cobb, 1975).

Reserves:

Additional comments:

In 1944, the unweathered material was too low grade to mine for tungsten (Coats, 1944, p. 3).

References:

Mertie, 1918 (B 662-I); Cathcart, 1922; Coats, 1944; Thorne and others, 1948; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Rock Creek (placer)**Site type:** Mine**ARDF no.:** NM209**Latitude:** 64.6117**Quadrangle:** NM C-1**Longitude:** 165.4172**Location description and accuracy:**

Rock Creek is a southwest-flowing tributary of Snake River with headwaters on the south flank of Mount Brynteson. Placer workings are present along about 1.5 miles of Rock Creek; the approximate midpoint of the workings are in the NW1/4 section 23, T. 10 S., R. 34 W., Kateel River Meridian. The most extensive deposits were developed between elevations of about 200 to 350 feet. The location is the approximate discovery point (Francisco Placer, U.S. Mineral Survey No. 721) of the placer deposit. It is locality 98 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold, limonite, magnetite, scheelite**Gangue minerals:** Garnet**Geologic description:**

The main Rock Creek placer deposit is an alluvial placer developed in the flood plain of modern Rock Creek. The deposit was discovered by Lindeberg, Lindblom, and Brynteson in the fall of 1898 within a few days or weeks of the discovery of the Anvil Creek placer (NM236). Rock Creek was visited by the U.S. Geological Survey in 1903 (Collier and others, 1908). At that time, one company, presumably the Pioneer Mining Company, was working on five claims. Gold was distributed throughout pay gravel that was only about 5 feet deep. The gold was mainly fine with a few rough nuggets. Semiangular scheelite occurred in the concentrates along with magnetite, limonite, and garnet. The part of the deposit in the main Rock Creek flood plain was as much as 300 feet wide on the No. 4 Above claim and an adjacent west bench claim. It was relatively shallow, about 5 to 12 feet deep, and was developed on hard schist bedrock where indentations and irregularities acted as riffles. This placer deposit was largely worked out by 1905, probably by hand shovel-in and scraper operations. A series of hydraulic pits on the east side of Rock Creek above Sophie Gulch appears to be on a residual placer developed on the main Rock Creek sheeted vein complex (NM207). This part of the placer may have been devel-

oped somewhat later, as was the residual scheelite-rich placer mined in Sophie Gulch in 1916 and 1917 (NM208). Cathcart (1920) reported mining on Rock Creek in 1918; Smith (1926) reported mining in 1924. Scheelite reportedly was mined in 1943 (Anderson, 1947). Thorne and others (1948) reported scheelite along the main 1.5 mile length of the Rock Creek placer. Coats (1944) believed that Rock Creek was one of the more important scheelite-bearing creeks in the Nome area. In general, it is difficult to distinguish between descriptions of mining along Rock Creek and that along the more limited Sophie Gulch deposit. Total production from the Rock Creek placer has been estimated to be about 30,000 ounces of gold.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes**Site Status:** Inactive**Workings/exploration:**

The placer deposit in Rock Creek was discovered in the fall of 1898 by the pioneers of the Nome district, Jafet Lindeberg, Erik O. Lindblom, and John Brynseton. The discovery claim was named Francisco. Claims extended upstream to the 6 Above claim, about at the confluence with Albion Creek. By 1905, the date of the patent survey, a placer deposit as much as 300 feet wide had been worked continuously from the Francisco claim to the 5 Above claim in the main flood plain of Rock Creek. An east side residual placer appears to have been worked in a series of hydraulic pits above Sophie Gulch. When the claims were patented in 1906, the value of improvements reported by the Pioneer Mining Company was in excess of 300,000 dollars. Estimated total production was about 30,000 ounces of gold. Metcalfe and Tuck (1942) thought that there was sufficient pay left, probably mainly in a buried bench channel (NM210), to justify a small dragline operation at Rock Creek.

Production notes:

Estimated total production was about 30,000 ounces of gold.

Reserves:**Additional comments:**

References:

Collier and others, 1908; Moffit, 1913; Mertie, 1918 (B 662-I); Cathcart, 1920; Cathcart, 1922; Smith, 1926; Metcalfe and Tuck, 1942; Coats, 1944; Anderson, 1947; Thorne and others, 1948; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Rock Creek (bench placer)**Site type:** Mine**ARDF no.:** NM210**Latitude:** 64.6133**Quadrangle:** NM C-1**Longitude:** 165.4227**Location description and accuracy:**

This locality is a bench placer on the crest of a low knoll locally called Arsenic Hill on the west side of Rock Creek at an elevation of about 230 feet. It is 3,000 feet due east of the Snake River road. The deposit is accurately located in the NW1/4 section 23, T. 10 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:** Ag, W (?)**Ore minerals:** Gold, scheelite (?)**Gangue minerals:****Geologic description:**

An elevated alluvial (bench) placer is partly preserved west of Rock Creek on the south part of Arsenic Hill. The base of the channel is at an elevation of about 220 feet, or about 20 feet higher than the base of the alluvium in modern Rock Creek to the east. At the time of the formation of the elevated channel, an ancestral Rock Creek left the modern drainage and flowed southwest and then west-southwest. It can be traced for about 700 feet to a linear swale developed along the Brynteson fault; possibly the channel turned more southerly at that point. The channel ranges from about 100 to 120 feet across. Its southeast limit above Rock Creek was mined hydraulically in a pit that was about 120 feet long. The rest of the channel was developed from a series of at least six shallow shafts, which probably follow the deepest part of the channel.

The channel is subparallel to the Arsenic Gulch fault, a strong fault that may have partly controlled the course of the old channel (Kennecott Exploration Company, unpublished data). The fault nearly coincides with the north limit of the channel where it leaves modern Rock Creek. Probably only a small amount of gold was recovered from the area of the shafts. This part of the channel may be the location of the small reserve suitable for dragline mining that was noted by Metcalfe and Tuck (1942).

Alteration:

Age of mineralization:

Pleistocene.

Deposit model:

Alluvial 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:

The elevated channel was mined hydraulically and from shallow underground workings, probably before 1920.

Production notes:**Reserves:**

A small reserve is probably present.

Additional comments:**References:**

Metcalf and Tuck, 1942.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Albion**Site type:** Prospect**ARDF no.:** NM211**Latitude:** 64.6198**Quadrangle:** NM C-1**Longitude:** 165.4076**Location description and accuracy:**

The Albion lode prospect is in the headwaters of Rock Creek near the mouth of Albion Creek, a south-southwest flowing tributary of Rock Creek that enters Rock Creek at an elevation of about 400 feet. The map location is in the SE1/4 section 14, T. 10 S., R. 34 W., Kateel river Meridian. It is locality 42 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is accurate within about 250 feet.

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

The Albion deposit originally was developed by a shaft reportedly on the north side of Albion Creek (Cathcart, 1922, p. 247), possibly on a bench claim originally located in 1900. This claim was surveyed and patented by Daniel B. Camp in 1908 and called the Bench Claim No. 6 Above on Right Limit of Rock Creek Placer (U.S. Mineral Survey No. 332). Cathcart (1922) reported that the shaft was 50 feet deep and that the vein pinched out. The vein reportedly assayed about 120 dollars or about 6 ounces of gold per ton.

Exploration since 1987 suggests that the Albion vein may have more continuity or it may at least be representative of a somewhat different style of mineralization than originally thought. In contrast to typical Rock Creek quartz, which is white and not banded, the typical Albion quartz vein is bluish-gray and well banded, and contains a fairly high ratio of free gold to sulfides. Unlike the sheeted veins at Rock Creek (NM207), the Albion-type veins appear to have significant lateral and probably vertical extent. The Albion deposit or a related lode was drilled by Placer Dome and Newmont Mining Company about 2,600 feet northeast of Sophie Gulch (Kennecott section 3700NE). Three core holes (Newmont 92-005 and Placer Dome 88-35 and 88-36) indicated an almost vertical vein structure having a true thickness of at least 20 feet. All three drill holes had 5-foot

intercepts that contained more than 0.3 ounce of gold per ton. The bottom sample in Placer Dome hole 88-36 contained 1.373 ounces of gold per ton. Drilling southeast of Albion Creek suggests that a similar vein may be present east of Rock Creek in the Calle Creek area (NM212).

Alteration:

Silicification.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: No**Site Status:** Undetermined**Workings/exploration:**

The Albion deposit probably was discovered and claimed by Daniel B. Camp around 1900; the claim, called a right-limit bench, was patented in 1908 (U.S. Mineral Survey No. 332). The plat shows the location of three shafts, but it does not indicate whether the shafts were for placer or lode prospecting. They appear to be in the lode location described by Cathcart (1922). Both Newmont and Placer Dome completed drill holes on this prospect.

Production notes:**Reserves:****Additional comments:****References:**

Cathcart, 1922; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Unnamed (lode in Calle Creek area)**Site type:** Prospect**ARDF no.:** NM212**Latitude:** 64.6178**Quadrangle:** NM C-1**Longitude:** 165.4104**Location description and accuracy:**

Calle Creek is an ephemeral northwest-flowing creek that enters upper Rock Creek at an elevation of 310 feet approximately 1,700 feet northeast of Rock Creek's confluence with Sophie Gulch. The name is used on old maps of the Rock Creek area, but it is not currently used. The map site is the mid-point of a fault zone with quartz veins that sub-crops southeast of Rock Creek, in the SE1/4 section 14, T. 10 S., R. 34 W., Kateel River Meridian. It is accurate to within 500 feet.

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

The mineralized Calle Creek fault subcrops about 350 southeast of Rock Creek and can be traced, mainly in drill holes, for at least 1,200 feet nearly parallel to the creek. It strikes about N 45 E, dips steeply to the northwest, and ranges from 20 to 50 feet thick. It appears to be somewhat offset from, but parallel to, another fault locally called the Arsenic Hill fault (Kennecott Exploration Company, written communication, 1994, 1995).

Most of the drill holes across the Calle Creek fault are reverse circulation. A Placer Dome core hole (RR-88-032) on Kennecott Exploration Company section 3300NE bottomed in crushed and slickensided vein fault material that contained as much as 0.472 ounce of gold per ton. In general, assay gold values in the fault zone are relatively low. On Kennecott Exploration Company section 2500NE, a 25-foot section in Placer Dome RR-88-027, averaged 0.111 ounce of gold per ton; on the same section, a 15-foot section of a Kennecott Exploration Company core hole (RCC-94-11) assayed 0.105 ounce of gold per ton. The sheared structure of the vein zone and irregular assay results are consistent with a pre-mineral fault that was mineralized and subsequently sheared, as has been inferred for the Arsenic Hill fault. If this interpretation is correct, the Arsenic Hill (NM213), Calle Creek, and possibly Albion (NM211) faults could be fundamental con-

trols on the Rock Creek mineralized system.

Southwest of the Calle Creek fault, a 40- to 65-foot-thick layer of graphitic quartz schist can be followed in drill holes for about 1,200 feet, rising slightly to the northeast. Cross sections suggest that the graphitic schist is warped into open folds trending northeast, generally in the region occupied by the main Rock Creek sheeted vein zone (NM207).

Rocks exposed along Rock Creek in the series of hydraulic pits north of Sophie Gulch are mainly calc-mica schist as far northeast as Calle Creek, where a short spur road leaves Rock Creek to the south. To the north of this road, the calc-mica schist is overlain by a much more resistant quartz mica schist. Foliation in both schist units strikes north to north-northeast and dips gently to the east and east-southeast. Graphitic units are much less abundant southeast of the Calle Creek fault.

Alteration:

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low sulfide Au-quartz veins (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 area was extensively drilled by Placer Dome in 1987 and 1988; further drilling was done by Kennecott Exploration in 1994. The Rock Creek area is currently (May, 2000) being explored by Novagold Resources.

Production notes:

Reserves:

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Reinisch (Arsenic Hill)**Site type:** Prospect**ARDF no.:** NM213**Latitude:** 64.6145**Quadrangle:** NM C-1**Longitude:** 165.4218**Location description and accuracy:**

This lode prospect is on the same low knoll, locally called Arsenic Hill, along the west side of Rock Creek as the Rock Creek bench placer (NM210). Cathcart (1922, p. 245) described the location as opposite the mouth of Sophie Gulch. It is 3,400 feet due east of the Snake River road and about 1.6 miles south-southwest of Mount Byrnteson. Rock Creek is an east tributary to Snake River with headwaters on the south flank of Mount Byrnteson. The map location is midway between the 250- and 300-foot contours, just inside the north boundary of section 23, T. 10 S., R. 34 W., Kateel River Meridian. The prospect was included in locality 43 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and is locality 15 of Hummel (1962 [MF 247]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Arsenopyrite, gold, hematite, limonite, pyrite, scorodite**Gangue minerals:** Albite, calcite, graphitic carbon, quartz**Geologic description:**

Cathcart (1922, p. 245) reported free gold in vuggy crystalline quartz in quartz-muscovite-graphite schist at this locality, which he described as a hydraulic pit (Reinisch) on a bench opposite Sophie Gulch. In recent years this bench has been called Arsenic Hill. The name apparently was applied in the 1980s by geologist R.V. Bailey to abundant exposures rich in arsenopyrite and its oxidation products, hematite, limonite, and scorodite.

Arsenic Hill is the low rounded ridge opposite the mouth of Sophie Gulch on the west side of Rock Creek. The crest of the ridge is at an elevation of about 280 feet. It is underlain by moderately resistant quartz-mica schist. Northeast-striking sheeted quartz veins are as much as one-half foot thick. The veins are spaced about 3 to 5 feet apart near the top of the ridge.

Southwest of the crest of Arsenic Hill, the quartz-mica schist appears to be much more altered and only locally crops out. This area was explored by Placer Dome trench 87-1,

which cuts northwest across the ridge, and by Kennecott Exploration Company trench 94-8, which trends northeasterly subparallel to the sheeted vein structure. The Kennecott trench cuts across fold- and possibly fault-controlled mineral zones in schist that mainly contain arsenopyrite, which has been extensively oxidized to scorodite, hematite, and limonite. Sheeted veins cut across the northwest-aligned arsenopyrite-rich zones. Albite is locally abundant in the northwest-aligned structures. Sheeted veins exposed near the southwest end of trench 94-8 are deformed, apparently by recent slump and creep. The Arsenic Hill deposit explored by Placer Dome and Kennecott Exploration Company contains little gold.

The quartz-mica schist of Arsenic Hill is cut off on the southeast by the Arsenic Hill fault, a structure that crosses the ridge at an elevation of about 230 feet. Where exposed in trenches and subcrops, the fault locally contains graphitic zones with crystalline quartz, apparently similar to the gold-bearing rocks originally described by Cathcart (1922). Rocks southeast of the fault are relatively soft, graphitic calc-mica schist and resistant graphitic quartz schist. This graphitic schist is bounded to the northwest by the Arsenic Hill fault and to the northeast by the Sophie Gulch fault.

Alteration:

Albitization; sulfidization (especially introduction of arsenopyrite); and oxidation of arsenopyrite.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207. The earliest albite- and arsenopyrite-rich replacement deposits at Arsenic Hill are along ductile folds in the host schist. Sheeted, non-deformed quartz veins cut the deposits along the ductile folds.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Active?

Workings/exploration:

Placer gold was produced from the elevated bench deposit on the south end of the ridge (NM210); badly sloughed pits and shallow trenches reflect exploration before about 1920. The area has been explored, especially by trenching, sequentially since the 1980s by R.V. Bailey, Placer Dome, and Kennecott Exploration Company.

Production notes:

Reserves:

Additional comments:

References:

Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1978 (OFR 78-93).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Walsh Cut (Rock Creek)**Site type:** Mine**ARDF no.:** NM214**Latitude:** 64.6118**Quadrangle:** NM C-1**Longitude:** 165.4148**Location description and accuracy:**

This small lode and placer mine is on the east slope of Rock Creek valley at an elevation of about 350 feet and about 4,000 feet due east of the Snake River road. The map location is in the north-central part of section 23, T. 10 S., R. 34 W., Kateel River Meridian. Hummel (1962 [MF 247, locality 7]) mistakenly called this location Sophie. Sophie Gulch is about 600 feet northwest of the Walsh Cut. This mine is located to within about 250 feet.

Commodities:**Main:** Au**Other:** Ag, Pb, Sb, W (?)**Ore minerals:** Arsenopyrite, galena, pyrite, scheelite (?), scorodite, stibnite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

A hydraulic pit dating originally from before 1920 mined a residual placer developed on complex gold-arsenic deposits on the side hill above and southeast of Sophie Gulch. A narrow and irregular zone of northeast-trending sheeted quartz veins, subparallel to those of the Rock Creek deposit (NM207), underlies part of the pit. The pit walls also expose early arsenopyrite-albite zones localized by northwest-trending faults (?) and by nearly recumbent isoclinal folds whose axes trend northwest. The general northeasterly trend of the sheeted veins was explored by Placer Dome in 1987 and 1988 for a total strike distance of about 1,000 feet northeast from the hydraulic pit. Placer Dome and Kennecott Exploration Company also explored southwest from the pit. Additional sheeted veins were found, but they did not appear to be continuous with those northeast of Walsh Cut.

It appears that residual material mined in the pit was concentrated in a sluice box at the downslope end of the pit. The process was inefficient and low-grade alluvial fan deposits formed below the hydraulic operation (NM215). Material in the fan deposits indicates that arsenopyrite, partly oxidized to scorodite, was abundant in the residual deposit. Galena and stibnite have also been found in quartz below the hydraulic pit. Scheelite was probably recovered in the sluice operation.

Alteration:

Albitization.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-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: Probably inactive

Workings/exploration:

The character of the tailings indicates that there were at least two episodes of placer mining, one pre-1920 and the other possibly after World War II. Sheeted quartz veins projected northeast and southwest of the pit were explored by Placer Dome in 1987 and 1988 and by Kennecott Exploration Company in 1994. The locality was visited and mapped by Newmont Mining Company in about 1991 or 1992.

At least 15 holes have been drilled to explore the sheeted vein trend northeast of the pit; in approximate southwest to northeast order, these include Placer Dome reverse circulation holes 88-077 and 083; 88-051, -052, and -067; 88-068, -069, and -070; 88-071, -073, and -074; and 88-089. Placer Dome drilled one core hole (88-039) in the drill fence with 071, 073, and 074. Newmont drilled one core hole adjacent to Placer Dome 88-068.

Production notes:

Small production of gold and probably some scheelite by hydraulic methods.

Reserves:**Additional comments:****References:**

Hummel, 1962 (MF 247).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Walsh Cut (alluvial placer)**Site type:** Mine**ARDF no.:** NM215**Latitude:** 64.6118**Quadrangle:** NM C-1**Longitude:** 165.4172**Location description and accuracy:**

This gold-bearing alluvial fan is at the mouth of Walsh Cut (NM214), south of Sophie Gulch (NM208). The fan is as much as 500 feet long and as much as 300 feet across. Most of the fan is covered with vegetation typical of adjacent hill slopes, but the lower, sparsely vegetated fan resulted from placer mining operations at Walsh Cut (NM214). The lower fan extends almost to Rock Creek. The map site is in the north-central part of section 23, T. 10 S., R. 34 W., Kateel River Meridian. The location is accurate.

Commodities:**Main:** Au**Other:** Ag, Pb, W, Sb**Ore minerals:** Arsenopyrite, galena, gold, scheelite, scorodite, stibnite**Gangue minerals:** Quartz**Geologic description:**

Two distinct alluvial fans have formed below the mouth of Walsh Cut (NM214). The lower fan resulted from hydraulic operations in Walsh Cut. The upper and larger fan is covered with soil and vegetation. It could have formed in part from placer mining operations, but also from natural erosion of a residual placer that was later mined in Walsh Cut. Quartz boulders locally crop out in the upper fan. These boulders contain sulfides, principally arsenopyrite and more rarely galena and stibnite. They probably also contain scheelite. The upper fan extends between elevations of 230 and 320 feet and is as much as 300 feet across; it is about 450 feet long. The lower manmade fan extends between elevations of 205 and 230 feet and is as much as 250 feet across. It is only sparsely vegetated and contains abundant boulders and cobbles of quartz and sulfides. Soil samples collected from the fans locally exceed 1 ppm gold and are strongly anomalous in arsenic and other metals.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

The core of the older deposit could have formed from the erosion of a residual placer upslope at Walsh Cut. The lower and younger fan probably formed soon after World War II.

Production notes:

Reserves:

There is a low-grade resource of gold and other metals in the fan deposits.

Additional comments:

References:

This report.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (lode in lower Rock Creek)**Site type:** Occurrence**ARDF no.:** NM216**Latitude:** 64.6052**Quadrangle:** NM C-1**Longitude:** 165.4320**Location description and accuracy:**

This occurrence is on the southeast side of Rock Creek, about 600 feet upstream of the Snake River road crossing. Rock Creek is an east tributary to Snake River with headwaters on the south flank of Mount Byrnteson. The map location is just inside the west-central border of section 23, T. 10 S., R. 34 W., Kateel River Meridian. It is locality 30 of Hummel (1962 [MF 247]) locality 24 of Hummel (1962 [MF 243]) is also included here.

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Arsenopyrite, gold, pyrite, scheelite**Gangue minerals:** Albite, quartz**Geologic description:**

A massive quartz vein, as much as 4 feet wide, is exposed on the southeast side of Rock Creek about 600 feet upstream of the Snake River road (Hummel, 1962 [MF 247, locality 30]). Exposures on the south bank of Rock Creek between the quartz vein and the road locally also contain pyrite-arsenopyrite-bearing quartz veins (Hummel, 1962 [MF 247, locality 24]). These occurrences are separated from numerous other mineral deposits in the Rock Creek area by the Mount Brynteson fault. Hummel (1962 [MF 247]) mapped this nearly north-striking fault about one-half mile west of Mount Brynteson. The fault apparently continues southward to the Snake River flood plain. It also appears to have controlled the course of strongly linear Bergstrom Gulch. Hummel (1962 [MF 247]) reported the presence of gold and scheelite; arsenopyrite and pyrite are also present. Kennecott Exploration Company drilled two shallow reverse circulation holes in this area in 1994 or 1995 but found only low gold values.

Alteration:

Albitization and silicification.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

Quartz veins and sulfidized schist were explored by trenches and shallow shafts probably before 1920. Two prospects in the area between the Mount Brynnetson fault and the Glacier Creek road were noted by Hummel (1962, localities 24 and 30). The area was soil sampled by BHP in 1989; it is within the extensive arsenic-gold anomaly that extends almost continuously from Glacier Creek to north of Lindblom Creek. Kennecott Exploration Company drilled two reconnaissance reverse circulation holes in this area in 1995 but found only low gold values.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 247).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Stipek and Kotovic; Bergstrom (Rock Creek)**Site type:** Prospect**ARDF no.:** NM217**Latitude:** 64.6088**Quadrangle:** NM C-1**Longitude:** 165.4249**Location description and accuracy:**

This lode prospect is on the southeast side of Rock Creek about 3,000 feet upstream of the Snake River road and 1.85 miles south-southwest of Mount Brynteson. The prospect is at surface elevations of about 200 to 225 feet. The map location is in the NW1/4 section 23, T. 10 S., R. 34 W., Kateel River Meridian, and it is accurate to within 250 feet. This is locality 43 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Arsenopyrite, gold, ilmenite, pyrite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

This prospect was one of two known as Stipek and Kotovic; the second, on the divide between Rock Creek and Glacier Creek, is NM235. The east side of Rock Creek was evidently being prospected by W. Stipek and J. Kotovic in 1916, when it was visited by Mertie (1918 [B 662-I, p. 432-33]). Workings at that time consisted of a 70-foot shaft and 70 feet of crosscuts. The collar of the shaft was at an elevation of about 200 feet. A mineralized zone found in the crosscut was rich in sulfides and reported to strike N 5 E. Dump material contained 0.4 ounce of gold per ton; stringer sulfide zones without quartz reportedly contained about 7 ounces of gold per ton. A 120-foot-long adit, apparently examined by Mertie (1918), was driven from near the elevation of Rock Creek through the lode. Mertie (1918) reported that a 12-foot vein of shattered white quartz yielded about 250 pounds of concentrate to the ton. Sulfides, especially arsenopyrite, were abundant from the near the vein to the face of the adit. Another adit, 40 feet long, was driven into the lode about 75 feet to the south and apparently encountered the same vein and sulfide zone as the longer adit.

The prospect was inactive when visited by Cathcart in 1920 (Cathcart, 1922, p. 244-245). He reported that tunnels were driven S 75 E and S 25 E and that the quartz-albite vein had a strike of N 65 E and dipped 50 south. Ilmenite occurs on fracture surfaces in

the quartz. Wallrock was reported as chlorite-quartz schist, in general agreement with the findings of Bundtzen and others (1994), who mapped the bedrock on Rock Creek as chlorite-rich metaturbidite schist.

The prospect was explored between about 1985 and 1995 by R.V. Bailey, BHP (?), Newmont Mining Company, and Kennecott Exploration Company. This exploration included northwest-trending trenches that exposed stratiform, as well as crosscutting quartz and sulfides and a fault that may cut off the deposit. The trench and drill results show that the deposit is semi-continuous over a northeasterly strike length of about 500 feet, but the grade is low and individual mineral zones are discontinuous. In general, this deposit is similar to those at Reinisch (NM213), Walsh Cut (NM214), and Goodluck Gulch (NM202).

Alteration:

Albitization; extensive sulfidization especially introduction of arsenopyrite.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined.

Site Status: Probably inactive

Workings/exploration:

The Stipek and Kotovic prospect on Rock Creek was explored by a 70-foot shaft and about 230 feet of level adit or crosscut workings before 1920. It appears to have been active when visited by Mertie in 1916 (Mertie, 1918 [B 662-I, p. 425-449]). It was inactive in 1920. The prospect was again active between about 1985 and 1995. It was drilled and trenched by several companies including BHP(?) in 1990, Newmont in 1992, and Kennecott Exploration Company in 1994. Both core and reverse circulation holes were drilled in the appraisal of the prospect.

Production notes:

There possibly was production of minor free gold during milling tests of the ore.

Reserves:**Additional comments:****References:**

Mertie, 1918; Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb,

1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Ullrich (Judy and Deb Bench claims)

Site type: Mine

ARDF no.: NM218

Latitude: 64.6041

Quadrangle: NM C-1

Longitude: 165.3992

Location description and accuracy:

The William H. Ullrich placer mine is on the south-facing part of the ridge between Rock Creek and Glacier Creek. The map site is at the midpoint between the Judy and Deb Bench claims (U.S. Mineral Survey No. 2271) at an elevation of 350 feet on the boundary of sections 23 and 24, T. 10 S., R. 34 W., Kateel River Meridian. The location is accurate within 250 feet.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

A high-level (bench) gold placer was discovered and probably mined as recently as the 1960,s. The claims were surveyed for patent in 1976, and two were patented in 1977. The main placer pit is excavated subparallel to a south-trending gulch into Glacier Creek; it is on the Judy Bench. Numerous pits were excavated on the upper Deb Bench claim where there are sparsely scattered, rounded granitic boulders. Most of the production from the mine was from the lower Judy Bench, but exploration cuts and granitic boulders are found at least to about 650 feet elevation, similar to some of the high-level benches near Dexter (NM246, NM247, and NM248).

The origin of the high-level bench placers is uncertain, but they predate, and furnished placer gold to, younger alluvial placers such as Glacier Creek (NM220) and Anvil Creek (NM236).

Alteration:

Age of mineralization:

Probably Pleistocene; possibly Tertiary.

Deposit model:

Alluvial placer Au; high-level bench deposit (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; small

Site Status: Probably inactive

Workings/exploration:

The claims were mined hydraulically, probably as recently as the 1960s.

Production notes:**Reserves:****Additional comments:****References:**

U.S. Mineral Survey No. 2271 by Maurice Oswald, 1976, patent granted April 19, 1977 (available at the U.S. Bureau of Land Management, Anchorage).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Hot Air Bench (Columbia Mine)**Site type:** Mine**ARDF no.:** NM219**Latitude:** 64.5988**Quadrangle:** NM C-1**Longitude:** 165.4079**Location description and accuracy:**

The Hot Air Bench placer is on the north side of lower Glacier Creek. The coordinates are for the approximate midpoint of an open-cut mine 900 feet north-northwest of the mouth of Snow Gulch on the Columbia claim of the Hot Air Mining Company (U.S. Mineral Survey No. 403). The bench placer trends west-southwest, subparallel to Glacier Creek. It is included in locality 101 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). Hummel's (1962 [MF 247]) locality 7 is incorrect. The map location is in the NE1/4 section 26, T. 10 S., R. 34 W., Kateel River Meridian, and it is accurate to within 250 feet.

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Arsenopyrite, gold**Gangue minerals:****Geologic description:**

The Hot Air Bench appears to be a true bench of Glacier Creek. It is approximately 100 feet vertically above and 900 feet horizontally north of Glacier Creek. Two claims of the Hot Air Mining Company were located May 28, 1899, and August 17, 1900; the claims were patented in 1902 (U.S. Mineral Survey No. 403). Apparently the bench channel was very well defined for about 400 to 500 feet. According to Collier and others (1908, p. 193-194), who were in the area in 1903, the channel was about 100 feet wide and had well-defined bedrock rims. The channel gravels were at a depth of about 20 feet. Pay gravels, largely of schist and marble, were about 4 to 5 feet thick and rested on chloritic schist bedrock. Gold was described as similar to that in Glacier Creek (NM220): fine, bright, and well rounded. The well-defined channel apparently played out to the west and turned toward Glacier Creek to the east. Moffit (1913, p. 85-86) reported veins as much as 6 inches thick in bedrock below the channel in the direction of Snow Gulch. He proposed that the source of the placer gold was local. Cathcart (1922, p. 243), in contrast, did not believe the gold was local, a conclusion that appears borne out by the character of the gold reported by Collier and others (1908). Cathcart (1922) also reported that the

schist contained arsenopyrite.

The Hot Air Bench was extremely rich. Historic photographs show rows of gold bars cast from Hot Air gold. Collier and others (1908) reported that the production was 'not less than \$600,000' (about 30,000 ounces of gold) and that pay in the best part of the channel ran about 2.5 ounces of gold per cubic yard. Assuming the fairly common 900 fineness value of placer gold in this area, the placer also produced about 3,000 ounces of silver. Collier and others (1908) also reported that placer gold was found higher on the slopes, a report consistent with the later discovery of the Ullrich placer (NM218) above and upstream of Hot Air Bench.

Alteration:

Age of mineralization:

Pleistocene.

Deposit model:

Alluvial placer Au; elevated bench formed on ancestral Glacier Creek (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes

Site Status: Inactive

Workings/exploration:

The first bench claims were located in 1899; mining commenced immediately. The claims were surveyed for patent in 1901, at which time there was a small open cut on the Columbia claim. The richest part of the placer was mined by 1903, when the area was visited by Collier and others (1908). The deposit was mainly mined hydraulically; gold was recovered in a narrow sluice set in the downstream section towards Glacier Creek.

Production notes:

Total production is believed to have been at least 600,000 dollars (gold at 20.67 dollars per ounce) or about 30,000 ounces of gold and 3,000 ounces of silver.

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Glacier Creek (includes Bonanza and Bergstrom Gulches)

Site type: Mine

ARDF no.: NM220

Latitude: 64.5970

Quadrangle: NM C-1

Longitude: 165.4195

Location description and accuracy:

Glacier Creek is an east tributary to Snake River. It has been placer mined over a distance of at least 7,000 feet, starting at an elevation of about 75 feet downstream of the Snake River road crossing and extending upstream to an elevation of about 125 feet. The map location is at the approximate midpoint of the placer workings, in the NW1/4 section 26, T. 10 S., R. 34 W., Kateel River Meridian. This is locality 101 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Ag, Sn, W

Ore minerals: Cassiterite, gold, scheelite

Gangue minerals: Garnet

Geologic description:

Significant placer mining took place on Glacier Creek starting in 1900 when more than 36,000 ounces of gold were produced (Brooks and others, 1901). Mining continued to at least 1922 and included dredge operations from 1916 to 1922 (Cobb, 1978 [OFR 78-93]). About 1.4 miles of the creek have been placer mined, in places more than once, starting 1 mile above the mouth and extending upstream to beyond Snow Gulch (NM222). The lower part of the creek, in the Snake River valley, contained fine gold throughout 10 to 15 feet of gravel and in 2 to 3 feet of creviced bedrock in a 300-foot-wide pay streak (Collier and others, 1908). Near the mouth of Snow Gulch (NM222), the 6 feet of gravel over schist bedrock was gold-bearing, although richest in the lower 2 feet (Brooks and others, 1901). About one mile below the mouth of Snow Gulch, the placer was about 20 feet thick on chloritic schist bedrock and the paystreak about 300 feet wide. About the upper 3 feet of the schist was also gold-bearing. The gold was reported as fine, bright, and well-rounded (Collier and others, 1908, p. 193). The heavy mineral concentrate contained garnet, scheelite, and cassiterite (Brooks and others, 1901; Anderson, 1947). Some scheelite was recovered by dredge operations during WW I and from a residual placer (NM221) on the north side of the creek (Mertie, 1918 [B 662-!, p. 425-449]). Gold-bearing quartz

veins and stringers in sulfidized schist were also identified along the north side of the creek valley, where rich bench placer deposits containing coarse gold were mined (NM219). An occurrence of mineralized bedrock near the mouth of Snow Gulch (NM221) reportedly is concordant to schistosity. The occurrence consists of sulfide-bearing quartz veins separated by sulfide-rich schist.

The deposit was discovered in 1898. Mining began soon afterward. Mining in 1900 in Glacier Creek and adjacent parts of Snow Gulch produced 750,000 dollars or more than 35,000 ounces of gold (Brooks and others, 1901, p. 69). The existence of scheelite in the concentrates was reported at this time. The recovered gold had a fineness of about 900 (Purinton, 1905, p. 209).

Mining appears to have progressed through shovel-in operations to hydraulic elevators, other hydraulic operations, and then to dredging. Brooks (1904) reported the installation of hydraulic elevators in 1903. A dredge was in operation at least by 1916 (Mertie, 1918, p. 452, 455); dredge operations were reported up to at least 1922 (Brooks and Capps, 1924). Some of the ground was rich. Collier and others (1908, p. 193) thought ground mined prior to 1903 contained more than 5.00 dollars per cubic yard (about 1/4 ounce of gold per cubic yard). In 1916, a period of high tungsten prices during World War I, scheelite was saved in dredge concentrates from this mine as well as at the Lynx (NM221) lode claim (Mertie, 1918, p. 457). Coats (1944) considered Glacier Creek to be potentially important as a scheelite resource. Anderson (1947) reported scheelite and cassiterite in the placer concentrates and stibnite in nearby lodes.

The sources of placer gold in Glacier Creek appear to include nearby older bench placer deposits to the north of Glacier Creek, Snow Gulch, upper Glacier Creek and in lower Glacier Creek, Bonanza Gulch and Bergstrom Gulch.

Bedrock along Glacier Creek is locally graphitic chloritic schist and some marble (Collier and others, 1908, p. 193). The nearest bedrock mapped by Bundtzen and others (1994) is chlorite-rich metaturbide schist and marble. The bedrock is probably is probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Glacier Creek was an early discovery in the Nome district. Claims were staked covering part of Glacier Creek and lower Snow Gulch on September 20 and November 28, 1898, by the Pioneer Mining Company owned by Lindeberg, Lindblom, and Brynteson. Claims on the lower part of Glacier Creek were located as early as October 19 and November 2 and 28 in 1898. These claims, known as No. 1, 2, and 3 Below Placer and the Joe Bench claim were patented to the Miocene Ditch Company in 1912. The Miocene Ditch Company was closely related to Pioneer Mining Company. One unpatented claim, the Utica, separated the upper (Snow Gulch) and lower Glacier Creek claims.

Production notes:

Production from as early as 1900 through 1922; possibly some activity in the 1930s. Production cannot be subdivided, but more than 750,000 dollars worth of gold (35,000 ounces) was recovered in 1900.

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Brooks, 1904; Purington, 1905; Collier and others, 1908; Mertie, 1918 (B 662-I); Brooks and Capps, 1924; Coats, 1944; Anderson, 1947; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Lynx Claim; Glacier Creek**Site type:** Mine**ARDF no.:** NM221**Latitude:** 64.5985**Quadrangle:** NM C-1**Longitude:** 165.4058**Location description and accuracy:**

The Lynx claim is at an elevation of about 150 feet on the north bank of Glacier Creek, opposite the mouth of Snow Gulch (NM222). The map location is in the NE1/4 section 26, T. 9 S., R. 10 W., Kateel River Meridian and it is probably accurate to within about 500 feet. It is included in locality 101 of Cobb (1972 [MF-463], 1978 [OFR 78-93]).

Commodities:**Main:** Au, W**Other:****Ore minerals:** Arsenopyrite, gold, pyrite, scheelite**Gangue minerals:** Albite, quartz**Geologic description:**

This deposit consists of sulfide- and scheelite-bearing quartz veins, layers, and lenses as much as 6 inches thick separated by sulfide-bearing schist. The quartz bodies are parallel to the foliation in the schist. The deposit was first reported by Collier and others (1908, p. 193) as a gold prospect. Selected samples contained as much as 0.5 ounce of gold per ton. The same locality was probably reported as the Lynx claim by Mertie (1918 [B 662-I, p. 457]). The deposit was developed by a 60-foot shaft. Scheelite, quartz, and sulfidized schist were run through a sluice box, and about 600 pounds of scheelite were recovered. A dredge working below the deposit recovered scheelite in placer gold concentrates. Cathcart (1922, p. 241) reported a 20-foot-long adit at about the same location. The adit exposed a 1-foot quartz-feldspar vein within highly sulfidized schist walls. Cathcart (1922, p. 234, 241-242) described other nearby deposits, including mineralized schist similar to Sophie Gulch (NM208), in a gully south of Glacier Creek immediately above Snow Gulch. At that location, a quartz-feldspar vein cuts contorted sulfidized schist. Anderson (1947) reported scheelite and stibnite in prospects in the Glacier Creek--Snow Gulch area.

Alteration:

Albitization; introduction of pyrite and arsenopyrite in schist.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Inactive

Workings/exploration:

A 60-foot shaft and several short adits were driven during or before 1920; the deposit was discovered before 1903 (Collier and others, 1908).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Mertie, 1918 (B 662-I); Cathcart, 1922; Anderson, 1947; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Snow Gulch**Site type:** Mine**ARDF no.:** NM222**Latitude:** 64.5939**Quadrangle:** NM C-1**Longitude:** 165.4000**Location description and accuracy:**

This alluvial placer gold mine is on Snow Gulch, a south tributary to Glacier Creek. The mouth of Snow Gulch is about 3,400 feet upstream of the Snake River road crossing of Glacier Creek, and part of the Snake River road parallels Snow Gulch about 500 feet to the west. Essentially all of Snow Gulch has been placer mined, and the location, at an elevation of about 250 feet, is the approximate midpoint of the placer workings. This location is just inside the east-central border of section 26, T. 10 S., R. 34 W., Kateel River Meridian. It is included in locality 101 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Gold, scheelite**Gangue minerals:** Garnet**Geologic description:**

This small south tributary to Glacier Creek (NM220), only about three quarters of a mile long, contained one of the richest gold placers on Seward Peninsula and produced more than 48,000 ounces of gold around 1900; the first claims on the creek were staked in 1898 (Schrader and Brooks, 1900; Brooks and others, 1901). It was mined and remined between 1899 and 1903 and still is mined on a small scale. The gold was distributed throughout 3- to 4-foot-thick gravels. In many places, the deposit was cleaned to bedrock and in 1903, when visited by the U.S. Geological Survey, there was little potential for further mining (Collier and others, 1908, p. 195). Snow Gulch contains significant amounts of placer scheelite, and some has been recovered (Coats, 1944). Coats (1944) considered Snow Gulch one of the more important tungsten localities in the Nome district. The source of the placer deposits is mainly lodes near the head of the gulch. The upper south fork of Snow Gulch heads in an area where lode prospects were found as early as 1899 (U.S. Mineral Survey No. 775); the upper north fork heads easterly into a complex sheeted vein zone (Saddle zone, NM233). Bedrock in the area is schist and some marble that probably has an early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury,

Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Largely worked out by 1903, but some small-scale mining continues to the present. It was a shallow placer amenable to hand and simple hydraulic mining.

Production notes:

Snow Gulch was one of the richest gold placers on Seward Peninsula. More than 48,000 ounces of gold were produced around 1900, and there has been minor unrecorded production to the present.

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Brooks and others, 1901; Collier and others, 1908; Coats, 1944; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Brooks, Richardson and Collier, 1901

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Saddle; New Era; Big Four**Site type:** Prospects**ARDF no.:** NM223**Latitude:** 64.5912**Quadrangle:** NM C-1**Longitude:** 165.3870**Location description and accuracy:**

This site represents several closely related lode deposits in the headwaters of Snow Gulch, especially above the split of the gulch into two headward forks. The map location is on the Saddle deposit developed above the north fork of Snow Gulch, at an elevation of 450 feet in the SW1/4 section 25, T. 10 S., R. 10 W., Kateel River Meridian. These deposits are included in locality 46 of Cobb (1972 [MF 463], 1978 [OFR 78-93]), and locality 1 of Hummel (1962 [MF 247]).

Commodities:**Main:** Au**Other:** Ag, Sb, W**Ore minerals:** Arsenopyrite, galena, gold, pyrite, scheelite, stibnite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

The Saddle deposit is of sheeted vein type; it trends northeasterly from near the west portal of the Miocene Ditch tunnel nearly to the top of hill elevation 691. Other gold-bearing veins were developed in the south fork of upper Snow Gulch. One prospect in this group appears to lie on the Bernice No. 1 lode of John Leedy (U.S. Mineral Survey No. 775); the New Era tunnel is also in this vicinity. Another related vein zone possibly exists on the divide between Snow Gulch and Anvil Creek, nearly in line with the trend of Snow Gulch.

Prospecting dating back to at least 1899 has identified several gold lodes near the head of Snow Gulch. The older prospects, such as New Era and Big Four, are difficult to identify, but they can be approximately located. These vein and stratabound mineral occurrences are abundant in upper Snow Gulch and appear to be the main source of placer gold in Snow Gulch.

A prospector named John Leedy located claims on the east side of Snow Gulch and on Bonanza Hill from July 1899 until 1908; his claims were patented in 1908 (U.S. Mineral Survey No. 775). A stamp mill was moved into this area and various tunnels and workings were driven, including the New Era tunnel, reported to be more than 300 feet long.

The tunnel was driven on a lode that strikes northeast and dips 40 northwest (Chapin, 1914, p. 400-401). The gold is in pyrite and arsenopyrite. The sulfides are disseminated in schist that is cut by quartz, minor albite, and locally calcite veinlets.

The New Era tunnel, caved when visited by Chapin, appears to be near Placer Dome trenches ST-88-06, -08 and -010. These trenches expose zones containing more than 0.1 ounce of gold per ton. Mertie (1918, p. 433-434) examined this area in 1916. He repeated Chapin's description of the New Era tunnel, but was able to examine the Big Four shaft. He reported that this shaft was on the east side of Snow Gulch at an elevation of about 500 feet. Quartz stringers in a 60-foot-wide zone in marble strike about N 65 E and contain crystalline gold in vugs in quartz. This area was also described by Cathcart (1922, p. 243-244).

The Saddle deposit, mainly explored between 1986 and 1995, appears to start west of the portal of the Miocene Ditch tunnel and to continue northeasterly for about 1,300 feet. This deposit has been explored by shallow trenches and drill holes. It is irregular but is as much as 200 feet wide. The Saddle deposit is less consistently mineralized than the Rock Creek sheeted zone (NM207), but a small body of material averaging about 0.05 ounce of gold per ton has been identified, and probably more could be developed. Other trenching and shallow drilling suggest that gold-bearing veins are also present in a west-southwest-trending zone west of the portal of Miocene tunnel. The apparent strike length of the zone is about 1,200 feet. This zone probably includes the New Era deposit.

An isolated deposit, about 1,200 feet northeast of Saddle, was found by Newmont in 1992, and a deposit at the ridge between Snow Gulch and Anvil Creek was intersected in three Placer Dome trenches (ST-88-3, -4, and -5). The deposit in these trenches can be projected about 300 feet on strike.

Bedrock in the area is schist and some marble, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). Strata exposed in upper Snow Gulch and continuing southward on Bonanza Hill are chloritic mica-schist, marble, with occasional graphitic units. In general they belong to the chlorite-rich metaturbidite schist and marble unit of Bundtzen and others (1994).

Alteration:

Albitization, silicification, and sulfidization of schist.

Age of mineralization:

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Active?

Workings/exploration:

Lode prospects were located in this area as early as 1899; there was considerable lode prospecting activity until World War I. In the mid-1980's, R.V. Bailey discovered the Saddle deposit and began a trenching program that identified a sheeted vein complex. This exploration was followed by an extensive trenching program and some drilling by Placer Dome in 1987 and 1988, by soil geochemistry and some drilling by BHP in 1990, by detailed mapping and some drilling by Newmont Mining Company in 1992, and by additional drilling by Kennecott Exploration Company in 1994-5.

Production notes:**Reserves:****Additional comments:****References:**

Chapin, 1914; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Trench 7--Divide Zone (Bonanza Hill)**Site type:** Prospect**ARDF no.:** NM224**Latitude:** 64.5833**Quadrangle:** NM C-1**Longitude:** 165.3941**Location description and accuracy:**

The Trench 7--Divide deposit is at an elevation of 450 to 465 feet about 1,200 to 1,500 feet due east of the rounded top of Bonanza Hill. The map location is in the northwest corner of section 36, T. 10 S., R. 34 W., Kateel River Meridian, and it is accurate.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, gold (?), pyrite**Gangue minerals:** Albite, calcite, quartz**Geologic description:**

The Trench 7--Divide deposit was identified from exploration by BHP in 1990 and by Newmont Mining Company in 1992; there are some old trenches and cuts of uncertain age on the deposit. The area was mapped by Thomas Borovicka for Newmont in 1992; his map was modified for Kennecott Exploration Company by C.C. Hawley in 1993 and 1994.

The Trench 7--Divide deposit appears to be bounded on the northwest by a steep fault that strikes N 50 E. The apparent displacement, evidenced by offset of a calcareous quartz-mica schist layer, is about 10 feet. Southeast of the fault, the deposit is about 200 feet across. Locally, there are sheeted veins of calcite and quartz; older sloughed trenches show accumulations of vein quartz boulders. The deposit is irregular; locally it contains 0.05 to 0.07 ounce of gold per ton. It is possible that the deposit continues to the northeast to Placer Dome trenches 88-3, -4 and -5 (NM223). Bonanza Hill is mainly underlain by nearly horizontal calcareous quartz-muscovite schist and marble probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Mid-Cretaceous; veins cross cut regionally metamorphosed schist; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (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:

This prospect has been explored by numerous trenches and shallow drill holes.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Hendrickson; Kotovic and Stipek (Anvil Creek)**Site type:** Prospect**ARDF no.:** NM225**Latitude:** 64.5823**Quadrangle:** NM C-1**Longitude:** 165.3881**Location description and accuracy:**

This lode prospect is at an elevation of about 350 feet on the northwest side of Anvil Creek and 400 feet due east of the Snake River road. It is about 3,800 feet southeast of Bonanza Hill (elevation 640 feet). This prospect is included in locality 48 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and locality 5 of Hummel (1962 [MF 247]). The map location is in the NW1/4 section 36, T. 10 S., R. 34 W., Kateel River Meridian. Its accuracy is uncertain but it probably is located to within about 500 feet.

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Arsenopyrite, gold, pyrite, stibnite**Gangue minerals:** Quartz**Geologic description:**

The Hendrickson prospect is within or near the Anvil Creek fault and related shear zones that are as much as 120 feet wide. The deposit consists of quartz-calcite veins that contain arsenopyrite, pyrite, and locally stibnite. The veins commonly cut schist or are localized in shear zones (Collier and others, 1908; Brooks, 1916; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). Pyrite and arsenopyrite also are disseminated in schist peripheral to veins and sulfide-rich zones as much as 15 feet wide are known. Vein samples from this prospect contained a little more than 0.5 ounce of gold per ton (Cathcart, 1922, p. 238). The Anvil Creek fault is a high-angle structure that juxtaposes different types of graphitic schist and dark graphitic quartzite in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; vein cross cuts schist metamorphosed during the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined.

Site Status: Active?

Workings/exploration:

This prospect was explored by a 150-foot adit that was partially caved by 1916 (Cathcart, 1922). In 1916, the total length of underground workings on lode gold prospects in Anvil Creek valley was several hundred feet (Mertie, 1918).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Brooks, 1916; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Widstedt (Anvil Creek)**Site type:** Prospect**ARDF no.:** NM226**Latitude:** 64.5800**Quadrangle:** NM C-1**Longitude:** 165.3975**Location description and accuracy:**

The Widstedt prospect is at an elevation of about 250 feet in a small drainage on the south flank of Bonanza Hill (elevation 640 feet) and about 500 feet due west of the Snake River road. It is locality 20 of Hummel (1962 [MF 247]) and included in locality 48 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The map location is just inside the west-central boundary of section 36, T. 10 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Arsenopyrite, gold, pyrite, stibnite**Gangue minerals:** Quartz**Geologic description:**

The Widstedt prospect lies within or near the Anvil Creek fault and related shear zones that are as much as 120 feet wide. The deposit consists of quartz-calcite veins that contain arsenopyrite, pyrite, and locally stibnite.

The veins commonly cut schist or are localized in shear zones (Collier and others, 1908; Brooks, 1916; Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). Pyrite and arsenopyrite also are disseminated in schist adjacent to the veins, and some sulfide-rich zones are as much as 15 feet wide. Stibnite lenses with little quartz occur at this prospect and some stibnite ore has reportedly been produced (Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). Material from a dump next to a water-filled shaft consisted of finely crystalline stibnite associated with pyrite and arsenopyrite in small veinlets cutting quartz and schist. An open cut exposed a 12 foot-wide zone of quartz stringers cut by veinlets of finely crystalline stibnite.

The Anvil Creek fault is a through-going high-angle structure that in this area juxtaposes different types of graphitic schist and dark graphitic quartzite in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Mid-Cretaceous; vein cuts schist metamorphosed during the mid-Cretaceous; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a) and/or possibly simple Sb deposits (Cox and Singer, 1986; model 27d).

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

36a, 27d?

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

An exploration shaft was filled with water by 1920; some open-cut surface workings are also present (Cathcart, 1922). In 1916, the total length of underground workings on lode gold prospects in Anvil Creek valley was several hundred feet (Mertie, 1918 [B 662-I, p. 425-449]).

Production notes:

A small amount of antimony ore is reported to have been mined from the Widstedt prospect (Mertie, 1918 [B 662-I, p. 425-449]).

Reserves:**Additional comments:****References:**

Collier and others, 1908; Brooks, 1916; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Scotia (Anvil Creek)**Site type:** Prospects**ARDF no.:** NM227**Latitude:** 64.5785**Quadrangle:** NM C-1**Longitude:** 165.3994**Location description and accuracy:**

The Scotia prospect is at an elevation of about 250 feet on the northwest side of Anvil Creek, and its about 300 feet southwest of the Snake River road switchback where it crosses Anvil Creek. The prospect is locality 16 of Hummel (1962 [MF 247]). The map location is just inside the east-central boundary of section 35, T. 10 S., R. 34 W., Kateel River Meridian; it is probably accurate to within 500 feet.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Arsenopyrite, pyrite**Gangue minerals:** Calcite, quartz**Geologic description:**

The Scotia prospect is probably within sheared wallrock near the Anvil fault. Cathcart (1922, p. 239) reported that an 8-inch quartz-calcite vein occurred in a short tunnel on the Scotia claim; pyrite and arsenopyrite were present in both schist and vein material. Bedrock in the general area is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 196 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Mid-Cretaceous or younger; vein cuts schist and marble metamorphosed during the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins? (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:

A 10-foot tunnel was reported by Cathcart (1922, p. 239).

Production notes:

Reserves:

Additional comments:

References:

Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Bonanza Hill; Gold Bug; Golden Eagle**Site type:** Prospects**ARDF no.:** NM228**Latitude:** 64.5905**Quadrangle:** NM C-1**Longitude:** 165.4145**Location description and accuracy:**

The Gold Bug and Golden Eagle prospects reportedly are at an elevation of about 400 feet, halfway between Mountain Creek and Snow Gulch. This prospect, about 2,200 feet northwest of the top of Bonanza Hill, was shown as locality 3 by Hummel (1962 [MF 247]). The locality is included with the Jorgensen and other nearby claims in locality 47 of Cobb (1972 [MF 463], 1978 [OFR 78-9]). The map location is just south of the center of section 26, T. 10 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, gold, hematite, limonite, pyrite**Gangue minerals:** Feldspar (albite?), quartz**Geologic description:**

Mertie (1918, p. 434) reported that country rock schist at the locality strikes N 32 W and dips 25 S. At the time of Mertie's visit, a 125-foot tunnel had been driven on a 6-foot vein of iron-stained quartz that contained iron sulfides. The vein strikes N 70 E and dips 45 S. According to Mertie, the assays taken at the breast indicated rather high-grade ore. Cathcart (1922, p. 241) reported an 8-inch vertical quartz-feldspar vein at the tunnel face in soft, highly altered schist, free gold in hematitic schist, and small amounts of pyrite and arsenopyrite. The location of the tunnel was not found in 1994, but a quartz-rubble field near a sloughed trench is present at this location (C.C. Hawley, unpublished data, 1994). The quartz rubble appears to lie on schist between two horizontal marble layers. Newmont Mining Company drilled one hole in this area (BR92-010) with unknown results. About 800 feet to the west, schist and marble are moderately dipping, possibly dragged by a nearby fault. Bedrock in the general area is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF-247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Mid-Cretaceous or younger; vein cuts schist metamorphosed during the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined.

Site Status: Inactive

Workings/exploration:

An adit, variously reported as 120- or 125-foot long, was reported by Mertie (1918 [B 662-I, p. 425-449]) and Cathcart (1922); there are two sloughed trenches and a recent drill hole (Newmont Mining Company, unpublished report, 1992) in the area. The area is near the head of Bonanza Gulch, a narrow paystreak, which appears to have supplied placer gold to lower Glacier Creek (NM220).

Production notes:**Reserves:****Additional comments:**

Chapin (1914, p. 401) proposed that the vein exposed on the Gold Bug and Golden Eagle claims is the same as the vein at the New Era tunnel. This assertion is doubtful, because extensive trenching and some drilling indicate that veins in this area are discontinuous.

References:

Chapin, 1914; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Jorgensen; Mountain Creek; Mary's Gulch**Site type:** Mine**ARDF no.:** NM229**Latitude:** 64.5847**Quadrangle:** NM**Longitude:** 165.4217**Location description and accuracy:**

This site includes lode and placer deposits in the Mountain Creek, Mary Gulch, and Nellie Gulch area. The Jorgensen lode claims appear to underlie part of the Mountain Creek placer deposit at an approximate elevation of 250 feet. The map location is at an elevation of 200 feet in Mary Gulch, in the NW1/4 section 35, T. 10 S., R. 34 W., Kateel River Meridian. This location is probably accurate to within 250 feet. The Mary's Gulch No. 3 placer claim (U.S. Mineral Survey No. 781) appears to be on what is now called Nellie Gulch, about one-half mile farther west and at an elevation of about 50 feet. The Jorgensen lode claims (unpatented) and the Mountain Creek placer (patented, U.S. Mineral Survey No. 710) are essentially the same as locality 8 of Hummel (1962 [MF 243]). The Jorgensen prospect was included in locality 47 of (Cobb, 1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag, Pb, W**Ore minerals:** Arsenopyrite, galena, gold, hematite, pyrite, scheelite**Gangue minerals:** Feldspar, quartz**Geologic description:**

The placer gold deposit in Mountain Creek, discovered in September, 1898, by E.O. Lindblom and his associates, was probably the first important placer discovery in the Nome district. A narrow gulch placer deposit on the creek appears to have been mined by 1905, although there may have been more mining after completion of the Miocene Ditch. Mountain Creek follows a steep, west-northwest-striking fault (C.C. Hawley, unpublished data, 1994). The fault cuts chlorite-rich metaturbidite schist and marble (Bundtzen and others, 1994); on the basis of the displacement of a marble layer, the apparent vertical movement on the fault is about 25 feet. At the Jorgensen prospect, Mertie (1918, p. 434-435) described a steep, N 65 W fault, as well as vertical quartz veins and stringers that cut the schist. Arsenopyrite is especially abundant in the schist along the fault. Panning recovered free gold that was fine, even-grained and heavily iron-stained. Joint planes (N

30 E, 70 N) in sulfidized schist along the fault are conspicuously iron-stained. Mertie (1918) believed that the Jorgensen deposit proved that gold was associated with sulfidized schist and had little to do with the introduced quartz. He found scheelite in an iron-stained quartz vein. The same locality was visited in about 1920 by Cathcart (1922, p. 240-241), who reported mine workings in mineralized schist and bleached marble. He identified the gangue feldspar as oligoclase, rather than albite. Pyrite, arsenopyrite, and galena occur in veins cutting quartz. Quartz veins in marble are nearly concordant but locally cut the layering; they contain less galena than veins in the schist. Like Mertie, Cathcart believed that most of the gold was introduced in a later sulfide-rich event. The structural history of the deposit is complex. It could include an early ductile event, followed by a brittle event marked by opening and reopening of the northeast-striking veins and stringers. Ore paragenesis may include (1) semiconcordant weakly auriferous quartz-feldspar-galena veins, (2) faulting, and (3) auriferous sulfidization of schist and introduction of gold in late veinlets.

Alteration:

Albitization; bleaching and silicification of marble; and sulfidization of schist.

Age of mineralization:

Mid-Cretaceous; veins cut schist and marble metamorphosed during the mid-Cretaceous; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a); partly residual gold placer (model 39a).

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

36a, 39a

Production Status: Yes**Site Status:** Inactive**Workings/exploration:**

These placer and lode deposits have been explored by shallow cuts and trenches. The Mountain Creek placer was located on September 9 and 19, 1898, recorded on October 18, 1898, and amended on October 22, 1900. A narrow, linear placer mine had been developed for at least 2,000 feet below the forks in the uppermost creek by the date of patent survey in November 1905 (U.S. Mineral Survey No. 710). The discovery in Mountain Creek was apparently the first made by E.O. Lindblom and his associates, the so-called Lucky Swedes. They must have been skillful and extremely hard-working prospectors because they also discovered Snow Gulch, Glacier Creek, and Rock Creek before they made their important discovery on Anvil Creek on September 22, 1898. The Miocene Ditch was ultimately extended to give a source of hydraulic water for the Mountain Creek mine. In 1916, Mertie (1918 [B 662-I, p. 425-449]) found prospector A.C. Jorgensen prospecting a lode beneath the previously mined placer. The general area was prospected

by Newmont Mining Company in 1992.

Production notes:

Gold has been produced from the Mountain Creek placer and from weathered material over the in-situ lode.

Reserves:

Additional comments:

References:

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Peterson and Lamoreaux (Banner Peak)**Site type:** Prospects**ARDF no.:** NM230**Latitude:** 64.5735**Quadrangle:** NM C-1**Longitude:** 165.4208**Location description and accuracy:**

These are two Peterson and Lamoreaux prospects, one at 650 feet elevation and one at 550 feet elevation, on Banner Peak. This is about the same as locality 13 of Hummel (1962 [MF 247]) and locality 50 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The map location is in the SW1/4 section 35, T. 10 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Pb, Sb**Other:** Au (?)**Ore minerals:** Galena, stibnite**Gangue minerals:** Quartz**Geologic description:**

Banner Peak is underlain mainly by graphitic quartz schist (quartzite) faulted to the north against chlorite-rich metaturbidite schist and marble (Bundtzen and others, 1994). The Peterson and Lamoreaux quartz prospect is at an elevation of 650 feet in graphitic schist and within about 200 feet of the fault. Mertie (1918, p. 432) reported that the quartz body had a strike of N 45 E and a dip of 45 N, and was at least 8 feet thick, and irregularly bounded. The quartz is nearly white and not banded and contains sparsely disseminated galena. The Peterson and Lamoreaux antimony prospect is at an elevation of 550 feet, but its location is uncertain. It is in schist and reportedly produced 1,500 pounds of stibnite ore (Mertie, 1918, p. 439).

Alteration:**Age of mineralization:**

Probably mid-Cretaceous; Mertie (1918 [B 662-I, p. 425-449]) thought the vein quartz could be old and possibly related to metamorphism; see NM207.

Deposit model:

Low-sulfide Au-quartz vein (Cox and Singer, 1986, model 36a); simple Sb deposits?

(Cox and Singer, 1986; model 27d).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a, 27d?

Production Status: Undetermined

Site Status: Inactive

Workings/exploration:
Open cuts and shallow shafts were developed before 1916.

Production notes:
About 1,500 pounds of antimony ore reportedly were produced from the Peterson and Lamoreaux antimony deposit (Mertie, 1918 [B 662-I, p. 425-449]).

Reserves:

Additional comments:

References:
Mertie, 1918 (B 662-I); Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Mohawk (Banner Peak)**Site type:** Prospect**ARDF no.:** NM231**Latitude:** 64.5719**Quadrangle:** NM C-1**Longitude:** 165.4334**Location description and accuracy:**

The Mohawk lode prospect is on the west flank of Banner Peak at an elevation of about 400 feet. The map location is at the southeast corner of section 34, T. 10 S., R. 34 W., Kateel River Meridian. The prospect is locality 10 of Hummel (1962 [MF 247]); the location is probably accurate to within 500 feet.

Commodities:**Main:** Au (?)**Other:****Ore minerals:** Arsenopyrite, pyrite, pyrrhotite (?)**Gangue minerals:****Geologic description:**

The country rock at the Mohawk prospect is mainly graphitic schist and graphitic quartzite (Bundtzen and others, 1994). Shallow pits expose schist containing disseminated pyrite, arsenopyrite, and possibly pyrrhotite.

Alteration:

Sulfidization of schist.

Age of mineralization:

Mid-Cretaceous or younger; superimposed on schist metamorphosed during the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins? (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:

Shallow exploration pits at this prospect date from before 1920; reconnaissance work was done here in 1992 by Newmont Mining Company.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 247).

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (near VABM 592, south of Banner Peak)

Site type: Occurrence

ARDF no.: NM232

Latitude: 64.5644

Quadrangle: NM C-1

Longitude: 165.4369

Location description and accuracy:

This occurrence is at an elevation of 400 to 500 feet on the southwest flank of Banner Peak. It is about 800 feet southwest of VABM 592 in the east-central part of section 3, T. 11 S., R. 34 W., Kateel River Meridian. It is locality 28 of Hummel (1962 [MF-247]).

Commodities:

Main: Au

Other: Pb, Sb

Ore minerals: Arsenopyrite, galena, pyrite, stibnite

Gangue minerals: Albite, quartz

Geologic description:

Hummel (1962 [MF 247]) described old prospect pits south of Banner Peak near hill elevation 592 that contained lead- and antimony-bearing minerals, presumably galena and stibnite. The area was included in a soil geochemical survey conducted by BHP in 1990 and was anomalous in arsenic and gold. Drilling and trenching in 1992 by Newmont Mining Company identified replacement masses of tabular albite almost pegmatoid in appearance. These masses contained arsenopyrite and assayed as much as 0.25 ounce of gold per ton in zones as much as 5 feet thick. The masses appear to be podiform, and continuity was not demonstrated. They resemble the albitic replacement deposits at Alpha Ridge (NM171), Goodluck Gulch (NM202), and the Walsh Cut (NM214) at Rock Creek. Country rock in the area south of Banner Peak is mainly graphitic schist and quartzite (Bundtzen and others, 1994).

Alteration:

Albitization.

Age of mineralization:

Mid-Cretaceous or younger; superimposed on schist metamorphosed during the mid-Cretaceous.

Deposit model:

Albitic replacements in schist; allied to Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: No

Site Status: Inactive

Workings/exploration:

Old exploration pits and trenches are of pre-1920 vintage. A soil geochemical survey was completed in 1990 by BHP, and trenching and drilling was done in 1992 by Newmont Mining Company.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 247); Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Olsen (Anvil Creek)**Site type:** Prospect**ARDF no.:** NM233**Latitude:** 64.5757**Quadrangle:** NM C-1**Longitude:** 165.3962**Location description and accuracy:**

The Olsen lode prospect is at an elevation of about 200 feet on the east side of Anvil Creek. It is 1,000 feet south of the Snake River road switchback where it crosses Anvil Creek and about one-quarter mile south of the mouth of Specimen Gulch. The map location is in the SW1/4 section 36, T. 10 S., R. 34 W., Kateel River Meridian. This is locality 12 of Hummel (1962 [MF 247]). The location is accurate within 500 feet.

Commodities:**Main:** Au, Sb**Other:** Cu**Ore minerals:** Gold, pyrite, stibnite**Gangue minerals:** Quartz, talc (?)**Geologic description:**

The Olsen prospect consists of two long-abandoned shafts sunk on the east side of Anvil Creek. The workings date from the early 1900's (Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). A 54-foot shaft was sunk on a north-northwest striking, west-dipping quartz vein. According to the owner, Charles Olsen, the shaft struck stibnite ore at 49 feet and was in stibnite-bearing rock to abandonment of the shaft at 54 feet. A 97-foot shaft was sunk nearby. It reportedly encountered stibnite-bearing ore at 60 feet that continued on the hanging wall of a vein to the bottom of the shaft; the shaft was abandoned due to flooding. Material observed on the dump included finely crystalline stibnite with quartz and pyrite. The material reportedly assayed about 1 ounce of gold per ton, 2.05 dollars worth of silver, and some copper (Cathcart, 1922, p. 239-40). The veins reportedly had talc schist hanging walls about 10 feet thick.

Mertie (1918 [B 662-I, p. 431-432]) believed that the veins were in a fault zone. He noted that graphitic schist walls were cut by nearly vertical quartz veins with a strike of N 45 E. The veins probably are in the Anvil fault zone as shown by Hummel (1962 [MF 247]), who mapped a wide graphitic zone between two main faults along this part of Anvil Creek. Where the Anvil fault is exposed in the Snake River road cut (NM234), the graphitic schist is highly sheared and contorted in a zone 100 feet wide and locally con-

tains stibnite.

Alteration:

Age of mineralization:

Probably mid-Cretaceous or younger; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986, model 36a); simple Sb deposits (Cox and Singer, 1986; model 27d).

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

36a, 27d

Production Status: Undetermined.

Site Status: Inactive

Workings/exploration:

Five lode claims aligned about N 25 E were located and prospected by Charles Olsen before 1916 (Mertie, 1918 [B 662-I, p. 425-449]). A 97-foot shaft had a 35-foot drift. Workings in 1920 (Cathcart, 1922) included the 97-foot shaft and a 54-foot shaft.

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247).

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Widstedt No. 1**Site type:** Prospects**ARDF no.:** NM234**Latitude:** 64.5797**Quadrangle:** NM C-1**Longitude:** 165.3914**Location description and accuracy:**

The Widstedt No. 1 prospect is on the southeast side of Anvil Creek, approximately at the Snake River road crossing. The map location is in the west-central part of section 36, T. 10 S., R. 34 W., Kateel River Meridian. This is locality 48 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and locality 19 of Hummel (1962 [MF 247]).

Commodities:**Main:** Sb**Other:** Au**Ore minerals:** Arsenopyrite, jarosite, kermesite, pyrite, stibiconite, stibnite**Gangue minerals:** Quartz**Geologic description:**

The Widstedt No. 1 (Widstedt tunnel) prospect is in the Anvil Creek fault zone (Mertie, 1918 [B 662-I, p. 430]; Cathcart, 1922, p. 238-239; Hummel, 1962 [MF 247]). At the prospect, graphitic schist is contorted, broken, and commonly stained with jarosite, probably after very fine grained pyrite. Locally a bright yellow mineral and a red mineral are associated with veinlets of stibnite. The yellow and red minerals are herein inferred, respectively, to be stibiconite and kermesite, minerals formed by the oxidation of stibnite. A 70-foot crosscut was driven by J.C. Widstedt in 1899, and several tons of stibnite ore were produced from the workings. Coarsely crystalline stibnite occurred in kidneys enveloped in pyrite and arsenopyrite-bearing schist. Maximum gold assays reportedly exceeded 3 ounces per ton; silver and some copper were also reported. In general, however, the deposit appears to contain little gold.

Alteration:

Silicification and sulfidization of graphitic schist.

Age of mineralization:

Probably mid-Cretaceous or younger; see NM207.

Deposit model:

Simple Sb deposits (Cox and Singer, 1986; model 27d).

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

27d

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

The antimony-bearing shear zone was explored by workings as early as 1899; antimony prospecting continued through World War I.

Production notes:**Reserves:****Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Stipek And Kotovic (divide between Glacier and Rock Creeks)**Site type:** Prospect**ARDF no.:** NM235**Latitude:** 64.6029**Quadrangle:** NM C-1**Longitude:** 165.4125**Location description and accuracy:**

The approximate location of the Stipek and Kotovic prospect is between 150 and 350 feet elevation on the south flank of Mount Byrntson. The map location is at 300 feet elevation on the divide between Glacier and Rock Creeks, in the east-central part of section 23, T. 10 S., R. 34 W., Kateel River Meridian. It is locality 7 of Hummel (1962 [MF 247]), who erroneously called it the Hot Air prospect. It is included with other Rock Creek area prospects in locality 43 of Cobb (1972 [MF 463]; 1978 [OFR 78-93]) and is one of three prospects numbered 14 by Cathcart (1922, figure 18 and p. 241). The location is accurate to about 500 feet.

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Arsenopyrite, galena, gold, pyrite, scheelite**Gangue minerals:** Albite, quartz**Geologic description:**

Massive quartz veins and mineralized schist subcrop on the divide between Glacier Creek and Rock Creek. The general trend of the deposit is northeast, more or less parallel to the ridge. The prospect was developed around 1916 by Stipek and Kotovic (Mertie, 1918). Mertie (1918) reported the occurrence of scheelite at this location and thought the deposit was similar to that of Sophie Gulch (NM208). Cathcart (1922, figure 32, p. 241) found a quartz-feldspar vein containing pyrite and arsenopyrite exposed in a trench. The deposit was again prospected from 1985 to 1995 in the period of exploration initiated by geologist R.V. Bailey. The prospect is within the extensive gold-antimony soil geochemical anomaly identified by BHP in 1990 and by Kennecott Exploration Company in 1994 and 1995. This anomaly is essentially continuous on the lower slopes east of Snake River from Glacier Creek (NM220) to Lindblom Creek (NM205) and discontinuous to Goodluck Gulch (NM202). The prospect was trenched and drilled by Placer Dome in 1987 and 1988. Their exploration showed that this deposit is low grade and characterized by mas-

sive bull quartz veins, extensive albitization, and introduction of arsenopyrite. Some white vein quartz contains less than 1 percent galena. Exposures are poor; bedrock is mainly chloritic mica-quartz schist and some graphitic quartz schist, generally related to the chlorite-rich metaturbidite unit of Bundtzen and others (1994).

Alteration:

Albitization and sulfidization of schist.

Age of mineralization:

Probably mid-Cretaceous or younger; see NM207.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: Undetermined

Site Status: Probably inactive

Workings/exploration:

The area was prospected by Stipek and Kotovic before 1916 by shallow pits and shafts (Mertie, 1918 [B 662-I, p. 425-449]; Cathcart, 1922). Renewed exploration began in 1985; Placer Dome drilled several shallow holes in the area in 1987-88.

Production notes:

Some scheelite may have been produced in 1916.

Reserves:**Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Anvil Creek

Site type: Mine

ARDF no.: NM236

Latitude: 64.5637

Quadrangle: NM C-1

Longitude: 165.4154

Location description and accuracy:

This record describes the Anvil Creek system of placer gold deposits upstream of the Nome coastal plain. The map location is on the discovery claim, just west of the center of section 2, T. 11 S., R. 34 W., Kateel River Meridian. The site is approximately the same as locality 102 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other: Ag, Pb, W

Ore minerals: Galena, gold, magnetite, scheelite

Gangue minerals: Garnet

Geologic description:

Placer gold was discovered on lower Anvil Creek at an elevation of about 150 feet on September 22, 1898; by the end of 1898, the creek was staked between the coastal plain and Nekula Gulch (U.S. Mineral Survey plats, especially No. 722). The discoverers were the principals of the Pioneer Mining Company, Lindeberg, Lindblom, and Brynteson, and their associates. One claim, Nine Above, was initially proposed to be staked for Eskimos named Gabriel Adams and Constantine Uparazuck in recognition of their aid. The claim was otherwise staked and litigation over Nine Above lasted for decades.

The operators recovered about 100 ounces of gold soon after their discovery, but it was too late in the season for intensive mining (Collier and others, 1908, p. 17-18). Intensive mining began in 1899; nuggets weighing between 20 and 25 ounces were found, and in 1900 about 1,750,000 dollars (85,000 ounces) worth of placer gold was produced on Anvil Creek. Cumulative production from discovery until the end of 1900 was estimated at 3,000,000 dollars or about 145,000 ounces of fine gold (Schrader and Brooks, 1900, p. 17; Brooks and others, 1901, p. 69, 71-74). The valley bottom placer was nearly exhausted by the end of 1902 (Collier and others, 1908, p. 31). The width of pay ranged from about 50 feet in the lower canyon to as much as 500 feet above Specimen Gulch. In the canyon, the pay gravel was 3 to 5 feet thick under a thin cover of muck and clay. Most of the gold was on bedrock, but it occurred throughout the gravel and in the top 1 to

2 feet of bedrock. By 1902, bench deposits were being mined (Brooks, 1903), especially on the east side of Anvil Creek (Collier and others, 1908, see figure 11, p. 189). The first hydraulic lifts were installed in about 1903, and a steam shovel was in use by 1904 (Brooks, 1905). Engineer C.W. Purington presented data on mining costs and methods and reported that gold from the bench gravels was very slightly purer than gold from the creeks; most of the gold was very close to 900 fine (Purington, 1905). Dredging of previously mined ground was introduced by 1922 (Brooks and Capps, 1924) and lasted until about 1929 (Smith, 1932).

Two east-side benches were channels incised in bedrock. In places gold-bearing gravels spilled over the downhill bedrock rims of the channels, and bench placer pay mingled with the creek channel placers. In one cut, granitic boulders as well as a 40-pound galena nugget were found (Collier and others, 1908, p. 191).

Placer gold in Anvil Creek had multiple sources. Some could have been derived from mineralized bedrock exposed on Banner Peak, Bonanza Hill, and the saddle between Anvil Creek and Snow Gulch. Much of the gold, however, apparently came from high-level placers near Nekula Gulch at the head of Anvil Creek. Mining of rich bench deposits on the east side of upper Anvil Creek took place until World War II (Smith, 1941, 1942). Mining commenced again on a moderate scale after the increase of gold price in 1968, especially in the bowl between Nekula and Specimen Gulches. From 1993 until at least 1995, virgin bench deposits on the east side were mined by open-cut methods. These deposits and some of those in upper Anvil Creek could not be mined in earlier years because of conflicts with water supply, roads, and railroads.

The shallow placers exploited early in the history of Anvil Creek probably averaged about 0.25 ounce of gold per cubic yard; some contained as much as 2.5 ounces of gold per cubic yard. Production in the first five years was about 1,000,000 dollars per year, or a total of about 250,000 ounces. The largest nugget reported was a gold-quartz nugget containing about 129 ounces of gold (Moffit, 1913, p. 79-83). Total production to date is probably about 500,000 ounces.

The Anvil Creek fault zone transects the area more or less along Anvil Creek. This fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist that probably of early Paleozoic protolith age (Hummel, 1962 [MF-247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary; parts of Anvil Creek are at low enough elevations to have been influenced by Quaternary sea-level fluctuations.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; large

Site Status: Active

Workings/exploration:

Gold was discovered on Anvil Creek in September, 1898, and by the end of the year all of Anvil Creek between the coastal plain and Nekula Gulch was staked. From 1899 to 1902, rich and shallow alluvial deposits were mined, mostly by small-scale methods. Production from bench deposits began by 1903; they were mined partly by hydraulic elevators and partly by mechanical-hydraulic methods. Anvil Creek was dredged from about 1922 until 1932. In the 1930's, bench pay was mined, including the bench deposits near Specimen Gulch. In the 1990's, virgin ground was mined above Specimen Gulch and between Specimen Gulch and the coastal plain on the east side of Anvil Creek. These deposits could not be mined earlier because of land or water conflicts.

Production notes:

Anvil Creek is a major gold producer in the Nome mining district; the estimated total gold production is 500,000 ounces.

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Brooks and others, 1901; Brooks, 1903; Brooks, 1904; Brooks, 1905; Purington, 1905; Collier and others, 1908; Moffit, 1913; Brooks and Capps, 1924; Smith, 1932; Smith, 1941; Smith, 1942; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Bursik and Kern (King Mountain)**Site type:** Prospects**ARDF no.:** NM237**Latitude:** 64.5962**Quadrangle:** NM C-1**Longitude:** 165.3469**Location description and accuracy:**

Prospects developed by Bursik and Kern (Mertie, 1918, p. 429) are on the south and southwestern slopes of King Mountain in upper Anvil Creek and extending southeastward toward Dexter. The map location is at an elevation of 750 feet in the north-central part of section 30, T. 10 S., R. 33 W., Kateel River Meridian. The site corresponds to locality 45 of Cobb (1972 [MF 463], 1978 [OFR 78-93]), and locality 6 of Cathcart (1922, p. 238 and figure 18).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, limonite**Gangue minerals:** Quartz**Geologic description:**

Eight claims owned by Bursik and Kern were located on the west and southwest flank of King Mountain (Mertie, 1918 [B 662-I, p. 429]; Cathcart, 1922, locality 6, figure 18). On the claims, bleached (?) marble probably contains lenses of white quartz, and iron-stained quartz and schist were reported in shallow shafts. The owners of the property reported that more than 100 assays from an 85-foot shaft ranged from 2.50 to 3.75 dollars per ton (about 0.125 to 0.175 ounce of gold per ton). Cathcart (1922, p. 238) found only a little mineralized schist and marble in a cut; no assays were made. The Anvil Creek fault transects the area nearby. This fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock at the prospect is mostly graphitic schist probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Bleaching of marble and oxidation.

Age of mineralization:**Deposit model:**

Low-sulfide Au-quartz veins? (Cox and Singer, 1986; model 36a).

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

36a?

Production Status: No

Site Status: Inactive

Workings/exploration:

One 85-foot shaft (at an elevation of 700 feet), a 20-foot adit (at an elevation of 900 feet), and shallow shafts or pits were dug by Bursik and Kern before 1916 (Mertie, 1918 [B 662-I, p. 429]). More recent work has probably not been done in this area.

Production notes:**Reserves:****Additional comments:****References:**

Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Mertie, 1918

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Caribou Bill**Site type:** Mine**ARDF no.:** NM238**Latitude:** 64.5897**Quadrangle:** NM C-1**Longitude:** 165.3570**Location description and accuracy:**

The Caribou Bill placer mine is at an elevation of about 500 feet in Nekula Gulch, about 4,400 feet southwest of the summit of King Mountain. Nekula Gulch is in the south-side headwaters of Anvil Creek (NM236). The map location is in the SW1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 117 (Dexter Hill) of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Caribou Bill mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to 150 feet thick and commonly were very rich (Brooks and others, 1901). The richest pay was near bedrock and in decomposed or fractured bedrock. The Caribou Bill mine also had very rich pay in what is probably a karst-related solution pit or cavern 90 feet deep in marble; the slightly rounded schist and marble pebble gravels (cemented with yellow clay) contained as much as 48 ounces of coarse and angular gold per cubic yard (Collier and others, 1908). The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. The high-level gravels were originally interpreted to be alluvial deposits in stream channels of former drainage systems, but more recent interpretations describe them as glacial outwash-related material (Cobb, 1973 [B 1374]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but such clasts are mostly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus seems in question still. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

The Anvil fault transects the area near Nekula Gulch. The Anvil fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF-247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

The Caribou Bill deposit was mined in a surface pit that was 30 by 50 feet across and 20 feet deep in 1902-03; a 90-foot shaft was used to recover rich pay from what is probably a solution cavity in marble (Collier and others, 1908). Possibly the deposit was a gigantic pothole.

Production notes:

The Caribou Bill deposit was very rich consisting of gravels containing as much as 48 ounces of gold per cubic yard. The gold was coarse and angular and thought to be locally derived. Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908).

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Madeline; Mattie (upper workings)

Site type: Mine

ARDF no.: NM239

Latitude: 64.5904

Quadrangle: NM C-1

Longitude: 165.3518

Location description and accuracy:

The Madeline placer mine is at an elevation of about 600 feet in the headwaters of Anvil Creek (NM236) and about 3,400 feet southwest of the summit of King Mountain. It is on the northeast side of the divide between upper Anvil Creek (NM236) and Deer Gulch on Dexter Creek (NM303). The map location is in the SW1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 117 (Dexter Hill) of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

The Madeline mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to 150 feet thick and commonly were very rich (Brooks and others, 1901). The richest pay was near bedrock and in decomposed or fractured bedrock. The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. At the Madeline mine, the section exposed in a shaft included 1 foot of turf and 60 feet of sand and gravel overlying 4 to 9 feet of pay gravel; the pay streak was in a bedrock channel 15 to 150 feet wide that was followed for one-half mile (Collier and others, 1908). The high-level gravels were originally interpreted as alluvial deposits in stream channels of former drainage systems, but more recent interpretations describe them as glacial outwash-related material (Cobb, 197 [B 1374]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but the exotic clasts are mostly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus still seems in question. The richness of some of the placers suggests extensive

reworking, proximity to lode sources, or both.

The Anvil fault transects the area near Nekula Gulch. The Anvil fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

The Madeline mine is a drift mine off a shaft about 65 feet deep. At least a half mile of drifting took place.

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908).

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Mattie (lower workings)

Site type: Mine

ARDF no.: NM240

Latitude: 64.5892

Quadrangle: NM C-1

Longitude: 165.3526

Location description and accuracy:

The Mattie placer mine is at an elevation of about 575 feet on the north side of the divide between Nekula Gulch in the south headwaters of Anvil Creek (NM236) and Deer Gulch in the north headwaters of Dexter Creek (NM303). The map location is in the SW1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. It was included in locality 117 (Dexter Hill) of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

The Mattie mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to 150 feet thick and locally were very rich (Brooks and others, 1901). The richest pay was near bedrock and in decomposed or fractured bedrock. The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. An hydraulic cut at the Mattie mine exposed 5 to 6 feet of sandy wash and pebbles overlying 25 feet of stratified gravel and clayey sediment. The bright and not-waterworn gold was concentrated on bedrock and in the top several feet of creviced bedrock; about 0.45 ounce of gold per cubic yard was recovered in 1900 (Collier and others, 1908). The high-level gravels were originally interpreted as alluvial deposits in stream channels of former drainage systems but more recent interpretations describe them as glacial outwash-related material (Cobb, 1973 [B 1374]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin but the exotic clasts are commonly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus still seems in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources,

or both.

The Anvil fault transects the area near Nekula Gulch. The Anvil fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hopkins, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Surface workings at the Mattie mine included a 50- by 150-foot hydraulic cut that was excavated to a depth of 30 feet. About 0.45 ounce of gold per cubic yard was recovered in 1900 (Collier and others, 1908).

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908).

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Snowflake**Site type:** Mine**ARDF no.:** NM241**Latitude:** 64.5865**Quadrangle:** NM C-1**Longitude:** 165.3474**Location description and accuracy:**

The Snowflake placer mine is at Dexter, in the north headwaters of Dexter Creek (NM303). It is at an elevation of about 600 feet on the south side of the divide between Nekula Gulch and Deer Gulch. The map location is just inside the south-central border of section 30, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 117 (Dexter Hill) of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Snowflake mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to 150 feet thick and commonly were very rich (Brooks and others, 1901). The richest pay was near bedrock and in decomposed or fractured bedrock. The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. The section exposed in the main shaft of the Snowflake mine included 5 feet of muck and gravel containing granite and gneiss boulders above 125 feet of silt and gravel on bedrock; the lower 3 to 9 feet of gravel was auriferous. West of the shaft, the pay streak was 100 feet wide on bedrock but to the east this paystreak was on older gravels. A winze sunk 70 feet east of the main shaft reached bedrock 100 feet deeper, where another pay streak was developed on bedrock (Collier and others, 1908). The pay at the Snowflake mine ran about 0.3 ounce of gold per cubic yard; the gold was bright and subangular to crystalline (small octahedrons were visible), and some nuggets included fragments of quartz and calcite. The largest nugget recovered by 1903 weighed more than 9 ounces (Collier and others, 1908). The high-level gravels were originally interpreted to be alluvial deposits in stream channels of former drainage systems, but more recent inter-

pretations describe them as glacial outwash-related material (Cobb, 1973 [B 1374]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but the exotic clasts are commonly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus still seems in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

The Anvil fault transects the area near Nekula Gulch. The Anvil fault is a through-going, high-angle structure that juxtaposes different types of graphitic schist in this area (Hummel, 1962 [MF 247]). Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962, [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Workings at the Snowflake mine were underground. They included a 130-foot-deep main shaft, a winze sunk 70 feet east of the main shaft to the 230-foot level, and drifts trending N 60 W and S 60 E from the main shaft (Collier and others, 1908; Moffit, 1913).

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908). The pay ran about 0.3 ounce of gold per cubic yard at the Snowflake mine (Collier and others, 1908).

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Sugar

Site type: Mine

ARDF no.: NM242

Latitude: 64.5855

Quadrangle: NM C-1

Longitude: 165.3431

Location description and accuracy:

The Sugar placer mine is at an elevation of about 600 feet in the east headwaters of Deer Gulch and 4,000 feet south-southwest of the summit of King Mountain. The map location is just inside the north boundary of section 31, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 117 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

The Sugar mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to more than 200 feet thick and commonly were very rich (Brooks and others, 1901; Collier and others, 1908). The richest pay was near bedrock and in decomposed or fractured bedrock. The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. At the Sugar mine, as at the nearby Snowflake mine (NM241), the pay streaks were staked. There was a 10-foot-thick pay section on an older gravel surface at a depth of about 100 feet. Drilling through the older gravel reached bedrock at 205 feet, where gold was present on the bedrock surface (Collier and others, 1908). A 100-foot-deep shaft 300 feet southeast of the Sugar mine, penetrated 4 feet of muck and silt, 25 feet of loose blue gravel containing gold colors, 51 feet of decomposed schist, 10 feet of washed gravel and schist, and 20 feet of schist; several exploration workings were driven off this shaft. About 100 feet southwest of this shaft, a 40-foot-deep prospect pit encountered 20 feet of brown gravel, 4 feet of blue clay and gravel, and 16 feet of yellow sandy clay and gravel. The high-level gravels were originally interpreted to be alluvial deposits in stream channels of former drainage systems, but more recent interpretations describe them as glacial outwash-related material (Cobb, 1973 [B

1374]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but the exotic clasts are commonly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus still seems in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

Bedrock is mostly marble, in contact with graphitic schist nearby to the north, probably of early Paleozoic protolith age (Hummel, 1962 MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Nelson and Hopkins, 1972; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

The workings at the Sugar mine were underground and included a shaft about 100 feet deep.

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908).

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Gold Hill (drift mine near Dexter)**Site type:** Mine**ARDF no.:** NM243**Latitude:** 64.5846**Quadrangle:** NM C-1**Longitude:** 165.3409**Location description and accuracy:**

The Gold Hill drift placer mine is in the headwater divide between Deer and Grouse Gulch, small north tributaries to Dexter Creek (NM303). The map location is the location of the Gold Hill shaft at an elevation of about 575 feet in the NE1/4 section 31, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 117 of Cobb (1972 [MF 463]; 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Gold Hill mine is one of several near the divide between upper Anvil Creek (NM236) and Dexter Creek (NM303) at surface elevations of about 450 to 600 feet, where high-level gravels were placer mined for gold. These deposits were in gravels that ranged from a few feet to more than 200 feet thick and commonly were very rich (Brooks and others, 1901; Collier and others, 1908). The richest pay was near bedrock and in decomposed or fractured bedrock. The high-level gravels were mined mostly by drifting, but some hydraulic mining also took place. Specific information about the Gold Hill deposit is not available. The high-level gravels were originally interpreted to be alluvial deposits in stream channels of former drainage systems, but more recent interpretations described them as glacial outwash-related material (Cobb, 1973 [B 1374] Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but the exotic clasts are commonly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of the high-level gravels thus still seems in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

Bedrock is mostly marble, in contact with graphitic schist to the north. these rocks are probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel,

and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Underground workings, probably now caved or flooded, were accessed by a shaft.

Production notes:

Specific information about the Gold Hill deposit or its production is not available. Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908).

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: This report

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Hines and McLaughlin; Royal Group**Site type:** Prospect**ARDF no.:** NM244**Latitude:** 64.5883**Quadrangle:** NM C-1**Longitude:** 165.3409**Location description and accuracy:**

The Hines and McLaughlin (Royal Group) claims are at an elevation of about 700 feet on the southwest flank of King Mountain. The location is approximately locality 5 of Cathcart (1922, p. 235, figure 18). The map location is in the SE1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. The location is approximate, but probably accurate to within a quarter of a mile.

Commodities:**Main:** Au**Other:** Pt (?)**Ore minerals:** Gold, jarosite, pyrite (?)**Gangue minerals:** Quartz**Geologic description:**

The Hines and McLaughlin prospect was developed by six shafts ranging from 20 to 56 feet in depth (Cathcart, 1922, p. 236). The shafts were sunk in bedrock composed of alternating layers of marble and mineralized schist. None of the workings were open when Cathcart visited the area. He reported that the schist was mostly decomposed and stained yellow--possibly by jarosite that replaced pyrite. Little quartz was present. The material did not pan free gold, but the owners reported assays of 3 to 24 dollars in gold; they also reported the presence of platinum, which Cathcart doubted.

Alteration:

Sulfidization of schist.

Age of mineralization:

Probably about mid-Cretaceous, the age of other lode gold deposits in the Nome district.

Deposit model:

Low-sulfide replacement lode in schist and marble.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Five claims on King Mountain above Dexter were explored by shallow shafts that were caved at the time of Cathcart's visit (Cathcart, 1922). The claims, including the Royal Group on King Mountain, were reported by Mertie (1918), but he did not visit them in 1916. Gold was reported by assay, but decomposed schist did not pan free gold. The validity of the prospect is doubtful.

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1918 (B 662-D); Cathcart, 1922.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (lode in Dexter Creek)**Site type:** Prospect**ARDF no.:** NM245**Latitude:** 64.5799**Quadrangle:** NM C-1**Longitude:** 165.3324**Location description and accuracy:**

This lode prospect is at an elevation of about 300 feet on the north side of Dexter Creek (NM303) about 300 feet upstream of the mouth of Grouse Gulch and about 5,700 feet south of the summit of King Mountain. It is at the east-central edge of section 31, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 49 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is uncertain, but it probably is within 1,000 feet.

Commodities:**Main:** Au, Cu**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

A 400-foot tunnel driven in or before 1907 was reported by Smith (1908, p. 240). The ore reportedly contained about 4 percent copper. Moffit (1913, p. 135) proposed that gold in the deposit was more valuable than the copper. Country rock is probably the marble-rich unit mapped by Hummel (1962 [MF 247]).

Alteration:**Age of mineralization:****Deposit model:**

Copper- and gold-bearing lode deposit; Low-sulfide Au-quartz vein? (Cox and Singer, 1986; model 36a).

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

36a?

Production Status: No

Site Status: Inactive

Workings/exploration:

A 400-foot adit was driven into the north bank of Dexter Creek in or before 1907 (Smith, 1908); no subsequent work has been reported.

Production notes:

Reserves:

Additional comments:

References:

Smith, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Smith, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Dexter High Bench**Site type:** Mine**ARDF no.:** NM246**Latitude:** 64.5866**Quadrangle:** NM C-1**Longitude:** 165.3527**Location description and accuracy:**

This record describes a complex, high-level gold placer deposit centered on the divide at the head of Deer Gulch. Other shaft mines in the Dexter divide area are described in records NM238-243. The map location is at an elevation of about 550 feet in the SW1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. This location is included in locality 117 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Dexter High Bench placer deposit is one of three similar deposits. The others are the Summit deposit (NM247) and the deposit at the head of Dry Creek (NM248). The Dexter high-level deposit includes the relatively low-grade auriferous gravel that mantles the divide between Nekula and Deer Gulches and extends southward onto the flanks of Dexter Peak and northward to Kings Mountain. It also includes two buried paystreaks. The northern paystreak extends southeasterly, approximately from the Madeline mine (NM239) to the Gold Hill drift mine (NM243). The southern paystreak extends southeasterly from Nekula Gulch (lower Mattie, NM240) to upper Deer Gulch. The paystreaks were exceptionally rich, and Collier and others (1908, p. 199) proposed that if water could be gotten to the high-level gravels outside the paystreaks then, 'all these deposits of gravel could be sluiced at a profit.' The lower Mattie in Nekula Gulch was the first discovery; it produced 90,000 dollars in gold in 1900, its first season (Collier and others, 1908, p. 201). The lower Mattie, and probably the Caribou Bill (NM238), developed the northwest end of the southern paystreak. According to Moffit (1913, p. 102-103), the southern paystreak was almost exposed in Nekula Gulch but was buried to a depth of 135 feet at Dexter Station. It was mined nearly continuously from Nekula Gulch to Deer Gulch. The northern paystreak was worked in the upper Mattie (NM239), Snowflake (NM241), Sugar

(NM242), and Gold Hill (NM243) drift mines.

The presence in the Nome district of elevated benches that could contain gold was first pointed out by Schrader and Brooks (1900, p. 12, 16, and 20). The discovery of gold in the high-level gravel at Nekula Gulch followed this report. Some of the gold recovered in the Dexter deposits was crystalline; the gold also had quartz and calcite attached and was regarded as of local origin. One gold nugget having crystalline faces weighed more than 9 ounces (Collier and others, 1908, p. 204; Moffit, 1913, p. 105).

The origin of the high-level gravel deposits has been interpreted in various ways. Collier and others (1908, p. 198) regarded them as elevated remnants of deposits of an older drainage system ' . . . which have been dissected and for the most part removed.' In recent years, the deposits have been interpreted as glacier-margin channels and spillways (Hopkins and others, 1960; David M. Hopkins, cited by Cobb, 1973 [B 1374], p. 83; Nelson and Hopkins, 1972). Granite boulders possibly of glacial origin, are in the deposits, but at Dexter the boulders are at the surface, not in the pay gravels (Moffit , 1913, p. 104). Collier and others (1908, p. 199) proposed that at least some of the boulders were ice-rafted during a period of submergence. The age and origin of the high-level gravels thus still seem in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

Bedrock underlying the Dexter high-level gravels possibly includes some marble and graphitic schist (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]), rocks apparently younger than the 'mixed unit' of Till and Dumoulin (1994). Most of the saddle area, however, is underlain by feldspathic orthogneiss and metavolcanic schist (Bundtzen and others, 1994). The Dexter area was proposed as a center of silicic volcanism similar to that at Aurora Creek (NM140). The metavolcanic rocks could be the source of some of the gold in the placer deposits.

Alteration:

Age of mineralization:

Quaternary, but possibly late Tertiary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes

Site Status: Probably inactive

Workings/exploration:

Gold was discovered in Nekula Gulch in 1900. About 90,000 dollars worth of gold (about 4,500 ounces) was mined in 1900. The area was developed rapidly; it was active when visited by Collier and others (1908) in 1903 and by Moffit (1913) in 1905 and 1906. The Caribou Bill probably was the richest deposit ever found in the district; some pans

there contained about an ounce of gold. Material excavated from that rather small deposit (30 x 50 feet x 90 feet deep) contained about 50 ounces of gold per cubic yard. Two main, largely buried paystreaks were mined. Material hoisted from most mines contained more than 0.25 ounce of gold per cubic yard.

Erosion and reworking of the high gravel deposits appears to have been a main source of gold in upper Anvil and Dexter Creeks.

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908). The high level gravels at Dexter were mostly worked out by 1906.

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hopkins and others, 1960; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Summit High Bench**Site type:** Mine**ARDF no.:** NM247**Latitude:** 64.5785**Quadrangle:** NM C-1**Longitude:** 165.3596**Location description and accuracy:**

The Summit high-level placer gold deposit is at an elevation of about 530 feet on the low divide between upper Specimen Gulch (NM312) and Grass Gulch. It is 5,500 feet north-northeast of the summit of Anvil Mountain in the west-central part of section 31, T. 10 S., R. 33 W., Kateel River Meridian. Summit was a former station on the abandoned Seward Peninsula railway. The locality is included in number 18 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The Summit high-level bench placer mine worked a gravel deposit 600 to 800 feet wide at the surface. The paystreak was in a 50 to 80-foot-wide bedrock channel incised in schist. The mine was developed by shafts and drifts. On the Summit claim (at about 525 feet surface elevation), the gravel was 106 feet thick, and the elevation of the underlying surface of the schist was about 420 feet (Collier and others, 1908, p. 206). At the bottom of the Summit shaft, the local paystreak trended N 82 W. The pay gravel was about 6 to 7 feet thick and was composed of waterworn boulders and cobbles of schist, limestone (marble), and granite. In contrast to the deposit on Dexter divide (NM246), gold nuggets were well rounded and appeared to have been transported for some distance. The paystreak averaged about 7 to 8 dollars per yard (gold at 20.67 dollars per ounce), but some ground was appreciably richer yielding pans worth as much as 150 dollars. One nugget weighed about 7 ounces. Collier and his associates thought that gneiss and granite boulders 'must have come from a great distance and seem to indicate that the stream which deposited them was a long one' (Collier and others, 1908, p. 206).

The high-level gravels were originally interpreted to be alluvial deposits in stream channels of former drainage systems, but David Hopkins has proposed that they are ice-

marginal systems (Hopkins and others, 1960; cited in Cobb, 1973 [B 1374, p. 83]; Nelson and Hopkins, 1972). Unlike the Dexter area, where exotic boulders appear to be mostly been in the shallow gravels, at Summit, granite, gneiss, schist, and marble occur throughout the pay gravel. The age and origin of the high-level gravels thus still seem in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

Bedrock is mostly graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994). Bundtzen and others (1994) map the bedrock at Summit as a porphyroclastic, micaceous graphitic schist.

Alteration:

Age of mineralization:

Quaternary; possibly as old as late Tertiary.

Deposit model:

Alluvial placer Au; buried high-level alluvial channel (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; small

Site Status: Probably inactive

Workings/exploration:

The workings at the Summit mine were underground. They included several shafts as deep as 106 feet and more than 600 to 700 feet of drifts; 300 feet of the pay streak was worked out by 1903 (Collier and others, 1908).

Production notes:

Production from the high-level gravels of the general area totaled about 100,000 ounces by 1903 (Collier and others, 1908). About 5000 ounces of gold were probably produced from the high level deposits on the Summit and nearby claims.

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Hopkins and others, 1960; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed high-bench deposit (Dexter Creek-Dry Creek divide)

Site type: Mine

ARDF no.: NM248

Latitude: 64.5675

Quadrangle: NM C-1

Longitude: 165.3429

Location description and accuracy:

This record describes high-level, auriferous gravel deposits on the divide between Dry Creek (NM249) and Wet Gulch, a north-flowing headwater tributary to Dexter Creek (NM303). It is at a surface elevation of about 575 feet and 4,500 feet northeast of the summit of Anvil Mountain in the NE1/4 section 6, T. 11 S., R. 33 W., Kateel River Meridian. It is approximately the same location as locality 125 of Cobb (1972 [MF 463]). The location is accurate to within about 500 feet.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Auriferous high-level gravels on the Dry Creek-Dexter Creek divide are one of three closely related ancient placer deposits; the other two are at Summit (NM247) and Dexter Station (NM246). The main deposit on the Dry Creek-Dexter Creek divide appears to have been within a nearly north-south, gently incised channel in schist bedrock. It was developed by a series of shafts for a distance of about 2,000 feet. Pay extended up the flanks of the channel, where it was successfully mined (Collier and others, 1908, p. 208-209), although the flank deposits were not as rich as the deposits near the base of the channel. Near the divide, the gravel section was approximately 72 feet thick, consisting, from the top down, of 16 feet of muck and slide rock, 12 feet of somewhat auriferous washed gravel, 2 feet of sandy soil, 22 feet of soil, peat, and slide rock, and a pay section of 10 feet of stream gravel on decomposed schist bedrock (Collier and others, 1908, p. 208). Most of the pay was within 2 to 3.5 feet of bedrock and consisted mostly of sand containing well-rounded pebbles of schist, vein quartz, and marble. Gold was fairly coarse and well rounded. Much of the gravel was thawed and could be worked yearround from shallow timbered shafts. The paystreak contained from about 6 to 12 dollars in gold

per cubic yard (gold at 20.67 dollars per ounce). Toward Dry Creek, the paystreak had poorly defined rims, and bedrock generally had a gentle slope to the north.

These ancient gold deposits may be in stream channels of former drainage systems (Collier and others, 1908) or in ice-marginal drainages (Hopkins and others, 1960; Cobb, 1973 [B 1374, p. 83]; Nelson and Hopkins, 1972). The presence of erratic granite boulders and other exotic rock types suggests a glacial origin, but the exotic clasts are commonly in near-surface materials and not distributed throughout the high-level gravels (Moffit, 1913). The origin of these gravels thus still seems in question. The richness of some of the placers suggests extensive reworking, proximity to lode sources, or both.

Bedrock is mostly schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). Bedrock under the divide belongs to the porphyroclastic micaceous graphitic schist unit of Bundtzen and others (1994). Upper Dry Creek is underlain by felsic schist, possibly in fault contact with the porphyroclastic unit.

Alteration:**Age of mineralization:**

Quaternary or possibly late Tertiary.

Deposit model:

Alluvial placer Au; buried high-level placer deposits (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes

Site Status: Inactive

Workings/exploration:

Most of the area was mined by drifting from shafts between 1902 and 1906. Deposits in upper Dry Creek were worked from the surface or from shallow shafts.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Hopkins and others, 1960; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1973 (B 1374); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Upper Dry Creek; Bear Creek (Gulch)**Site type:** Mine**ARDF no.:** NM249**Latitude:** 64.5516**Quadrangle:** NM C-1**Longitude:** 165.3446**Location description and accuracy:**

This record describes gold placer deposits in Dry Creek upstream from the Nome coastal plain to the divide at the head of the creek. The map location is at an elevation of about 275 feet, just north of the center of section 7, T. 11 S., R. 33 W., Kateel River Meridian. It coincides approximately with locality 126 of Cobb (1972 [MF 463]).

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, ilmenite, limonite, magnetite, scheelite**Gangue minerals:** Garnet, quartz**Geologic description:**

Dry Creek heads in high-level, gold-bearing gravels at the saddle between upper Dry Creek and Wet Gulch (NM248). Gold in uppermost Dry Creek was mined from 2-foot-thick gravels on a thin clay layer resting directly on schist bedrock. Mining began as early as 1900 when 1,200 ounces of gold were produced (Brooks and others, 1901). Significant early production also came from an east-side bench, 50 feet above the creek, where a 0.5- to 4-foot-thick pay streak was 20 to 60 feet wide; this pay was very rich. It commonly ran about 0.5 ounce of gold per cubic yard but in places exceeded 2.5 ounces of gold per cubic yard (Collier and others, 1908). Pay gravel was locally cemented by iron oxide (limonite) and buried by 20 to 50 feet of gravel, slide rock, fine sand, muck, and silt. The heavy-mineral concentrate contained garnet, ilmenite, magnetite, and scheelite. Gold was also mined from Bear Creek (or Gulch), a tributary to upper Dry Creek on the Anvil Mountain side.

Placer gold was mined extensively from Hotel Gulch downstream to an elevation of about 180 feet where Dry Creek enters the Nome coastal plain, just above the trace of Third Beach (NM258). The deposit was mined as recently as 1996. Extensive tailings suggest also that an ancestral Dry Creek probably flowed southwesterly at the point that the creek leaves the mountain front.

Bedrock along Dry Creek is mainly platy to massive marble with some felsic schist oc-

curs near Bear Creek (Hummel, 1962 [MF 247]; Bundtzen and others, 1994).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

Most of the workings on upper Dry Creek are surface cuts. Tailings on Dry Creek where it enters onto the Nome coastal plain suggest that considerable dredging may have taken place there between 1920 and 1938. The east-side bench may have been at least partly mined by underground workings.

Production notes:

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nome Mining District**Site type:** Mines**ARDF no.:** NM250**Latitude:** 64.5776**Quadrangle:** NM C-1**Longitude:** 165.3944**Location description and accuracy:**

This record is a summary description of the lode and placer deposits of the Nome mining district. The district has been variously defined. For the purposes of this summary, it comprises all of the Nome B-1 and C-1 quadrangles and parts of the Nome C-2, D-1, and D-2 quadrangles (Bundtzen and others, 1994). The region encompassed by these quadrangles includes all the important placer gold deposits in what historically has been called the Nome mining district; it also includes the most important lodes that gave rise to the placer deposits and essentially all the production assigned to the Nome mining district by Bundtzen and others (1994) and Koschmann and Bergendahl (1968). The map location is approximately at the head of the richest alluvial placers and at the south end of the main lode belt that fed the placer deposits. It is in the NW1/4SW1/4 section 36, T. 10 S., R. 33 W., Kateel River Meridian. The district includes the Nome placer field (NM251), an area of composite alluvial and beach placers (NM252), and the main beach and marine abrasion placers (NM253). Specific placer deposits throughout this region are described separately.

Commodities:**Main:** Au**Other:** Ag, Pb, Sb, Sn, W**Ore minerals:** Arsenopyrite, cassiterite, galena, gold, pyrite, scheelite, stibnite**Gangue minerals:** Albite, ankerite, calcite, quartz**Geologic description:**

The country rocks in the Nome mining district as defined by Bundtzen and others (1994) consist of three main lithostratigraphic units: an upper unit of chlorite- and albite-rich mafic schist, local marble, and calc-schist; a middle unit of massive and platy marble, graphitic mica and quartz schist, felsic schist, and chlorite-rich metaturbidite schist; and a lower unit of garnet and graphitic schist, albite-chlorite schist, quartz schist, paragneiss, and iron-rich biotite schist. These three units are correlated, from the top down, with the Casadepaga Schist of Smith (1910) and Moffit (1913), the 'mixed unit' of Till and others (1986), and the Solomon Schist of Smith (1910) and Moffitt (1913). The relations of the

three units are complex; locally they appear to be in thrust contact with each other; elsewhere, apparently different units may be metamorphic equivalents. In general, however, they form a mappable, apparently stratigraphic, sequence of rocks. For the purpose of describing the dominant type of lode deposit, the apparent stratigraphic sequence can be used. The principal lode gold deposits have a ductile-brittle structural history. The oldest lodes are rich in arsenopyrite and albite; they occur in ductilely deformed, concordant and fold-controlled deposits. These deposits appear to grade into the sheeted-vein deposits that sharply cut metamorphic rocks and that contain most of the lode gold in the district.

Structurally, the district is divided into two provinces. The southern and most important province has an antiformal structure modified by relatively late faults that strike north-northeast to northeast. From east to west, the main northeast faults are the composite Anvil Creek fault, the Rodine fault, the Penny River fault, and the Aurora Creek fault (Bundtzen and others, 1994). The core of the antiformal structure lies west of Snake River; it trends generally north. As mapped in a more detailed industry study (1:12,000 to 1:24,000 scale), the antiformal axis is displaced by the Rodine and other faults. The apparently oldest rocks are exposed at lower elevations in Boulder Creek, along lower Twin Mountain Creek, and in Bangor Creek. Bundtzen and others (1994) mapped a slightly foliated metadiorite or metagabbro in or near the core of the antiform in Bangor Creek. The northern province includes the Mount Distin area and the area north of Stewart River. There the major structures are aligned more nearly east-west, subparallel to the uplift axis of the arch of the Kigluaik Mountains to the north (see Hummel, 1962 [MF 247]).

The main belt of lode deposits extends north-northwest for about 5 miles from Bonanza Hill through Glacier and Rock Creeks to the Goodluck Gulch deposit (NM202). Within the belt, most of the mineralized structures strike northeast.

Placer deposits formed in a complex fluvial and coastal marine environment. High-level placers, such as the High Bench at the Dexter divide (NM246), formed early in the erosional history of the district, perhaps in an early Nome glacial event (Hopkins and others, 1960; Nelson and Hopkins, 1972). Somewhat later, erosion of lodes and older placers formed alluvial deposits, as at Anvil Creek (NM236), in or near the modern drainages. Complex deposits formed where ancient auriferous drainages flowed into ancestral Norton Sound. Beach strand-line and related offshore deposits formed by abrasion and reworking of deposits in the strand and offshore marine environment (Metcalf and Tuck, 1942). The richest placer gold deposits, including those on the coastal plain, have been reworked extensively, are proximal to their bedrock sources, or both. The development of all placer gold deposits in the region that are at elevations of 250 feet or less was probably influenced by fluctuations in sea level in the late Pliocene and in the Pleistocene.

Alteration:

Extensive alteration, mainly albitization and sulfidization, accompanied early ductile lode mineralization. Arsenopyrite was the main introduced sulfarsenide. Later alteration during the brittle stage includes sericitization, silicification, and ankeritization.

Age of mineralization:

The lode gold deposits are mid-Cretaceous, and the placer gold deposits are Quaternary. The lode gold deposits at Bluff have been determined to be 109 Ma (Ford and Snee, 1996); more widespread radiometric dating of lode gold deposits is needed.

Deposit model:

The principal deposit types in the region are: low-sulfide Au-quartz veins, simple Sb deposits, Kuroko massive sulfide, and alluvial placer Au (Cox and Singer, 1986; models 36a, 27d, 28a, and 39a).

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

36a, 27d, 28a, 39a

Production Status: Yes**Site Status:** Active**Workings/exploration:**

Major alluvial placer gold deposits in the Nome mining district were discovered in September and October of 1898 by John Brynteson, Jafet Lindeberg, and Erik O. Lindblom. The men were supported by an active Scandinavian community based at Golovin, who mainly came to the region for the Swedish Covenant Church, and by several Eskimos, including Gabriel Adams and Constantine Uparazuck. A mining district was formed in October, 1898, by Brynteson, Lindeberg, Lindblom, A.N. Kittlesen, Johan Tornensis, a Saami, and Gabe Price, who represented Charles D. Lane, an experienced mining man. Many of the best alluvial placers were located in 1898. In 1899, gold was discovered on Present Beach (NM255) at Nome. A.H. Brooks of the U.S. Geological Survey then predicted that buried beach placer deposits would be found, a prediction that proved accurate when Second Beach (NM256) was discovered in 1902. The Third beach (NM258) was discovered in 1904. The placers were first exploited mainly by hydraulic methods, and major ditches were constructed to support these operations. Some shallow thawed deposits were mined successfully by small dredges. In the 1920's, after invention of the cold-water thawing process, large dredges were brought into the country by Wendell P. Hammon, whose interests were later consolidated by the U.S. Smelting, Refining, and Mining Company. The more important references for the early history of the Nome mining district are Brooks and others, (1901), Collier and others (1908), Moffit (1913), Metcalfe and Tuck (1942), and Spence (1996).

Lode exploration began shortly after discovery of the placers, but that was not significant until the 1980's when geologist R.V. Bailey reopened old workings in Rock Creek (NM207) and discovered sheeted veins in upper Snow Gulch (NM223). His work was followed up by Placer Dome, Newmont Mining Company, and Kennecott Exploration Company. In 1999, the assets of the successors to the U.S. Smelting, Refining, and Mining Company were acquired by Novagold Resources. This company is proceeding with hardrock exploration and has plans to continue placer mining.

Production notes:

The Nome mining district is the second most important placer district in Alaska. From 1898 to 1993, more than 4,800,000 ounces of gold (150 metric tonnes) were produced, essentially all by placer methods and mostly from complex alluvial deposits or buried beach deposits (Bundtzen and others, 1994, table 4; Metcalfe and Tuck, 1942). This pro-

duction estimate exceeds the nearly 3,600,000 ounces reported by Koschmann and Bergendahl (1968) for the district through 1959 that excludes years 1931 to 1946; the 1930s were important producing years. The district is also estimated to have produced more than 550,000 ounces (17.54 metric tonnes) of silver (Bundtzen and others, 1994, table 4). Very small amounts of stibnite and scheelite were also produced.

Reserves:

Drill-indicated gold resources, which approximate reserves when gold is about 350 to 400 dollars per ounce in 2000 dollars, are on the order of 2,500,000 ounces including 1 million ounces offshore, 1 million ounces in placers onshore, and more than 500,000 ounces in lodes on shore, mainly at Rock Creek. The onshore placer resources are in several deposits including some amenable to open-pit mining and others that could be dredged if thawing is economic.

Additional comments:**References:**

Brooks and others, 1901; Collier and others, 1908; Smith, 1910; Moffit, 1913; Metcalfe and Tuck, 1942; Hopkins and others, 1960; Hummel, 1962 (MF 247); Koschmann and Bergendahl, 1968; Nelson and Hopkins, 1972; Till and others, 1986; Bundtzen and others, 1994; Spence, 1996; Ford and Snee, 1996.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Little Creek composite placer; Nome placer field**Site type:** Mines**ARDF no.:** NM251**Latitude:** 64.5439**Quadrangle:** NM C-1**Longitude:** 165.4026**Location description and accuracy:**

The Little Creek composite placer gold deposit, largely mined, occupies large parts of sections 11, 12, 13, and 14, T. 11 S., R. 34 W., Kateel River Meridian. The map location is immediately north of the Nome-Teller road in the SE1/4SE1/4 section 11. The site is accurately located (Bundtzen and others, 1994, sheet 1). It is approximately the same as locality 138 of Cobb (1972 [MF 463]). In his description of location 138, Cobb lists Center, Flat, Holyoke, Lake, Saturday, Wonder, and Little Creek claims and two operating companies: Hammon Consolidated Gold Fields and U.S. Smelting and Refining Company. The field was also extensively mined by the Pioneer Mining Company. For convenience in this record, the composite placer deposit is hereafter referred to as the Nome placer field.

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Arsenopyrite, gold, hematite, ilmenite, magnetite, pyrite, scheelite**Gangue minerals:** Garnet**Geologic description:**

This complex Nome placer field formed where the rich Anvil Creek (NM236) alluvial deposit was reworked by marine processes. An ancestral Anvil Creek channel flowed southeasterly, turned south near modern Center Creek (not named on the 1970 revision of the topographic map but probably the drainage near the northeast runway at the Nome airport), and eventually merged with Submarine Beach (NM285 and NM286). The field spreads out along the Third Beach (NM258). It is very wide southwest of Third Beach through the area of buried auriferous abrasion platforms seaward of Third Beach. The deposit includes a large part of the richest portion of Third Beach between Little Creek to the west and Dry Creek to the east (Moffit, 1906, p. 134; Moffit, 1907, p. 134-144; Collier and others, 1908, p. 34, 162-163). The general location of the deposit as it was recognized in 1906 can be inferred from patterns of gold distribution shown by (Collier and others, 1908, plate X).

The deposit is mainly developed on schist bedrock, but higher level gold concentrations occur in fan and delta-like deposits formed at those times when an ancient Anvil drainage flowed into the ocean. The rather complex relations were summarized by Metcalfe and Tuck, 1942, p. 37): 'At the foothill edge of the coastal plain is an indistinguishable zone of intermixed stream and marine deposits. . . In this area, gold is found throughout the overburden, in horizons, in small stream channels, and as disseminations. Marine and stream gravel is often intermixed. When the shoreline was close to the hills, Anvil, Cooper, and Dry Creeks emptied gold-bearing detritus directly into the sea. In part this material formed an alluvial fan deposit and, when deposited directly into the sea, a delta. . . . Under such conditions, gold distribution is very erratic. Further from the foothills the gold occurs in more regular horizons.'

The field was first worked by drifting by the Pioneer Mining Company, especially between 1904 and 1910. The average value of an almost continuous drift mine 3,000 feet in length was 4.51 dollars or 0.22 ounce of gold per bedrock foot. Some of the ground contained an ounce of gold to the bedrock foot (Metcalfe and Tuck, 1942, figure 1). The area was mined hydraulically by the Pioneer Company from 1910 to 1922 and then by Hammon and Fairbanks Exploration companies from 1923 until 1934. During the period from 1904 until 1934, about 8,000,000 dollars (387,000 ounces of gold) was recovered from the area. The field furnished a significant amount of production of the Nome district (Bundtzen and others, 1994). The deposit was subsequently dredged until 1965. It was last mined as an open pit in 1994.

Placer gold at Nome is very close to 900 fine; Anvil Creek averages 897 and ranges from 894 to 905 (Metcalfe and Tuck, 1942, p. 41). Garnet was relatively abundant near Third Beach; sulfides, principally pyrite and arsenopyrite, locally occurred in concentrates seaward of Third Beach. In general, minerals in the concentrates are magnetite, ilmenite, scheelite, garnet, pyrite, and arsenopyrite. Based on testing done by Fairbanks Exploration Company in 1939, after stripping all available free gold with mercury, the sulfides appear to contain about 0.25 to 0.75 ounce of gold per ton. Metcalfe and Tuck (1942) strongly suggest that some of the gold, and therefore sulfides, could have come from marine erosion of the bedrock surface itself.

Alteration:**Age of mineralization:**

Pliocene (?) and Quaternary; sea-level fluctuations are very important in the history of this deposit.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986, model 39a); deltaic deposits, buried strandline beach deposits, and off-shore abrasion placers seaward from ancient beaches.

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

39a

Production Status: Yes; large

Site Status: Probably inactive

Workings/exploration:

A buried alluvial gold deposit was discovered in the canyon of Anvil Creek in 1898 by Lindblom, Brynteson, and Lindeberg, who later formed Pioneer Mining Company. The men also located placer claims on the coastal plain along an ancient buried channel of Anvil Creek that lies between Little and Dry Creeks. These claims covered important parts of the Nome placer field deposit. Extensive underground mining of this deposit occurred between 1904 and 1910. In late 1904, the Third Beach deposit (NM258) was discovered. In the Nome placer field area, the upland limit of the Third Beach deposit was sharp and against a bedrock escarpment. The beach deposits contributed to the richness of the ancient Anvil Creek channel, and related abrasion deposits were mined seaward from Third Beach. The deposit as finally mined includes the ancestral Anvil Creek channel, Third Beach, and abrasion and transient or remnant beaches on the abrasion platform offshore from Third Beach. After drifting, the deposit was mined by surface hydraulic methods, generally with hydraulic elevators, from 1910 to 1934; it was then dredged until 1965. Final production from the area, in the 1980's until 1994, was by open-pit operations that trucked ore to central washing plants. This long-mined field was probably the most important spatially continuous placer operation in the Nome mining district.

Production notes:

Production of about 8,000,000 dollars (387,000 ounces of gold) from 1904 to 1934 and extensive production after WW II.

Reserves:

The area has been extensively mined and has few remaining conventional reserves.

Additional comments:

References:

Moffit, 1906; Moffit, 1907; Collier and others, 1908; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Bundtzen and others, 1994.

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nome Beach and Abrasion Deposits**Site type:** Mine**ARDF no.:** NM252**Latitude:** 64.5259**Quadrangle:** NM C-1**Longitude:** 165.3871**Location description and accuracy:**

Four main gold-bearing beaches, Present Beach (NM255), Second Beach (NM256), Third Beach (NM258), and locally preserved Fourth Beach (NM259), constitute true strandline gold placer deposits of the Nome coastal plain; they are developed between Cape Nome and Cape Rodney. Present Beach is essentially continuous throughout this distance, the Second beach is almost continuous, and Third Beach is discontinuous. Discontinuous deposits such as Intermediate (NM287), Monroeville (NM-257) Submarine Beach (NM285), and Center Creek (NM286), occur in the same general area, but formed on submarine abrasion platforms offshore of the strandline deposits. The map location is the approximate center of the area of all onshore marine and beach deposits. It is in the NW1/4 section 24, T. 11 S., R. 34 W., Kateel River Meridian.

The deposits described in this record are essentially the same as the Nome Beaches of Cobb (1978 [OFR 78-93, p. 119-124]). Cobb's Nome Beaches category includes locality numbers 129, 135, 137-139, and 141-143 of Cobb (1972 [MF 463]). Note that location 138 has been described previously (NM251).

Commodities:**Main:** Ag, Au**Other:** W**Ore minerals:** Arsenopyrite, gold, hematite, ilmenite, magnetite, pyrite, scheelite**Gangue minerals:** Garnet**Geologic description:**

Three main strandline beach deposits exist at Nome, Present (also First or Modern), Second, and Third. With reference to modern sea level, these beaches formed, respectively, at current sea level, 38 feet and about 70 feet in elevation. There is some evidence of a fourth beach at an elevation of 120 feet, and there appear to be other fossil beachlines under the sea. The other so-called beaches (Monroeville, Intermediate, Submarine, and Center Creek) appear to have developed offshore on the seaward abrasion platforms of the beaches. The following general descriptions are largely based on Metcalfe and Tuck (1942).

Present Beach extends from Cape Nome to Cape Rodney. It was auriferous throughout, but it was richest near Nome. It formed by reworking marine sedimentary deposits that range from about 10 feet to more than 100 feet in thickness. Gold was characteristically very fine grained and commonly had to be saved by amalgamation. It occurred mainly in lens-like concentrations. Garnet was abundant, black sand less so.

Second Beach is nearly continuous, but interrupted by stream erosion at Penny River, Snake River, Nome River, and Hastings Creek. It has an average elevation of about 38 feet and occurred from a few hundred feet to 3,000 feet inland of Present Beach. Second Beach also formed mainly by reworking marine sediment. At Nome and near Snake and Penny Rivers, Second Beach appears to have formed on sand spits. West of Hastings Creek and at other places, this beach formed as the sea was encroaching on headlands composed of marine sediments. Most of the gold in Second Beach deposits, except near Otter Creek, was fine grained.

The highly productive Third Beach is discontinuous and is complex in origin. To the east of Nome near Hastings Creek, it apparently formed in an environment of lagoons and barrier bars and is not well developed or very productive. Near Irene and Cunningham Creeks and from Macdonald to near Little Creeks, it formed as a narrow strandline deposit against gravel headlands. It has been removed by erosion on Snake River, but it exists near Sunset Creek in the Nome C-2 quadrangle; it is productive only in a small area. Third Beach is present, but has not been productive, west of Sunset Creek.

Some other beach-like deposits, specifically the Intermediate, Monroeville, Submarine, and Center Creek deposits, appear to have formed in an offshore abrading environment as the sea advanced onto the shoreline. Sulfides, principally pyrite and arsenopyrite, are much more abundant in platform than in the strandline deposits. The lens-shaped beach deposits of gold in garnet or black sand characteristic of the strandline beaches are not well developed in the abrading marine environment. In general, gold in the marine abrasion platforms is coarser than in the strandline deposits. Several of the deposits have complex origins. The richest part of Submarine Beach could have formed near the mouth of ancestral Anvil Creek (Metcalf and Tuck, 1942).

Alteration:**Age of mineralization:**

Late Pliocene and Pleistocene.

Deposit model:

Lenoid deposits of fine gold associated with black and ruby sands in the true beach strandlines; disseminated and crudely stratabound concentrations formed in an offshore abrading environment.

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

Production Status: Yes; large

Site Status: Active

Workings/exploration:

Gold was discovered on Present Beach in 1899 and immediately gave rise to extensive production. Second Beach was discovered in 1902 and Third Beach was discovered in 1904. In 1906, Nome had its most productive year when more than 295,000 ounces of gold were produced (Bundtzen and others, 1994). The Intermediate Beach was discovered in 1906 and Submarine Beach in 1907. By 1908, the richest parts of the beaches were worked out, but major production continued in the abrasion areas seaward from the true beaches.

In general, production from the submerged deposits was by drift-mining and by large-scale hydraulic operations, until the development of cold-water thawing in the 1920's. The first two large dredges and thaw-fields were installed in 1923 (Brooks, 1925, p. 49). Extensive development by dredging did not take place until about 1930 as defects were worked out of the thawing process. The great dredging era was from about 1927 (Smith, 1930 [B 810]) until World War II (Smith, 1942). Dredges were reactivated after World War II and operated until about 1965. Two dredges operated after 1975 in the Dry Creek and Submarine Beach areas (Kastelic, 1975). From 1996 until 1998 all operations were truck-shovel open pits, with summertime washing.

Production notes:

Most of the production of the Nome district (NM250) has come from the strandline deposits and their related offshore abrasion deposits.

Reserves:

Resources locally remain in the remnants of the beach and abrasion deposits that have not been previously mined.

Additional comments:**References:**

Brooks, 1925; Smith, 1930 (B 810-A); Smith, 1942; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Kastelic, 1975; Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nome Offshore Placer deposits**Site type:** Mine**ARDF no.:** NM253**Latitude:** 64.5001**Quadrangle:** NM C-1**Longitude:** 165.4996**Location description and accuracy:**

The Nome Offshore placer area extends from Present Beach offshore for 2 miles to water depths of about 60 feet. It extends about 10 miles parallel to the modern strandline, commencing west of the the mouth of Nome River and continuing westward to the vicinity of Penny River. The map location is the southwest corner of the C-1 quadrangle, which is offshore, and in a known gold-bearing area.

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Arsenopyrite, gold, ilmenite, magnetite, pyrite**Gangue minerals:** Garnet**Geologic description:**

Gold occurs in offshore placer deposits off the coast of Nome, particularly from a point west of the mouth of the Nome River to near Penny River. From about 1960 to 1991, and especially from 1987 to 1990, there has been significant exploration and gold production. From mean lower low tide, the auriferous deposits extend seaward for about 2 miles. The origin of the deposits is complex and considered to be intimately related to the glacial history of the area (Hopkins and others, 1960). There are potential complications with this interpretation, but these are beyond the scope of this summary.

Some of the offshore gold is derived from the abrasion platform immediately offshore of the modern beach. Gold also occurs in lag deposits formed from weakly auriferous glacial drift and outwash far from the modern beach deposits. The glacial deposits are roughly centered on the projection of Snake River, before it makes an abrupt easterly turn to its present mouth. The offshore marine glacial deposits have been mapped by high-resolution seismic studies, first by Tagg and Greene (1973), then, using refined instruments and techniques, by Graul and others (1989). The gold in the auriferous glacial deposits was at least partly derived from gold-bearing alluvium in the ancestral Snake River. One interpretation is that productive placer deposits at Bangor Creek, Monument Creek, Boulder Creek, Glacier Creek, and Rock Creek were effectively cut off at the flood plain

of Snake River by a glacier that occupied the main valley of the ancestral river. Nelson and Hopkins (1972) reported that average offshore glacial till derived from this and possibly other glacial events contained 70 ppb of gold and that glacial outwash contained more. They also found that lag gravel on top of the till contained as much as 2,500 ppb gold and that one-third of their samples of materials enriched by lag processes contained more than 600 ppb gold. The gold in the relict concentrations was as much as several mm in diameter, and averaged about 1 millimeter in diameter and 1 milligram in weight. Probably most of the rich relict gravel is only about 30 centimeters (1 foot) thick.

Investigations carried out by the U.S. Geological Survey and the U.S. Bureau of Mines in the mid- to late 1960's followed extensive exploration by a minerals division of Shell Oil Company (Daly, 1969). Shell's work was followed by extensive exploration by ASARCO (Wojcik, 1974). Most of the Shell and ASARCO programs were done during the winter, off the seasonal ice shelf at Nome. Later work conducted by WestGold used Becker-type drills that drilled from vessels or off winter ice. Ultimately, more than 3,500 holes were drilled by Shell, ASARCO, and WestGold (Bronston, 1989).

The offshore gold deposits at Nome were mined by WestGold from 1987 to 1990, using a large bucket-line dredge. About 100,000 ounces of gold were recovered. The large dredge (the BIMA) successfully operated in difficult weather, but it was not an effective miner. The dredge diluted rich surface material with lower grade till, it could not mine rich near-shore accumulations of gold, and its bucket line catenary did not allow for the most efficient loading of buckets. Nevertheless, it was an impressive experiment. West-Gold also experimented with an undersea miner (Bosse, 1990). There remains a significant offshore resource of gold at Nome that could be mined under suitable economic conditions.

Alteration:

Age of mineralization:

Pliocene and Pleistocene.

Deposit model:

Placer; offshore, relict gravel, submerged beaches.

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

Production Status: Yes; small

Site Status: Active

Workings/exploration:

Some attempts were made to exploit offshore gold in the early years of the district, but they were unsuccessful largely because the machinery was poorly conceived or could not withstand the physical conditions. The first serious work began in the 1960's, when Shell Oil Company obtained leases on 2,750 acres offshore and drilled 568 holes (Daly, 1969). In 1967, the U.S. Bureau of Mines R/V Virginia City drilled more than 60 holes using a Becker-type rig. In that year and earlier, bottom samples were collected by the U.S. Geo-

logical Survey from several research vessels, using a clam-shell type sampler (Nelson and Hopkins, 1972). Shell's leases were acquired by ASARCO, who drilled 500 more holes (Wojcik, 1974). A prospect was identified by ASARCO, but it was subeconomic at the low early 1970's gold prices. The ASARCO leases were ultimately transferred through Inspiration Mining to Western Gold Mining and Exploration Ltd. (WestGold). In 1985, WestGold recovered about 885 ounces of gold by means of a clam-shell bucket mounted on sea-going barge. In 1986, WestGold acquired and rehabilitated the large bucket-line dredge (the BIMA; Rusanowski, 1989 and 1991). WestGold also did extensive environmental work (see, for example, Demlow and others, 1989) and continued making improvements in drilling techniques (Bronston, 1989). Significant work on sampling of low-grade offshore materials was done by Clifton and others (1967, 1969).

Production notes:

WestGold produced a significant amount of gold in its more or less experimental attempt at mining offshore Nome. In addition to their test mining in 1985, WestGold produced about 36,709 ounces of gold in 1987, 35,554 ounces in 1988, 30,882 ounces in 1989, and 15,208 ounces in 1990 (Rusanowski, 1989, 1991).

Reserves:

A gold resource for this region was calculated by Cecilia A. Bronston (1992; unpublished data, 1993) using a cut-off grade of 300 milligrams of gold per cubic meter. The total identified proven and probable ounces in nine deposits was 585,016 ounces at an average grade of 1,020 milligrams per cubic meter. The best single deposit was identified as Humpy. It has a proven and probable gold resource of 148,239 ounces and a grade of 1,327 milligrams per cubic meter. A total gold resource for the area could approximate 1,000,000 ounces.

Additional comments:

High-resolution seismic surveys initiated by the U.S. Geological Survey (Tagg and Greene, 1973) and further refined by industry (Graul and others, 1989) were effective in mapping glacial deposits, possible covered beach deposits, and channels.

References:

Metcalf and Tuck, 1942; Hopkins and others, 1960; U.S. Bureau of Mines, 1967; Clifton and others, 1967; Clifton and others, 1969; Daly, 1969; Nelson and Hopkins, 1972; Tagg and Greene, 1973; Wojcik, 1974; Rusanowski, 1989; Rusanowski, 1991; Demlow and others, 1989; Bronston, 1989; Graul and others, 1989; Bosse, 1990; Bronston, 1992.

Primary reference: Rusanowski, 1991

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nome Coastal Plain**Site type:** Mine**ARDF no.:** NM254**Latitude:** 64.5363**Quadrangle:** NM C-1**Longitude:** 165.4655**Location description and accuracy:**

The Nome Coastal Plain is the area between the Nome uplands and the present beach along Norton Sound, between Cape Rodney to the west, and Cape Nome. It has a maximum width of about 3.5 miles at Nome. The width of the coastal plain gradually decreases eastward for 12 miles to Cape Nome. It includes both alluvial and marine gold placers, but the marine placers are by far the most important. The map location is at the approximate center of the most important deposits. It is at the midpoint of the boundary of sections 15 and 16, T. 11 S., R. 34 W., Kateel River Meridian. These coastal plain deposits include localities 129, 135, 137, 138, 139, 141, 142, and 143 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag, W**Ore minerals:** Arsenopyrite, gold, ilmenite, magnetite, pyrite, scheelite**Gangue minerals:** Garnet**Geologic description:**

Pre-Pleistocene and Pleistocene marine and terrestrial sediments, especially near the major source areas of ancestral Snake River, Anvil Creek, and Nome River, contain small amounts of particulate gold. In the early days of the district, prospectors observed that they could obtain colors in sediments throughout the coastal plain (Brooks and others, 1901; Collier and others, 1908, plate X). Certain creeks cut only into the unconsolidated deposits. In those creeks, the gold disseminated in the terrestrial units and in marine sediments was locally concentrated into economic placer deposits by fluvial processes (Metcalf and Tuck, 1942). Such creeks include Bourbon Creek (NM288), Lower Dry Creek (NM264), below Newton Gulch (NM266), Stevens Creek (NM274), Moss Creek (NM275), Laurada Creek (NM276), and Hastings Creek (NM298). All of these deposits are relatively young and were formed after marine transgression and deposition. Another class of coastal plain alluvial placer deposits formed before marine erosion. These deposits include the ancestral Anvil Creek (see Nome Placer Field, NM251), the Roxie placer

and Newton Gulch (NM266). These streams cut headward into bedrock and flowed into the sea at the time Third Beach was formed. Subsequently, the channels were buried and preserved. Metcalfe and Tuck (1942, p. 26) also proposed that Evening Gulch, above the Sunset Creek (NM173) part of the Third Beach, is an old bedrock channel.

Another type of buried placer deposit exists in lower parts of Snake and Nome Rivers and in Otter Creek. The lower 2 miles of Snake River has cut 50 feet below sea level and about 30 feet into bedrock. This part of the Snake River, as well as lower Nome River and lower Otter Creek, contain thick alluvial deposits.

All of the shallow alluvial channels of the coastal plain, both in unconsolidated deposits and in schist bedrock, were discovered and mined in the early days of the Nome district. They had relatively minor production, although the ancestral Anvil Creek drainage was a main gold source for the marine deposits.

The most important deposits of the coastal plain are the Present, Second, and Third beach strandline deposits; also present are Intermediate, Monroeville, and Submarine beach deposits. Submarine Beach is the oldest deposit certainly known (Metcalf and Tuck, 1942, p. 47). Metcalf and Tuck believed that Submarine Beach was an eroded beachline that formed when sea level stood at about 40 feet and when the coastal plain was rolling hills traversed by an ancestral Anvil Creek. As envisaged by these authors, 'The sea advanced landward, and the Submarine area with its gold concentration was left behind on the abrasion platform. The sea continued to erode into bedrock gold-bearing sources which included the old Anvil Creek channel . . . and as it advanced, it carried a gold concentration on the beach before it. Likewise as the sea continued to advance, its abrasion platform was progressively being lowered so that any gold on its abrasion platform, such as the Submarine concentration, was gradually carried to a lower elevation.' Continued sea advances partially eroded and redistributed concentrations at the Intermediate and Monroeville so called beaches. At the same time, gold continued to be brought from the landward end of the system by ancestral Anvil, Newton, and Dry Creeks, and complex alluvial-marine deposits formed where these creeks entered the sea.

Alteration:

Age of mineralization:

Pliocene and Pleistocene.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a); marine and complex placer deposits.

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

39a

Production Status: Yes

Site Status: Active?

Workings/exploration:

Exploration and production began with the discovery of Present Beach in 1899 and continued intermittently until 1998.

Production notes:

Reserves:

Additional comments:

References:

Brooks, Richardson, and Collier, 1901; Collier and others, 1908; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Present (First) Beach**Site type:** Mines**ARDF no.:** NM255**Latitude:** 64.4999**Quadrangle:** NM C-1**Longitude:** 165.4262**Location description and accuracy:**

Present Beach is the active beach along the coast of Norton Sound near Nome. It extends southeast for about 12 miles from the mouth of Snake River to Cape Nome and northwest about 18 miles from Snake River to Quartz Creek in the Nome C-3 quadrangle (NM159).

The most important part of the Present Beach placer was approximately centered on the mouth of Snake River (as in figure 7, Collier and others, 1908) and is in the Nome C-1 and B-1 quadrangles. The map location is where Present Beach crosses the boundary between the Nome C-1 and B-1 quadrangles. It is near the west end of the south edge of section 26, T. 11 S., R. 34 W., Kateel River Meridian. Present Beach is locality 142 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold, ilmenite, limonite, pyrite**Gangue minerals:** Garnet**Geologic description:**

Gold was discovered in Present Beach in 1899, about one year after the discovery of alluvial gold in Anvil and other creeks. Geologist A.H. Brooks of the U. S. Geological Survey examined the deposits in 1899 and 1900 and provided a first-hand scientific account of the beach (Brooks and others, 1901, p. 85-91). According to Brooks, ' . . . the lowest bench of the coastal plain ends in an escarpment, 10 to 20 feet high on the seaward side. From the base of the escarpment the beach slopes to the sea at an angle of 4 to 5 [degrees], having a width of 50 to 75 yards. Ordinarily the wave action is confined to the lower third, but during severe storms the surf sometimes rolls up the full width of the beach. . . . The beach sand consists largely of quartz, usually stained with iron, and mica and chlorite schist fragments. Reddish garnets form an important constituent, sometimes predominating. . . . Magnetite is always present, but usually forms less than 1 per cent by weight, though in the concentrated form found in the pay streaks it may run as high as 10

per cent.' Brooks' associate, A. J. Collier, found that most of the beach material was coarser than 60 mesh and that garnet constituted about 4 to 5 per cent by weight.

Most of the placer formed on or above a blue clay substrate that dipped slightly more steeply than the beach, so that clay often was commonly found at a depth of about 5 to 7 feet half-way down the beach. The pay occurred as thin lenses that rarely could be traced for more than a few hundred feet. The maximum thickness of pay lenses was about 3 feet. The average paystreak sands were somewhat finer than the average beach sands and contained more of the denser minerals.

Gold was generally fine grained; some small nuggets weighed as much as 0.05 ounce. The gold was about 890 fine and flaky, and it amalgamated readily. Schrader and Brooks (1900) proposed that the major part of the gold in the beach placers was derived by wave action and concentration of underlying, weakly auriferous and largely unconsolidated material, a mechanism generally accepted by later geologists such as Metcalfe and Tuck (1942).

At the time of the Collier report on activities through 1906 (Collier and others, 1908), beach production totaled about 2,000,000 dollars, or somewhat less than 100,000 ounces at the 20.67 dollars per ounce price of gold. Most of this was derived from the central part of Present Beach, and about one-half was produced in the discovery year (1899). About 350,000 dollars worth of gold (17,000 ounces) was mined in 1900, and production continued to decline thereafter. To some extent, gold concentrations of Present Beach are replenished by winter storms each year, and a small production continues to the present (2000).

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39, strandline marine placer

Production Status: Yes

Site Status: Active

Workings/exploration:

Gold on Present Beach was discovered in 1899, and production began immediately. Approximately half of the total production from this beach occurred in 1899 (about 1,000,000 dollars or about 50,000 ounces). About 350,000 dollars or 17,000 ounces of gold were recovered from the beach in 1900. Probably at least 80 percent of the total production came from the part of the beach near Nome. At first, mining was by pan and rockers, but gold was also mined with pump and sluice setups, essentially all by hand shovel-in methods (Schrader and Brooks, 1900; Brooks and others, 1901; Collier and

others, 1908; Metcalfe and Tuck, 1942).

Production notes:

The most important year of production was 1899, when about 1,000,000 dollars, or about 50,000 ounces of gold were recovered. About 350,000 dollars, or 17,000 ounces of gold were recovered in 1900. Some production continues (2000) and can be expected to continue almost indefinitely. Total production is probably about 100,000 ounces of gold.

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Brooks and others, 1901; Collier and others, 1908; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Brooks and others, 1901

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Second Beach**Site type:** Mine**ARDF no.:** NM256**Latitude:** 64.4759**Quadrangle:** NM B-1**Longitude:** 165.2010**Location description and accuracy:**

Second Beach is a raised Quaternary strandline that formed during a seastand at about 38 feet above current sea level. It lies a few hundred to 3,000 feet inland of Present Beach (NM255). This beach can be traced westerly from near Hastings Creek, but it is absent where its trace is crossed by Hastings Creek, Nome River, Snake River, and Penny River. The map location is where Little Derby Creek crosses Second Beach, about 6.5 miles southeast of Nome. It is just inside the east boundary of section 2, T. 12 S., R. 33 W., Kateel River Meridian. Second Beach is locality 135 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). Other Second Beach locations are near Penny River and about 2 to 5 miles east of Penny River (NM178 and NM179).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold, ilmenite, magnetite, pyrite**Gangue minerals:** Garnet**Geologic description:**

Second Beach was discovered in 1902 near Peluk Creek; it is termed Second Beach because it was the second beach deposit discovered in the district (Metcalf and Tuck, 1942). Development of the deposit by drift mining started almost immediately (Brooks, 1905; Moffit, 1906; Collier and others, 1908). Except for gaps near Penny, Snake, and Nome Rivers, and Hastings Creek, the Second Beach is nearly continuous, although not everywhere mineable. Metcalf and Tuck (1942) interpret the absence of the beach at Penny, Nome, Snake and Hastings, as an absence in sedimentation--'the beach may never have existed here as the [ancestral] streams were flowing into the Second Beach sea at this time.' The beach has been removed by erosion where intersected by Cunningham and Peluk Creeks.

The beach appears to have formed in different depositional environments. East of Hastings Creek, Metcalf and Tuck (1942) inferred that it formed on an offshore bar. West of Hastings to near Little Derby Creek, and between Otter and Dry Creeks, the beach is at

the base of an old escarpment eroded into older marine sediments. In general, gold occurs on clay false-bedrock, but it appears to lie on schist bedrock for a short distance between Peluk and Otter Creeks (Kastelic, 1975; Metcalfe and Tuck, 1942). At the Snake and Nome Rivers, local beaches appear to have formed on sand spits near the mouths of ancestral channels of these drainages.

The beach was generally buried by 10 to 25 feet of frozen sand and gravel. In some areas overburden was very thin and the beach was surface mined, but most of the beach was drift mined over beach widths of 10 to 100 feet. As on Present Beach, gold was fine and flaky and commonly associated with garnet-rich sand. The deposit appears to have been exceptionally rich just west of Otter Creek where 75,000 dollars worth (3,750 ounces) of coarse gold reportedly were recovered. Total production to 1911 was reported by Metcalfe and Tuck (1942) to be about 600,000 dollars (30,000 ounces). Not more than 100,000 dollars (5,000 ounces) has been recovered since then.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer; buried beach.

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

Production Status: Yes

Site Status: Active?

Workings/exploration:

Second Beach was discovered in 1902 near Peluk Creek, which had eroded through the deposit. Once known, the beach was easily recognized because it was marked by a surface escarpment about 10 to 40 feet high (Collier and others, 1908). The original prospectors recognized beach characteristics such as rounded quartz pebbles, marine shells, and remnants of marine vertebrates.

Production notes:

Possibly about 700,000 dollars, or 34,000 ounces of gold, were recovered, mostly before 1912.

Reserves:**Additional comments:****References:**

Brooks, 1905; Moffit, 1906; Collier and others, 1908; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Kastelic, 1975; Cobb, 1978 (OFR 78-93).

Primary reference: Tuck and Metcalfe, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Monroeville Beach**Site type:** Mine**ARDF no.:** NM257**Latitude:** 64.5312**Quadrangle:** NM C-1**Longitude:** 165.4096**Location description and accuracy:**

Monroeville Beach is a buried gold placer on bedrock at an elevation of about 35 to 45 feet. It is buried by deposits of the Nome coastal plain in an area where surface elevations range from about 100 to 125 feet. It is about 2 miles inland from the modern beach at Nome and extends in a northwest-southeast direction semi-parallel to the modern beach for about 1.5 miles between Little Creek and Bourbon Creek. The Saturday Creek (NM294) placer mine appears to be located on the trace of Monroeville Beach about a half mile west of Bourbon Creek. The map location is at the eastern end of placer workings along Monroeville Beach, in the SE1/4 section 14, T. 11 S., R. 34 W., Kateel River Meridian. This is locality 129 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Arsenopyrite, gold, magnetite, pyrite**Gangue minerals:****Geologic description:**

Monroeville Beach is an abrasion platform gold placer deposit at about 35 to 45 feet above sealevel that developed as Third Beach was being formed. The main deposit was traced for about a mile between Little and Holyoke Creeks (Moffit, 1913, p. 119). The placer continues as a low-grade deposit to a point just west of Dry Creek and possibly below Newton Gulch to Otter Creek (Metcalf and Tuck, 1942).

The width of the deposit in its productive section near Center Creek was 300 to 500 feet. Much of the detritus associated with the gold was coarse grained, and ruby sand was lacking. The gold also was coarse-grained; it mainly occurred in about a 1-foot-thick zone above schist bedrock. About 2 to 3 feet of schist were mined with the pay gravel. Arsenopyrite, pyrite, and magnetite were abundant in concentrates. The placer deposit was covered by about 50 feet of frozen gravel and muck.

Tuck and Metcalfe (1942, p. 33 and 35) proposed that the Monroeville so called beach and other similar deposits was formed as an advancing sea eroded and redistributed a

previously existing beach deposit. Unlike the strandline beaches, the abrasion deposits are not marked by an upper escarpment.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer; marine abrasion platform deposit.

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

Production Status: Yes

Site Status: Active?

Workings/exploration:

Mostly worked by drifting from shafts. The deposit was discovered about 1906.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Third Beach**Site type:** Mines**ARDF no.:** NM258**Latitude:** 64.5402**Quadrangle:** NM C-1**Longitude:** 165.3647**Location description and accuracy:**

Third Beach is a buried strandline placer in the inner part of the Nome coastal plain. Near Irene Creek in the Nome B-1 quadrangle, the beach is about 1.5 miles from the coast; at Otter Creek it is about 2.5 miles from the coast, and in the Nome Placer Field (NM251) it is about 3 miles from the coast. The map location is near the north end of the boundary between section 13, T. 11 S., R. 34 W., and section 18, T. 11 S., R. 33 W., Kateel River Meridian. A placer gold deposit on Sunset Creek (NM173) is also on the Third Beach. Third Beach is locality 137 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** Ag**Ore minerals:** Gold**Gangue minerals:** Garnet**Geologic description:**

The Third Beach buried beach placer was discovered in 1904 in exploration shafts. It lies on bedrock at an elevation of about 79 or 80 feet near Little Creek (Moffit, 1907). Exploration and development were rapid, and by 1908 most of the deposit that could be drift mined was exhausted. The beach proved ultimately to be much larger and richer than Present and Second Beaches.

The trace of the beach forms an arch nearly touching Present Beach near Cape Nome and Cripple River, but it is almost 3.5 miles from shore at its central point near Little Creek (outlined by Collier and others, 1908, p. 161). Except for gaps near Snake River and Nome River, Third Beach is nearly continuous, but it is not everywhere rich enough to mine. The richest part is between Little Creek and McDonald Creek, a distance of about 4.5 miles. Third Beach varies in its character, but it is extensively gold-bearing, especially east of Snake River. Near Hastings Creek (Nome B-1 quadrangle), Third Beach is a wide, but low-grade placer deposit that extends as far north as Edna Creek. It appears to have developed on a shifting shore line, barrier bars, and lagoons. About 2.5 miles to the northwest, near Irene Creek and extending to Cunningham Creek, the shoreline abut-

ted against a gravel headland; the beach there is narrow and well defined (Metcalf and Tuck, 1942, p. 31-32). The beach probably did not form in the vicinity of the ancestral Nome River. A weak strandline on the east side of Nome River, at the elevation of Third Beach, trends south-southeast through Stevens (NM274), Moss (NM275), and Laurada (NM276) Creeks. From upper McDonald to Little Creeks on the west side of Nome River, the beach was confined by schist bedrock and developed a narrow but very rich series of deposits. Overburden above the beach was mainly frozen and ranged from a few feet thick in lower McDonald Creek to about 120 feet thick between Otter and Little Creeks.

Sediments of Third Beach are more angular than those of Present and Second Beaches; they also contain less garnet. Locally, the deposit was mined over a width of more than 300 feet, partly along the true strandline

An outer--seaward--zone was called the 'slough over'; it formed offshore as the strandline beach was being formed. The slough over commonly was separated from the strandline beach by a line of quartz cobbles and small boulders (Gibson, 1911; Moffit, 1913, p. 114). It was not as rich as the strandline beach. The slope of the slough over zone is similar to that of Present Beach, about 1 foot in 10, increasing in the off-shore part of the zone. Moffit (1913, p. 114) recognized three main deposits of mixed alluvial and marine sediments. These deposits were near Little Creek at the mouth of ancestral Anvil Creek; at Bourbon Creek, the mouth of ancestral Dry Creek; and at Irene Creek, the postulated ancient mouth of Osborne Creek. The gold was relatively coarse near Little Creek; in areas of beach deposits farther from alluvial placers, it was similar in size to that found on Present and Second Beaches.

Some of the deposits along Third Beach were extremely rich. On the May Fraction a streak 100 feet long, 15 feet wide, and only a few inches thick yielded 330,000 dollars worth of gold (in dollars of about 1910), some pans exceeding 500 dollars in value.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Placer; buried beach (Cox and Singer, 1986; part of model 39a).

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

39a

Production Status: Yes

Site Status: Active?

Workings/exploration:

Third Beach was discovered in 1904 in exploration shafts near Little Creek. Most of the deposits rich enough to drift mine were exhausted by 1908. Some deposits then were mined in hydraulic open-pits using hydraulic lifts. Starting in the 1920's, with the devel-

opment of cold-water thawing, several areas were dredged. Dredging started again in the 1970's and lasted until about 1994.

Production notes:

Extensive production took place but estimates of the amount of recovered gold are not available.

Reserves:**Additional comments:****References:**

Moffit, 1907; Collier and others, 1908; Gibson, 1911; Moffit, 1913; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Fourth Beach**Site type:** Occurrence**ARDF no.:** NM259**Latitude:** 64.5508**Quadrangle:** NM C-1**Longitude:** 165.3857**Location description and accuracy:**

Fourth Beach is the highest elevation auriferous strandline now known on the Nome coastal plain (Hopkins and others, 1960; Nelson and Hopkins, 1972; Tagg and Greene, 1973; Cobb, 1973 [B 1374, figure 29, p. 87]). The elevation of the Fourth Beach strandline is 125 feet. It is preserved at the base of Anvil Mountain, where it is buried by colluvium. The map location is about on Cooper Gulch at a surface elevation of 250 feet. It is in the west-central part of section 12, T. 11 S., R. 34 W., Kateel River Meridian. The location is accurate within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Garnet**Geologic description:**

Fourth Beach represents the farthest advance of the sea in Quaternary time, and it has been recognized only at the base of Anvil Mountain. It formed as a true strandline beach by waves impinging upon bedrock. Unlike Third Beach, which terminates landward on a prominent scarp marked by long-continued erosion at that sea level, Fourth Beach is an inconspicuous strandline that evidently formed during a relatively short seastand. It is not generally rich enough to mine. Probably some of the gold that was concentrated at Fourth Beach sea level was eroded seaward before the beach was buried by mass-wasting deposits. Hopkins and others (1960, p. 47-48) noted that the sediments of Fourth Beach are overlain by drift of the Nome River glaciation and that the seaward edge of the deposits is truncated at the Third Beach escarpment. They postulated that Fourth Beach may have formed during some part of Submarine Beach time or during an otherwise unidentified interglacial interval. Nelson and Hopkins (1972) diagrammatically show Fourth Beach at the base of Anvil Mountain (also see Cobb, 1973 [B 1374, figure 29]).

Alteration:

Age of mineralization:

Pleistocene.

Deposit model:

Placer Au; buried, strandline beach deposit (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

There is no substantial production from Fourth Beach. Gold originally concentrated on this beach could have been eroded and reconcentrated in alluvial deposits below the beach.

Production notes:**Reserves:****Additional comments:**

Considered too low grade to be of economic interest.

References:

Hopkins and others, 1960; Nelson and Hopkins, 1972; Tagg and Greene, 1973; Cobb, 1973 (B 1374).

Primary reference: Nelson and Hopkins, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Extra Dry Creek**Site type:** Mine**ARDF no.:** NM260**Latitude:** 64.5658**Quadrangle:** NM**Longitude:** 165.2840**Location description and accuracy:**

This alluvial gold placer mine is on Extra Dry Creek, an east tributary to Nome River. The map location is at about the midpoint of the creek, just northwest of the center of section 4, T. 11 S., R. 33 W., Kateel River Meridian. It is locality 119 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

The alluvial gold placer deposit in the upper canyon of Extra Dry Creek was worked by hand and produced about 1,000 ounces of gold between 1900 and 1903 (Brooks and others, 1901; Collier and others, 1908). The unconsolidated deposits about one-half mile below the head of the creek included, top to bottom, 1 foot of muck, 1 foot of sandy clay, and 6 feet of schist and quartz gravel on bedrock; pay was in the lower 2 feet of gravel. Some coarse gold was recovered; the largest nugget found in 1900 was about 0.6 ounce (Brooks and others, 1901; Moffit, 1913). Bedrock has been mapped as mica schist containing marble interlayers (Brooks and others, 1901; Moffit, 1913), mainly metagranodiorite (Hummel, 1962 [MF 247]), and mainly porphyroclastic micaceous graphitic schist and graphitic quartz schist (Bundtzen and others, 1994). The gold possibly had a local bedrock source; it apparently becomes finer grained downstream. Some of the gold had attached quartz (Collier and others, 1908, p. 176).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Extra Dry Creek was worked by shovel-in or rocker methods from 1900 until about 1905. Moffit (1913) thought that the creek was worked out by about 1905 or 1906. Tailings along the creek down to the Nome River road and suggest that the lower part of the creek was worked mechanically in later years.

Production notes:

About 1,000 ounces of gold were recovered from this creek between 1900 and 1903 (Collier and others, 1908; Moffit, 1913). Lower grade deposits may have been mined on the lower creek in later years, but records of any such production are not available.

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Cooper Gulch (placer and M. Charles lode occurrence)

Site type: Mine

ARDF no.: NM261

Latitude: 64.5560

Quadrangle: NM

Longitude: 165.3805

Location description and accuracy:

This site is in Cooper Gulch on the south side of Anvil Mountain. The site includes alluvial placer gold deposits in upper and lower Cooper Gulch and a calcite lode in upper Cooper Gulch (Cathcart, 1922, figure 18, location 1). The map location is about half way up the gulch from the inland margin of the coastal plain and just inside the north boundary of section 12, T. 11 S., R. 34 W., Kateel River Meridian. This is locality 103 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold, limonite

Gangue minerals: Calcite

Geologic description:

Upper Cooper Gulch was placer mined by rocker and hydraulic methods and produced a small amount of gold between 1900 and 1916 (Cobb, 1978 [OFR 78-93]). A small area near a bench where the gulch merges with the coastal plain apparently yielded good returns in gold (Moffit, 1913). Unconsolidated materials included 8 to 10 feet of low-grade gravel below 1 to 4 feet of overburden. Boulders in hydraulic tailings were mostly marble along with some greenstone and granite (Collier and others, 1908). Bedrock is mostly marble and schist that probably are of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1984; Bundtzen and others, 1994).

An ancestral Cooper Gulch may have been the source of gold on Fourth Beach (NM249) into shallow alluvial deposits on the coastal plain. Moffit (1913, p. 123-124) thought the lower Cooper Gulch deposit unusual enough to classify it as a 'gravel-plain placer'. The gold on lower Cooper Gulch mainly lay on clay streaks but also was distributed throughout the section. The deposit may have been a fan or delta from ancestral Cooper Gulch into the Third Beach sea.

The M. Charles lode was also reported from near the head of Cooper Gulch on the west side (Cathcart, 1922, figure 18, location 1). A short tunnel on the west bank of Cooper

Gulch follows a fault zone about 4 feet wide containing brecciated schist replaced by ferruginous calcite; there is abundant limonite but no evidence of gold. Cathcart (1922) inferred the former existence of sulfide minerals from the limonite.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

One hydraulic pit was 100 by 300 feet in size in 1903 (Collier and others, 1908). An attempt was made to mine the lower Cooper Creek deposit by dredging (Moffit, 1913). Upper Cooper Gulch was mined by hand methods.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Newton Gulch**Site type:** Mine**ARDF no.:** NM262**Latitude:** 64.5398**Quadrangle:** NM C-1**Longitude:** 165.3234**Location description and accuracy:**

This alluvial gold placer mine is on Newton Gulch, a south-flowing tributary to Dry Creek. The map location is about the midpoint of Newton Gulch, in the NW1/4 section 17, T. 11 S., R. 33 W., Kateel River Meridian. It is locality 127 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is accurate within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer mining was under way on Newton Gulch by 1900 when about 500 ounces of gold were produced (Brooks and others, 1901). Considerable mining, including dredging from 1930 to 1932, took place on lower parts of the creek, where it enters the Nome coastal plain and crosses Third Beach (NM258) and Fourth Beach (NM259). At the edge of the coastal plain, pay was in the lower 2 to 8 feet of 6- to 27-foot-thick stream gravels 30 to 150 feet wide. Upstream, in the steeper parts of the gulch, the pay was on schist bedrock, but on the coastal plain, pay was on clay false bedrock about 10 feet below the surface (Collier and others, 1908). Near the mouth of Newton Gulch, some deposits contained very rich streaks that carried more than 0.7 ounce of gold per cubic yard. About 4,000 feet mile upstream of the mouth, pay ran about 0.1 ounce gold per cubic yard. Some hillside gravels were also placer mined near Newton Gulch. Work by U.S. Smelting, Refining, and Mining Company (Metcalf and Tuck, 1942, p. 25, figure 4C) indicated that Newton Gulch was a bedrock tributary into the Third Beach sea.

Bedrock in Newton Gulch is mostly marble and schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1994; Bundtzen and others, 1994). The marble and schist unit is in contact with another schist unit in the headwaters of Newton Gulch, the site of a lode gold prospect is present (NM263).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

The Newton Gulch placer was mined by hand, probably using small-scale open cuts and hydraulic operations and by dredge from 1930 to 1932.

Production notes:

About 500 ounces were produced in 1900, but placer mining, including some dredging, continued intermittently at least to 1932.

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Metcalfe and Tuck, 1942; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Homburger (Newton Gulch)**Site type:** Prospect**ARDF no.:** NM263**Latitude:** 64.5437**Quadrangle:** NM C-1**Longitude:** 165.3214**Location description and accuracy:**

The Homburger lode prospect is at an elevation of about 325 feet in upper Newton Gulch (NM262), on the south flank of Newton Peak. The map location is in the SW1/4 section 8, T. 11 S., R. 33 W., Kateel River Meridian. This is locality 53 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, limonite, pyrite**Gangue minerals:** Quartz**Geologic description:**

About a dozen exploration shafts, some almost 100 feet deep, were dug on oxidized, limonite-stained, decomposed bedrock near a schist-marble contact in the headwaters of Newton Gulch (Smith, 1909; Mertie, 1918 [B 662-I, p. 425-449]). The deposit consists of pyrite in quartz stringers and as disseminations on the schist. Composite samples averaged about 0.25 ounce of gold per ton (Mertie, 1918; Cathcart, 1922). Bedrock in Newton Gulch is mostly amarlite and schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1994; Bundtzen and others, 1994). The marble-schist unit is in contact with another schist unit near this prospect.

Alteration:

Oxidation.

Age of mineralization:

Mid-Cretaceous or younger; veins cut schist metamorphosed in the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: No**Site Status:** Probably inactive**Workings/exploration:**

About a dozen shafts and at least 2 churn-drill holes had explored this prospect by 1918 (Mertie, 1918 [B 662-I, p. 425-449]).

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1909; Mertie, 1918 (B 662-I); Cathcart, 1922; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Mertie, 1918 (B 662-I, p. 425-449)**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Lower Dry Creek**Site type:** Mine**ARDF no.:** NM264**Latitude:** 64.5211**Quadrangle:** NM C-1**Longitude:** 165.3425**Location description and accuracy:**

This gold placer mine is at an elevation of about 100 feet on lower Dry Creek about 2.5 miles upstream of its mouth. The map location is just east of the center of section 19, T. 11 S., R. 33 W., Kateel River Meridian. This is locality 127 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, hematite, pyrite, scheelite**Gangue minerals:****Geologic description:**

Most of Dry Creek, starting about 1 mile upstream from its mouth, is auriferous. The placer deposit described in this record is the stretch from about Blind Gulch, where Dry Creek crosses the trend of Intermediate Beach (NM287), upstream to the mouth of Newton Gulch. Mining took place as early as 1900 and in most subsequent years to 1938 (Cobb, 1978 [OFR 78-93]). Most of the mining on the lower part of the creek was probably by open cut or dredging; dredges were reported to be operating on Dry Creek almost every year from 1920 to 1938. Dredging was resumed in this area in about 1975, and a dredge operated until 1994.

The first deposits mined on lower Dry Creek were shallow and fairly small. A shallow pay streak about 1 mile upstream from the mouth was 150 feet wide and 3 to 5 feet thick on a clay bottom; it commonly ran a little more than 0.2 ounce of gold per cubic yard (Moffit, 1913, p. 90-91); concentrates included hematite, pyrite, and scheelite. These deposits were partly mined with dredges with digging capacity of 10 to 20 feet (Metcalf and Tuck, 1942, p. 26). In later years, buried deposits were extensively mined along modern Dry Creek. These deposits include some related to Third Beach and Intermediate Beach; the eastern extension of Submarine Beach is probably near the mouth of Dry Creek (Moffit, 1913, p. 118). Dry Creek marks the eastern limit of the richest part of Third Beach (Metcalf and Tuck, 1942).

Dry Creek was an active drainage during Third Beach time, dumping gold-bearing alluvium directly into the Third Beach sea (Metcalf and Tuck, 1942, p. 37). The deeper deposits below the Third Beach strandline and on abrasion platforms such as Intermediate Beach were mined until 1995 by dredges with as much as 80-foot digging capacity; locally, some of the deep deposits were naturally thawed.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer gold deposit (Cox and Singer, 1986; model 39a). Placer deposits were of several types including fluvial, marine, and complex fluvial-marine.

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

39a

Production Status: Yes; medium

Site Status: Active?

Workings/exploration:

Most of the mining on the lower part of Dry Creek was probably by open cut or dredging; dredges were reported to be operating on Dry Creek almost every year from 1920 to 1938. Mining took place up to at least 1995.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Metcalf and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Deer Gulch**Site type:** Mine**ARDF no.:** NM265**Latitude:** 64.5798**Quadrangle:** NM C-1**Longitude:** 165.3443**Location description and accuracy:**

This alluvial placer gold mine is on Deer Gulch, a north headwater tributary to Dexter Creek (NM303). The map location is at the mouth of Deer Gulch, just north of the center of section 31, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 118 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Deer Gulch is one of several small headwater tributaries of Dexter Creek (NM303) that head in areas where high-level auriferous gravels have been mined (for example, NM246 and NM247). Placer gold mining in these tributaries took place before 1908; some of the deposits were very rich (Brooks and others, 1901; Collier and others, 1908). Much of the placer gold in the headwaters of Dexter Creek, including Deer Gulch, is probably derived from reworking the high-level gravels.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Some small-scale surface placer mining took place on Deer Gulch before 1908.

Production notes:

Reserves:

Additional comments:

References:

Brooks and others, 1901; Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Grass Gulch**Site type:** Mine**ARDF no.:** NM266**Latitude:** 64.5779**Quadrangle:** NM C-1**Longitude:** 165.3492**Location description and accuracy:**

This alluvial placer gold mine is in Grass Gulch, a west headwater tributary to Dexter Creek (NM303). The map location is at an elevation of about 450 feet in the SW1/4 section 31, T. 10 S., R. 33 W., Kateel River Meridian. Grass Gulch is included in locality 118 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Grass Gulch is one of several small headwater tributaries of Dexter Creek (NM303) that head in areas where high-level auriferous gravels have been mined (for example, NM246 and NM247). The Grass Gulch placer was small but very rich, and the entire 15 feet of rounded-pebble gravel and some clay was gold-bearing. The deposit apparently was worked out by 1903 from a 150-foot by 300- or 400-foot pit (Collier and others, 1908). Gold was also recovered from fractured and creviced marble bedrock. Overburden was only 2 feet of moss and soil, some of the gravel was frozen, and granite clasts were uncommon in the gravel (Collier and others, 1908; Moffit, 1913). Much of the placer gold in the headwaters of Dexter Creek, including Grass Gulch, is probably derived from reworking of the high-level gravels.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:** Probably inactive**Workings/exploration:**

A 150-foot by 300- or 400-foot pit removed the main deposit by 1903 and most of the rest of the deposit was mined out by 1909 (Collier and others, 1908; Henshaw, 1910).

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Henshaw, 1910; Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Nekula Gulch; Nicolai Gulch**Site type:** Mine**ARDF no.:** NM267**Latitude:** 64.5897**Quadrangle:** NM C-1**Longitude:** 165.3621**Location description and accuracy:**

This alluvial placer gold mine is in Nekula Gulch, a headwater tributary to Anvil Creek (NM236). The map location is at an elevation of about 425 feet on lower Nekula Gulch in the SW1/4 section 30, T. 10 S., R. 33 W., Kateel River Meridian. It is included in locality 102 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The mine is located to within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Nekula Gulch heads in an area of auriferous high-level gravels that were drift mined at many places (for example, NM246). The nearby Caribou Bill mine (NM238) was very rich, contained coarse and angular gold, and was at least partly mined by surface operations. At Nekula Gulch, the 3-foot-thick gravels were gold-bearing throughout, but the richest pay was on bedrock. The Nekula Gulch placer was probably mostly derived from reworking the older, high-level gravels (Brooks and others, 1901; Collier and others, 1908; Moffit, 1913).

The Anvil Creek fault transects the area near Nekula Gulch. The Anvil Creek fault is a through-going, high-angle structure that juxtaposes pelitic and marble bedrock (Hummel, 1962 [MF 247]). Hummel mapped two strands of the Anvil Creek fault in this area; they are separated by graphitic strata. The bedrock is probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994; Bundtzen and others, 1994). Hummel also mapped granitic sills in this area. Bundtzen and others (1994) propose that Nekula Gulch is largely underlain by felsic metavolcanic rocks.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a), at least partly formed by reworking high-level bench gravel.

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

39a

Production Status: Yes; small

Site Status: Probably inactive

Workings/exploration:

Surface placer workings, dating back to 1900, are present on Nekula Gulch.

Production notes:**Reserves:****Additional comments:**

Nekula Gulch is underlain mostly by felsic metavolcanic rocks that may be mineralized (also see Aurora Creek, NM147).

References:

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Dewey Creek**Site type:** Mine**ARDF no.:** NM268**Latitude:** 64.6309**Quadrangle:** NM C-1**Longitude:** 165.2647**Location description and accuracy:**

This alluvial gold placer mine is on Dewey Creek, an east tributary to Nome River. The map location is at an elevation of about 150 feet, in the southwest corner of section 10, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 114 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:** W**Ore minerals:** Gold, magnetite, scheelite**Gangue minerals:** Garnet**Geologic description:**

Gold was discovered on Dewey Creek by 1900; it was in 3 feet of auriferous gravel on a sandy clay layer overlain by 1 foot of sandy blue clay and 1 foot of muck. The gold is accompanied by considerable scheelite and garnet and some magnetite (Brooks and others, 1901). Some mining apparently took place in 1903 (Collier and others, 1908). Dewey Creek is near the northeast extension of the Anvil fault; this fault juxtaposes massive marble against marble and schist in this area. These rocks may in part correlate with the Casadepaga Schist (Hummel, 1962 [MF 247]; Bundtzen and others, 1994). Locally, the Anvil Creek fault is a mineralized structure (for example, NM234) containing stibnite and possibly gold.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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 small-scale surface placer workings are probably present.

Production notes:

Reserves:

Additional comments:

References:
Brooks and others, 1901; Collier and others, 1908; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Brooks, Richardson, and Collier, 1901

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Grace Gulch**Site type:** Mine**ARDF no.:** NM269**Latitude:** 64.6079**Quadrangle:** NM C-1**Longitude:** 165.2017**Location description and accuracy:**

This gold placer mine is on Grace Gulch, a southeast headwater tributary to Buster Creek (NM304). The map location is on the south side of Grace Gulch at an approximate elevation of 325 feet and just inside the east-central edge of section 23, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 116 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Small-scale placer mining in 1902 and 1903 recovered about 60 ounces of gold from a bench along Grace Gulch (Collier and others, 1908). This bench is a possible continuation of the one mined on the south side of lower Buster Creek (NM304). A northeast-trending high-angle fault juxtaposes marble and schist units near this site (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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 workings may still be present at this location.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Union Gulch**Site type:** Mine**ARDF no.:** NM270**Latitude:** 64.6105**Quadrangle:** NM C-1**Longitude:** 165.2154**Location description and accuracy:**

This alluvial gold placer mine is on Union Gulch, a northeast headwater tributary to Buster Creek (NM304). The map location is at an elevation of about 250 feet, in the north-central part of section 23, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 116 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

The gravels in Union Gulch are only 10 to 20 feet wide and 30 inches thick, but they are auriferous and estimated to contain about 0.2 ounce of gold per cubic yard (Collier and others, 1908). The coarse and rusty gold is concentrated on bedrock. High-angle faults juxtapose marble- and schist-rich units in this area (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

It is not known if other than small-scale and local hand mining took place at this site.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): McDonald Creek**Site type:** Mine**ARDF no.:** NM271**Latitude:** 64.5109**Quadrangle:** NM C-1**Longitude:** 165.2499**Location description and accuracy:**

This alluvial gold placer mine is on McDonald Creek, a west tributary to lower Nome River. Its headwaters are on the older part of the Nome coastal plain where Third Beach (NM258) deposits are present. The map location is the midpoint of placer tailings that are present 4,500 feet upstream of the mouth; it is in the NW1/4 section 27, T. 11 S., R. 33 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

McDonald Creek heads on the Nome coastal plain, and flows across the projected trace of Third Beach (NM258). It has been placer mined for gold downstream from this trace at surface elevations between 50 and 100 feet. In upper McDonald Creek, Third Beach is buried by only a thin deposit of sand and gravel, and the creek cuts through the beach deposit (Metcalf and Tuck, 1942). The gold in McDonald Creek is entirely derived from reworking of coastal plain deposits, including those of Third Beach. Where upper McDonald Creek cuts Third Beach, its paystreak lay on fine sand (Moffit, 1913, p. 115), possibly itself a beach deposit, as is the case farther east near Hastings Creek.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:** Probably inactive**Workings/exploration:**

Placer mine tailings are locally present along McDonald Creek between surface elevations of 50 to 100 feet.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Metcalfe and Tuck, 1942.

Primary reference: Metcalfe and Tuck, 1942**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Tripple Creek**Site type:** Mine**ARDF no.:** NM272**Latitude:** 64.5268**Quadrangle:** NM C-1**Longitude:** 165.2518**Location description and accuracy:**

This alluvial gold placer mine is on Tripple Creek, a west tributary to lower Nome River. The map location is at the approximate midpoint of placer mine tailings that extend at least 5,000 feet along the creek starting about 1 mile upstream from the mouth. The map location is at an elevation of about 100 feet in the NW1/4 section 22, T. 11 S., R. 33 W., Kateel River Meridian. The mined part of Tripple Creek is mostly on the older part of the Nome coastal plain at surface elevations are 100 to 200 feet. The mine location is accurate to within a quarter mile.

Commodities:**Main:** Au**Other:** Sb**Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Tripple Creek heads in bedrock on the southeast side of Newton Peak, but it mostly flows across older parts of the Nome coastal plain and the Nome River flood plain. The part of the creek on the Nome coastal plain, between surface elevations of 50 and 150 feet, has been placer mined for gold. Records of the State and Territory of Alaska show three patented claims on Tripple Creek: Kardex site Kx 167 patented to U.S. Smelting and Refining Company; Kardex site Kx 258, U.S. Mineral Survey No. 1346 (Alaska Division of Geological and Geophysical Surveys, 1982; Heiner and Porter, 1972); Kardex site Kx 305, a bedrock claim in upper Tripple Creek, reportedly located for antimony (Heiner and Porter, 1972).

Bedrock including marble and light-colored, possibly metavolcanic schist is exposed in the mine. The mine was active at least through 1997 (Swainbank and others, 1997) and is assumed still to be active in 2000.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Active

Workings/exploration:

Placer mine tailings are present along Tripple Creek between surface elevations of 50 and 150 feet. The mine was active through 1997 (Swainbank and others, 1997). In addition to placer gold, construction products have also been produced during the recent operations. The mine was assumed to be active in 2000.

Production notes:**Reserves:****Additional comments:**

Patented claims reported.

References:

Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982; Swainbank and others, 1997.

Primary reference: Heiner and Porter, 1972

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Washington Creek; Washington Gulch**Site type:** Mine**ARDF no.:** NM273**Latitude:** 64.5230**Quadrangle:** NM C-1**Longitude:** 165.2037**Location description and accuracy:**

Washington Creek is a small east tributary to lower Nome River. It appears to have been placer mined over most of its less than 1 mile length. The map location is on lower Washington Creek at a surface elevation of about 50 feet. It is in the NE1/4 section 23, T. 11 S., R. 33 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, magnetite**Gangue minerals:** Garnet**Geologic description:**

Gold was discovered in Washington Creek by 1900. It was reported to be fine gold accompanied by magnetite and garnet on a clay bottom (Brooks and others, 1901). Moffit (1913) reported that gold was recovered on bedrock from a 10-inch-thick layer of fine sand resembling beach sand. Washington Creek appears to have been placer mined along most of its length at surface elevations between about 50 and 125 feet. The low elevation and physiographic setting suggest that coastal plain deposits could be present in parts of this drainage. The placer gold thus could be derived from reworking the coastal plain deposits. The Washington Creek placer is probably related in part to similar deposits on Stevens, Moss, and Laurada Creeks (NM274-276) that, in their lower elevations, appear to have developed on a weakly defined Third Beach formed on the bedrock of Army Peak (Metcalf and Tuck, 1942, p. 32).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mining tailings are present along the creek between surface elevations of about 50 to 125 feet; the deposit at about 70 to 75 feet elevation may be a weak Third Beach developed on Army Peak.

Production notes:

Reserves:

Additional comments:

References:

Brooks and others, 1901; Moffit, 1913; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Stevens Gulch**Site type:** Mine**ARDF no.:** NM274**Latitude:** 64.5208**Quadrangle:** NM C-1**Longitude:** 165.2001**Location description and accuracy:**

This alluvial gold placer mine is on Stevens Gulch, a small east tributary to Washington Creek (NM273). The map location is at a surface elevation of about 50 feet. It is just inside the east-central edge of section 23, T. 11 S., R. 33 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Fine gold on a clay false bedrock was reportedly discovered in Stevens Gulch by 1900. The deposit apparently is similar to the one nearby on Washington Creek (NM273) (Brooks and others, 1901). Stevens Gulch appears to have been placer mined between surface elevations of about 50 and 100 feet. The low elevation and physiographic setting suggest that coastal plain deposits could be present in parts of this drainage. The placer gold thus could be derived from the reworking of coastal plain deposits, including Third Beach at an elevation of 70 to 80 feet (Metcalf and Tuck, 1942, p. 32).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mine tailings are present along this creek at surface elevations of about 50 to 100 feet. At or below about 80 feet, the deposit could be derived by reworking a weakly developed Third Beach.

Production notes:

Reserves:

Additional comments:

References:

Brooks and others, 1901; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Moss Gulch**Site type:** Mine**ARDF no.:** NM275**Latitude:** 64.5094**Quadrangle:** NM C-1**Longitude:** 165.2038**Location description and accuracy:**

This alluvial gold placer mine is on Moss Gulch, a small east tributary to lower Nome River. Some small-scale placer mining appears to have taken place along about 1,000 feet of the creek at surface elevations of less than 50 feet. The map location is in the NE1/4 section 26, T. 11 S., R. 33 W., Kateel River Meridian. Moss Gulch is locality 122 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer mining for gold took place at a surface elevation of about 50 feet on lower Moss Gulch by dredging in 1911 and by open-cut in 1916 (Smith, 1912; Mertie, 1918 [B 662-I, p. 425-449]). Mining may have occurred at other times as well, but it has not been reported. The headwaters of Moss Gulch are at elevations and physiographic settings where coastal plain deposits could be present. The Moss Gulch deposit probably formed at least in part from reworking a weakly developed Third Beach (Metcalf and Tuck, 1942).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mine tailings are present on Moss Gulch at a surface elevation of about 50 feet.

Production notes:

Reserves:

Additional comments:

References:

Smith, 1912; Mertie, 1918; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Laurada Creek**Site type:** Mine**ARDF no.:** NM276**Latitude:** 64.5035**Quadrangle:** NM C-1**Longitude:** 165.2037**Location description and accuracy:**

This alluvial placer mine is on Laurada Creek, a small east tributary to lower Nome River. It has been placer mined over most of its 1 mile length. The map location is at an elevation of about 50 feet in the lower part of the creek in the SE1/4 section 26, T. 11 S., R. 33 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Laurada Creek has been placer mined over most of its 1-mile length, probably at about the same time as mining on nearby Moss Gulch (NM275). Mining may also have occurred at other times, but it has not been reported. The headwaters of Laurada Creek are at elevations and physiographic settings where coastal plain deposits could be present. The deposit probably formed in part from reworking a Third Beach deposit on the flank of Army Hill (Metcalf and Tuck, 1942, p. 32).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mine tailings are present on Laurada Creek at a surface elevation of about 50 feet. Claim activity was reported as recently as 1968 and 1974 (Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982).

Production notes:

Reserves:

Additional comments:

References:

Metcalf and Tuck, 1942; Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Metcalf and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): St. Michaels Creek**Site type:** Mine**ARDF no.:** NM277**Latitude:** 64.5413**Quadrangle:** NM C-1**Longitude:** 165.1490**Location description and accuracy:**

This alluvial gold placer deposit is on St. Michaels Creek, a south tributary to Osborn Creek (NM305). The confluence of Osborn and St. Michaels Creek is about 2 miles upstream of the mouth of Osborn Creek on Nome River. The map location is on placer mine workings in the lower part of the creek, 1,500 feet upstream of its mouth, in the NW1/4 section 18, T. 11 S., R. 32 W., Kateel River Meridian. St. Michaels Creek is included in locality 120 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

St. Michaels Creek has been extensively dredged for placer gold along its lower 3,000 feet. The mine workings are at surface elevations of about 50 to 75 feet. Specific information for St. Michaels Creek has not been reported, but the deposit may be similar in origin, tenor, and mining history to that on nearby Osborn Creek (NM305). St. Michaels Creek's low elevation and proximity to the lower Nome River valley suggest that Quaternary sea-level fluctuations probably influenced development of its placer deposits. Parts of St. Michaels Creek probably rework older coastal plain deposits.

St. Michaels Creek barely cuts down to an elevation where Third Beach could have existed in a re-entrant to the northeast side of Army Peak. Bedrock sources of gold could also be present; bedrock exposed in the area is mainly calc-schist, mica-chlorite schist, and marble with some graphitic quartz schist (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer gold tailings are present along the lower 3,000 feet of St. Michaels Creek, where it was extensively dredged.

Production notes:

St. Michaels Creek may have made significant contributions to placer gold production in this area.

Reserves:**Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (west of central Osborn Creek)

Site type: Prospect

ARDF no.: NM278

Latitude: 64.5856

Quadrangle: NM C-1

Longitude: 165.1141

Location description and accuracy:

This unnamed lode prospect is at an elevation of about 550 feet on the east flank of hill 1043, a few thousand feet north of central Osborn Creek (NM305). The map location is at the north edge of section 32, T. 10 S., R. 32 W., Kateel River Meridian. It is approximately located, probably to within one-half mile. It is locality 54 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au, Cu

Other:

Ore minerals: Azurite (?), chalcopyrite, gold, malachite (?), pyrite

Gangue minerals: Quartz

Geologic description:

This deposit consists of a quartz vein containing iron and copper sulfides, inferred to be pyrite and chalcopyrite. The vein is near a contact between schist and greenstone and is reported to have assayed from 0.2 to 2 ounces of gold per ton (Smith, 1908). Copper sulfide oxidation products, inferred to be malachite and azurite, are also present. Bedrock in this area is marble, schist, and local greestone (Hummel, 1962 [MF 247]). The prospect is within about one-half mile of the head of mining activity on Osborn Creek (NM305).

Alteration:

Oxidation of chalcopyrite to secondary copper minerals.

Age of mineralization:

Mid-Cretaceous or younger; vein cross cuts schist metamorphosed in the mid-Cretaceous.

Deposit model:

Low-sulfide Au-quartz veins (Cox and Singer, 1986; model 36a).

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

36a

Production Status: No**Site Status:** Inactive**Workings/exploration:**

Prospect pits are probably present.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Smith, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Lillian Creek**Site type:** Mine**ARDF no.:** NM279**Latitude:** 64.6052**Quadrangle:** NM C-1**Longitude:** 165.2453**Location description and accuracy:**

This alluvial gold placer mine is on Lillian Creek, a north tributary to Buster Creek (NM304), an east tributary to Nome River. The confluence of Lillian and Buster Creeks is 1.1 miles upstream of the mouth of Buster Creek. The map location is on lower Lillian Creek, 0.4 mile upstream of its mouth, in the SE1/4 section 22, T. 10 S., R. 33 W., Kateel River Meridian. Lillian Creek is included in locality 116 of Cobb (1972 [MF 463]; 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold, limonite**Gangue minerals:****Geologic description:**

Coarse, rough, and iron-stained (limonitic?) gold was recovered from gravel near schist bedrock on Lillian Creek. The gravel was 3 to 10 feet thick and was covered by 5 feet of overburden (Brooks and others, 1901; Collier and others, 1908). The pay was apparently spotty and the production small (Moffit, 1913). Bedrock in the drainage is marble and schist (Hummel, 1962 [MF 247]); boulders encountered in mining included schist, quartz, greenstone, and granite (Collier and others, 1908). Hummel (1962 [MF 247, locality 21]) mapped a prospect in the headwaters of Lillian Creek. (NM292) containing pyrite, arsenopyrite, and possibly pyrrhotite.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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 tailings and small surface workings are probably present. The deposit was mined in 1900 and possibly in subsequent years.

Production notes:

Pay was spotty and production small (Moffit, 1913).

Reserves:**Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Bonita Creek**Site type:** Prospect**ARDF no.:** NM280**Latitude:** 64.6362**Quadrangle:** NM C-1**Longitude:** 165.2009**Location description and accuracy:**

This alluvial placer prospect is on Bonita Creek, a west headwater tributary to Osborn Creek (NM305). Bonita Creek joins New Eldorado Creek to form Osborn Creek. Thirty-five claims were located here in 1967 (Kardex site Kx 52-285 for gold and scheelite (?), Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). The map location is at a surface elevation of about 475 feet, just inside the east-central edge of section 11, T. 10 S., R. 33 W., Kateel River Meridian. It is approximately located to within 1 mile.

Commodities:**Main:** Au, W**Other:****Ore minerals:** Gold, scheelite**Gangue minerals:****Geologic description:**

Placer mining claims were staked on Bonita Creek in 1967. Hudson and DeYoung (1978) reported a resource estimate of 1.1 to 1.5 million cubic meters of placer ground containing 1 to 2 grams of gold and 190 grams of tungsten per cubic meter. The tungsten values are inferred to reflect the presence of placer scheelite. Bonita Creek drains an area where marble and schist bedrock is cut by high-angle faults including the eastward extension of the Anvil fault (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au and scheelite (?) deposit (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None**Site Status:** Probably inactive**Workings/exploration:**

Prospecting had taken place on Bonita Creek, but no workings are known; 35 claims were recorded in 1967 (Heiner and Porter, 1972).

Production notes:**Reserves:**

Hudson and DeYoung (1978, p. 45) reported an estimated resource of 1.1 to 1.5 million cubic meters of placer ground containing 1 to 2 grams of gold and 190 grams of tungsten per cubic meter.

Additional comments:**References:**

Hummel, 1962 (MF 247); Heiner and Porter, 1972; Hudson and DeYoung, 1978.

Primary reference: Hudson and DeYoung, 1978**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Unnamed (placer mine west of Nome River)

Site type: Mine

ARDF no.: NM281

Latitude: 64.6204

Quadrangle: NM C-1

Longitude: 165.3187

Location description and accuracy:

Placer mine tailings were mapped by Bundtzen and others (1994) in an unnamed east-flowing tributary to Nome River. The creek is in section 17, T. 10 S., R. 33 W., Kateel River Meridian. The tailings are at an elevation of about 300 feet. The location is accurate within about 1,000 feet.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Placer mine tailings at a former mine site were mapped by Bundtzen and others (1994) in an unnamed east-flowing tributary of Nome River. Bedrock near the mine site is the chlorite rich metaturbidite schist and marble unit of Bundtzen and others (1994). The mine site is about one-half mile west of the Anvil Creek fault.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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:

This placer mine was worked by surface open-cut operations.

Production notes:

Reserves:

Additional comments:

This small mine apparently is just above the Seward Ditch, and just below an unnamed ditch.

References:

Bundtzen and others, 1994.

Primary reference: Bundtzen and others, 1994

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Banner Creek**Site type:** Mine**ARDF no.:** NM282**Latitude:** 64.6483**Quadrangle:** NM C-1**Longitude:** 165.3169**Location description and accuracy:**

This alluvial placer gold mine is on Banner Creek, a west tributary to Nome River opposite Sparkle Creek (NM302). The mouth of Banner Creek is 1.1 miles south of the Nome-Taylor road crossing of Nome River. Placer mine workings are present along at least a half mile of the central part of Banner Creek, between surface elevations of 150 and 250 feet. The map location is at the approximate midpoint of the placer workings, south of the center of section 5, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 113 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Gold was discovered on Banner Creek by 1900 (Brooks and others, 1901), and some placer mining took place by 1905 (Moffit, 1913). Placer tailings from more recent mechanical mining are along about 1,000 feet of the creek on a north-side bench below the mouth of Slate Creek. Bedrock in the area is graphitic schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Sainsbury, Hummel and Hudson, 1972 [OFR 72-326]; Till and Dumoulin, 1994). Bundtzen and others (1994) do not show bedrock along Banner Creek; their nearest mapped unit is the metaturbidite schist. Moffit (1913, p. 99) reported abundant marble (limestone) intercalated with schist in the canyon above the placer cut. Gold-bearing quartz veins also have been reported at the site (Moffit, 1913, p. 132).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer tailings, probably from dozer and sluice operations, are along about 1,000 feet of Banner Creek on a north-side bench below the mouth of Slate Creek.

Production notes:**Reserves:****Additional comments:****References:**

Brooks and others, 1901; Moffit, 1913; Hummel, 1962 (MF 247); Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Grouse Gulch**Site type:** Mine**ARDF no.:** NM283**Latitude:** 64.5826**Quadrangle:** NM C-1**Longitude:** 165.3336**Location description and accuracy:**

This alluvial gold placer mine is on Grouse Gulch, a small north tributary to Dexter Creek (NM303). The map location is at an elevation of about 400 feet in the NE1/4 section 31, T. 10 S., R. 33 W., Kateel River Meridian. Grouse Gulch is included in locality 118 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Grouse Gulch heads on the divide between Dexter Creek (NM303) and upper Anvil Creek (NM236). It is one of several small headwater tributaries of Dexter Creek that head in areas where high-level auriferous gravels have been mined (for example, NM246). Placer gold mining in these tributaries took place before 1908, and some of the deposits were very rich; a 3-ounce nugget was recovered from Grouse Gulch (Brooks and others, 1901; Collier and others, 1908). Much of the placer gold in the headwaters of Dexter Creek, including the gold in Grouse Gulch, is probably derived from reworking the high-level gravels.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Small-scale placer mining, probably open-cut and hydraulic operations, took place in Grouse Gulch.

Production notes:

Reserves:

Additional comments:

References:

Brooks, Richardson, and Collier, 1901; Collier and others, 1908; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Hazel Creek (Flambeau River)**Site type:** Mine**ARDF no.:** NM284**Latitude:** 64.7062**Quadrangle:** NM C-1**Longitude:** 165.1056**Location description and accuracy:**

This alluvial gold placer mine is on Hazel Creek, a small west tributary to Flambeau River. Flambeau River is the next major drainage east of Nome River. Some small-scale placer mining took place on lower Hazel Creek where it enters the valley of Flambeau River. The map location is at an elevation of about 300 feet in the SE1/4 section 17, T. 9 S., R. 32 W., Kateel River Meridian. The location is probably accurate within one-quarter mile; it is locality 144 of Cobb (197 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Some small-scale placer gold mining took place in about 1905 on lower Hazel Creek where it enters the valley of Flambeau River (Moffit, 1913, p. 101). The eastward extension of the Anvil Creek fault is projected through Hazel Creek near this location (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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 small-scale surface placer mining, including hydraulic operations, appears to have taken place at this site.

Production notes:

Reserves:

Additional comments:

References:

Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Submarine Beach**Site type:** Mine**ARDF no.:** NM285**Latitude:** 64.5118**Quadrangle:** NM C-1**Longitude:** 165.4685**Location description and accuracy:**

Submarine Beach is a composite abrasion-platform gold deposit that can be traced from Dry Creek at Nome west as far as Jess Creek (a minor drainage about a mile east of the mouth of Penny River). It is richest and best developed west of Nome near the Nome airport. The map location in the northeast corner of section 28, T. 11 S., R. 34 W., Kateel River Meridian, represents the general area between two composite elements, the so-called Inner and Outer Submarine Beaches. The Inner Beach is one-quarter to one-half mile inland from the modern beach and is about 20 feet below sea level. The Outer Beach is 300 to 1,000 feet inland from the modern beach and is at an elevation of about 35 feet below sea level. Submarine Beach is locality 139 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Ag, Au**Other:** Cu, W**Ore minerals:** Arsenopyrite, chalcopyrite, gold, ilmenite, magnetite, pyrite, scheelite**Gangue minerals:** Garnet**Geologic description:**

Submarine Beach is the oldest recognized placer deposit that developed on the abrasion platform of the Third Beach strandline. It is irregular, but has a crudely linear trend from near the mouth of Dry Creek at Nome west as far as Jess Creek in the Nome C-2 quadrangle. Average elevations on the Inner and Outer elements of the beach are below sea level, at about -20 and -35 feet respectively, but the range of elevations is between about -10 and -40 feet (Metcalf and Tuck, 1942, p. 36). Near Nome, the deposit is on silt false bedrock. Near its western recognized limit at Jess Creek, Submarine Beach is on schistose bedrock. In the area west of Nome, where the deposit has been dredged, the overall configuration suggests a fan-like placer gold deposit that could have accumulated at the mouth of an ancestral Anvil Creek. According to Metcalf and Tuck (1942, p. 36), 'The wide distribution of gold in general indicates that it may have been the result of an old beachline that was higher than the sea that destroyed it.'

In common with the other abrasion so called beaches, such as Center Creek (NM286), Intermediate (NM287), and Monroeville (NM257), sulfides are abundant in the placer concentrates, along with some scheelite. The sulfide minerals are principally arsenopyrite, chalcopyrite, and pyrite. Chalcopyrite was especially abundant in the 'Outer' beach (Moffit, 1913, p. 119). Garnet occurs, but it does not form the ruby sand lenses that typify the true strandline beaches, such as Present (NM254), Second (NM256), and Third (NM258). The sulfide minerals probably contain gold. In 1939, samples of the Submarine Beach deposit contained 1.059 pounds of sulfide per cubic yard in the interval above bedrock, and cleaned sulfide concentrate contained 14.10 dollars worth of gold per ton of concentrates. Although the sulfides were cleaned by panning and amalgamation, some of the gold probably is still present as very fine grained free gold. The placer gold of Submarine Beach was relatively coarse compared with other beach or abrasion deposits; numerous nuggets weighed as much as 0.5 ounce (Moffit, 1913, p. 118).

The Submarine beaches were discovered in 1907 and were developed by shafts about 70 feet deep. One shaft in the 'Inner' beach bottomed at an elevation of about -20 feet (Smith, 1909, p. 271-273; Moffit, 1913, p. 118-119). The deposit consisted of alternating layers of sand and gravel, gravel predominating at depth. The gravel consisted mainly of 'slate' (their term), greenstone, schist, feldspathic schist, and limestone (marble). It also contained boulders of granite and quartz of as much as 2 feet across. The quartz boulders were semi-angular but with apparently water-rounded corners. Sand layers in the beach also contained mollusk shells, more broken, hence inferred to be older, than the shells in Intermediate Beach.

The Submarine Beach deposits were mined from about 1908 into the 1990s. One large bucket-line dredge operated on Submarine Beach from about 1975 until 1995.

Alteration:**Age of mineralization:**

Late Tertiary to Pleistocene. Fossils in the Submarine deposits were reported as late Miocene or Pliocene (Moffit, 1913, p. 45-48). Hopkins, MacNeil, and Leopold (1960) postulate that Submarine Beach could be as old as Pliocene.

Deposit model:

Marine placer gold deposit; intergrading marine abrasion and fan-like deposits reworked by offshore currents (Cox and Singer, 1986; model 39).

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

39

Production Status: Yes; small

Site Status: Active

Workings/exploration:

Submarine Beach was discovered in 1907 and was at first worked from underground drift mines in frozen ground. After the development of cold-water thawing in the 1920's,

the deposit was worked by bucket-line dredges that mined the thaw-fields after one or two years of thawing. The Submarine Beach was reopened after gold was allowed to seek a free-market price (Kastelic, 1975). The mine was shut down in 1995, when thawing and other operating costs exceeded the value of the ground, which is on the order of 0.01 to 0.015 ounce of gold per cubic yard of mining section (Bundtzen and others, 1995). High-resolution seismic surveys and drilling related to the development of the offshore gold resource have contributed to the knowledge of the Submarine Beaches (Nelson and Hopkins, 1972; Tagg and Greene, 1973).

Production notes:**Reserves:**

The Submarine Beach mine area contains a gold resource that could be mined under favorable economic conditions.

Additional comments:**References:**

Smith, 1909 (B 379); Moffit, 1913; Metcalfe and Tuck, 1942; Hopkins and others, 1960; Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Tagg and Greene, 1973; Kastelic, 1975; Cobb, 1978 (OFR 78-93); Bundtzen and others, 1995.

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Center Creek Beach**Site type:** Mine**ARDF no.:** NM286**Latitude:** 64.5137**Quadrangle:** NM C-1**Longitude:** 165.4149**Location description and accuracy:**

Center Creek Beach is an irregular, buried, east-west gold placer deposit at elevations ranging from 10 feet above to 10 feet below sea level. It appears to extend as far west as Little Creek and as far east as Peluk Creek and is about half way between Submarine and Intermediate Beaches. The map location is at the south-central edge of section 23, T. 11 S., R. 34 W., Kateel River Meridian; it is located within about 1,000 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, ilmenite, magnetite, pyrite**Gangue minerals:** Garnet**Geologic description:**

The Center Creek Beach deposit is a rather diffuse, east-west aligned, marine concentration of placer gold about half way from the mouth of Center Creek to Intermediate Beach. The deposit extends along the coastal plain between Little Creek and Peluk Creek (Metcalf and Tuck, 1942, p. 36). The deposit is developed on schist bedrock, and it is at elevations of -10 to +10 feet relative to sea level. It probably is an eroded beachline lowered by abrasion of the marine platform. The part of the deposit immediately east of the north-south runway at Nome airport was dredged. The deposit was subsequently developed in 1995-98 by an open-cut operations. It was mined during the winter, and the gravel was washed in the summer. Bedrock exposed in the pit is micaceous schist that locally contains some quartz-ankerite-albite veins.

Alteration:**Age of mineralization:**

Pliocene or Pleistocene.

Deposit model:

Marine gold placer deposit; abraded beachline deposit (Cox and Singer, 1986; model 39).

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

39

Production Status: Yes

Site Status: Active?

Workings/exploration:

The deposit was last mined by an open-pit operation.

Production notes:

Reserves:

Additional comments:

References:

Metcalf and Tuck, 1942.

Primary reference: Metcalf and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Intermediate Beach; Clam Shell Beach**Site type:** Mine**ARDF no.:** NM287**Latitude:** 64.5213**Quadrangle:** NM C-1**Longitude:** 165.3919**Location description and accuracy:**

Intermediate Beach is a buried marine placer gold deposit on the Nome coastal plain about 1.5 miles inland from the modern beach at Nome. It is in an area where surface elevations are about 100 feet, and it extends, probably discontinuously, from west of Bourbon Creek about 3 miles southeast to Otter Creek. It was extensively placer mined over a half mile section northwest of Bourbon Creek. The map location is the approximate midpoint of this half mile section, in the west-central part of section 24, T. 10 S., R. 34 W., Kateel River Meridian. Intermediate Beach is locality 143 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, gold, ilmenite, magnetite, pyrite**Gangue minerals:** Garnet**Geologic description:**

Intermediate Beach is a buried marine abrasion platform placer deposit as much as several hundred feet wide. The gravel is 6 to 12 feet thick, with 1-3 feet of pay gravel on bedrock. The elevation of the deposit is about 20 feet above sea level. Depth of burial is about 20 to 60 feet (Moffit, 1913; Nelson and Hopkins, 1972).

The deposit terminates abruptly to the west. It appears to diminish in grade to the east at about Bourbon Creek, but it may continue eastward as a low-grade deposit through the head of Peluk Creek and lower parts of Otter and Florence Creeks (Metcalf and Tuck, 1942, p. 36). The pay gravel contained abundant fragments of graphitic schist; locally, clam shells were so abundant that it was called the Clam Shell beach (Moffit, 1913, p. 118). The clams (mollusks) included species now living off Japan and some that only live south of present winter ice in the Bering Sea. Dall concluded that the climate in Intermediate Beach time was warmer than now at Nome (Dall, in Moffit, 1913, p. 45). Intermediate Beach appears to have formed when marine currents lowered an auriferous platform during a Pleistocene transgression that formed Third Beach.

Intermediate Beach was discovered in the winter of 1905-1906 (Smith, 1908; Moffit, 1913). The deposit was dredged extensively between Center and Bourbon Creeks after the development of cold-water thawing. (Center Creek is not named on the 1970 edition of the topographic map but is probably the drainage paralleling the northeast runway of the Nome airport.)

Alteration:**Age of mineralization:****Deposit model:**

Marine gold placer deposit; marine abrasion platform concentration (Cox and Singer, 1986; model 39).

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

39

Production Status: Yes**Site Status:** Inactive**Workings/exploration:**

The deposit was drift mined after 1906. After the development of cold-water thawing in the 1920's, it was dredged, especially between Bourbon and Center Creeks.

Production notes:**Reserves:****Additional comments:****References:**

Smith, 1908; Moffit, 1913; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Nelson and Hopkins, 1972; Cobb, 1978 (OFR 78-93).

Primary reference: Moffit, 1913**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Bourbon Creek; Holyoke Creek**Site type:** Mine**ARDF no.:** NM288**Latitude:** 64.5262**Quadrangle:** NM C-1**Longitude:** 165.3772**Location description and accuracy:**

Bourbon Creek is a stream on the Nome coastal plain that flows south to Snake River at Nome. Holyoke Creek is a tributary to Bourbon Creek. The map location is at about the midpoint of Bourbon Creek on the coastal plain. It is in the NE1/4 section 22, T. 11 S., R. 34 W., Kateel River Meridian. Bourbon Creek is locality 128 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Shallow alluvial gold deposits in Bourbon Creek and its tributary Holyoke Creek were discovered in 1900 (Brooks and others, 1901, p. 69, 83-84) and mining began soon afterward. Total production in 1900 was about 5,000 dollars (approximately 250 ounces of gold). Total production to 1903 on both Bourbon and Holyoke Creeks was about 100,000 dollars or 5,000 ounces of gold (Collier and others, 1908, p. 167). This production was entirely from shallow deposits derived by reworking gravel of the coastal plain. The trench occupied by Bourbon Creek was about 15 feet deep and about 500 feet wide; pay was shallow; Collier and others cite two sections, one about 6 feet deep, the second about 10 feet. Gradient of the creek was low, and only a few of the deposits were rich enough to work by shovel-in methods; one successful placer mine averaged 4 dollars per cubic yard. Early attempts at dredging the shallow ground failed because of inadequate dredges. Later attempts at dredging were stopped because much of the ground was frozen. By about 1906, drilling and shafts showed that Bourbon and Holyoke Creeks concealed local valuable paystreaks that had formed during marine transgression toward Third Beach. Depths to bedrock ranged from about of 17 to 120 feet.

Alteration:

Age of mineralization:**Deposit model:**

Shallow alluvial placer gold deposits formed by reworking low-grade gravel deposits of the coastal plain along Bourbon and Holyoke Creeks (Moffit, 1913; Metcalfe and Tuck, 1942) (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:

The deposits were discovered in 1900. About 5,000 ounces of gold had been mined from shallow alluvial deposits by the end of 1903 (Collier and others, 1908). By 1906, drilling and shafts had been extensive enough to delineate buried marine deposits near the base of the coastal plain section.

Production notes:**Reserves:****Additional comments:****References:**

Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Metcalfe and Tuck, 1942.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (lode south of hill 1190 between Snake and Nome Rivers)

Site type: Occurrence

ARDF no.: NM289

Latitude: 64.6733

Quadrangle: NM C-1

Longitude: 165.3498

Location description and accuracy:

This unnamed lode occurrence is at an elevation of about 1,100 feet on the ridge crest between the Nome and Snake River drainages. The map location is 2.1 miles north-northwest of the Nome-Taylor road crossing of Nome River, just inside the south-central border of section 30, T. 9 S., R. 33 W., Kateel River Meridian. This is locality 23 of Hummel (1962 [MF 247]) and 39 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Cu

Other:

Ore minerals: Chalcopyrite (?), malachite (?)

Gangue minerals:

Geologic description:

Hummel (1962 [MF 247, locality 23]) reports a copper prospect at this site. Bedrock is graphitic schist; no other information is available.

Alteration:

Oxidation?

Age of mineralization:

Deposit model:

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Some surface prospecting pits may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962, MF 247

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Holmason and Helde**Site type:** Prospect**ARDF no.:** NM290**Latitude:** 64.7254**Quadrangle:** NM C-1**Longitude:** 165.3584**Location description and accuracy:**

The Holmason and Helde lode prospect is at an elevation of about 350 feet in the headwaters of an unnamed east tributary to Goldbottom Creek. It is 0.8 mile due east of the Snake River road, in the NW1/4 section 7, T. 9 S., R. 33 W., Kateel River Meridian. This is locality 6 of Hummel (1962 [MF 247]) and 34 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Cu**Other:****Ore minerals:** Chalcopyrite (?), pyrite (?)**Gangue minerals:****Geologic description:**

Hummel (1962 [MF 247, locality 6]) reported copper and iron sulfides at this site. The deposit is near the contact between graphitic mica schist and graphitic quartz schist (mapping by Kennecott Exploration Co., 1994-5). Some marble occurs in the graphitic mica schist unit. No other information about the prospect is available.

Alteration:

Oxidation?

Age of mineralization:**Deposit model:****Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):****Production Status:** None**Site Status:** Inactive

Workings/exploration:

Some surface prospecting pits may be present.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Hummel, 1962 (MF 247)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nelson (Skookum Creek)**Site type:** Prospect**ARDF no.:** NM291**Latitude:** 64.6727**Quadrangle:** NM C-1**Longitude:** 165.2188**Location description and accuracy:**

The Nelson lode prospect is at an elevation of about 1,550 feet in the uppermost headwaters of Skookum Creek, a headwater tributary to Bonita Creek (NM280). It is locality 11 of Hummel (1962 [MF 247]) and locality 40 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The map location is just inside the south-central edge of section 26, T. 9 S., R. 33 W., Kateel River Meridian; it is probably located to within a quarter mile.

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Stibnite**Gangue minerals:****Geologic description:**

Auriferous lenses and kidneys of nearly pure stibnite were reported at this prospect (Smith, 1908). The deposit was explored by a 15-foot-deep shaft (Mertie, 1918 [B 662-I, p. 425-449]). Bedrock in this area was mapped as marble, schist, and metabasite sills (Bundtzen and others, 1994).

Alteration:**Age of mineralization:****Deposit model:**

Simple Sb deposits (Cox and Singer, 1986; model 27d).

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

27d

Production Status: No

Site Status: Inactive

Workings/exploration:

The prospect was explored by a 15-foot-deep shaft (Mertie, 1918 [B 662-I, p. 425-449]).

Production notes:

Reserves:

Additional comments:

References:

Smith, 1908; Mertie, 1918 (B 662-I); Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Bundtzen and others, 1994.

Primary reference: Smith, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Unnamed (lode occurrence in upper Lillian Creek)

Site type: Prospect

ARDF no.: NM292

Latitude: 64.6281

Quadrangle: NM C-1

Longitude: 165.2355

Location description and accuracy:

This unnamed lode prospect is at an elevation of about 400 feet in the headwaters of Lillian Creek (NM279). The map location is about 0.6 mile southwest of elevation 857 at the northeast corner of section 15, T. 9 S., R. 33 W., Kateel River Meridian. It is locality 21 of Hummel (1962 [MF 247]) and is probably located to within one-quarter mile.

Commodities:

Main: Au (?)

Other:

Ore minerals: Arsenopyrite, pyrite, pyrrhotite (?)

Gangue minerals:

Geologic description:

This prospect consists of arsenopyrite, pyrite, and possibly pyrrhotite in calcareous schist and marble; no other information is available (Hummel, 1962 [MF 247]). The deposit, herein inferred to be auriferous, has been explored by a few pits. A placer gold deposit is in Lillian Creek (NM279).

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:

Prospect pits.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 247).

Primary reference: Hummel, 1962 (MF 247)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Rex (Anvil Mountain)

Site type: Prospect

ARDF no.: NM293

Latitude: 64.5558

Quadrangle: NM C-1

Longitude: 165.3467

Location description and accuracy:

This Rex lode prospect is at an elevation of about 550 feet on the southeast flank of Anvil Mountain, several hundred feet west of and above Dry Creek. The map location is just inside the north-central edge of section 7, T. 11 S., R. 33 W., Kateel River Meridian. It is locality 52 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au (?)

Other:

Ore minerals: Gold (?)

Gangue minerals: Calcite

Geologic description:

Cathcart (1922) reported several tunnels driven on calcite veins less than a foot thick in marble at this prospect. Although Cathcart did not observe quartz or sulfides, the owner reported that assays from one vein ran 0.15 to 0.2 ounce of gold per ton.

Alteration:

Age of mineralization:

Mid-Cretaceous or younger; veins cross cut marble metamorphosed in the mid-Cretaceous.

Deposit model:

Calcite veins in marble.

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

Production Status: None

Site Status: Inactive

Workings/exploration:

Several tunnels, 25 to 180 feet long, were driven on this deposit.

Production notes:

Reserves:

Additional comments:

References:

Cathcart, 1922.

Primary reference: Cathcart, 1922

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Center Creek and Flat, Saturday and Wonder Creeks**Site type:** Occurrence**ARDF no.:** NM294**Latitude:** 64.5338**Quadrangle:** NM C-1**Longitude:** 165.3954**Location description and accuracy:**

Locations on Center Creek are confused because Flat Creek and Saturday Creek were in the upper part of Center Creek and Wonder Creek was the middle part of Center Creek. The creek segments and tributaries are now difficult to locate because of extensive mining (NM251). (These drainages probably were extensions of that paralleling the northeast runway of the Nome airport.) This site is probably within one-half mile of the location for Little Creek (NM251). These deposits were included in locality 138 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Ag, Au**Other:** W**Ore minerals:** Gold, magnetite, scheelite**Gangue minerals:** Garnet, quartz**Geologic description:**

The upper parts of Center Creek, sometimes called Saturday and Wonder Creek, were developed first as shallow placer deposits in the coastal plain. The situation is as explained by Collier and others (1908, p. 168): 'Saturday Creek is the name given to the upper part of Center Creek which flows into Snake River about a mile above Nome, and Wonder Creek is the middle part of the same stream. This diversity of names is due to the fact that under the local rules . . . one claim was allowed to one man on a creek. This rule was often circumvented by changing the name of the creek at each tributary and locating a claim with each change of the name.'

Saturday Creek was located and mined in about 1900. The deposit was shallow, with a 3-foot pay section underneath 2 or 3 feet of muck. Gold was bright, commonly had quartz attached, and was fairly coarse. One nugget of about 0.75 ounce was found. Concentrates contained garnet, magnetite, and some scheelite. Moffit (1913, p. 118-119) included Saturday, Wonder, and Flat Creeks as shallow coastal plain tributaries to Center Creek.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Shallow alluvial placer gold deposits developed in coastal plain gravels. Deep deposits were subsequently developed in the same area.

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Shallow deposits were found on segments or tributaries of Center Creek in about 1900. These deposits were exploited quickly. The area was extensively mined and surface drainage changed after discovery of Third Beach near Little Creek.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Specimen Gulch**Site type:** Mines**ARDF no.:** NM295**Latitude:** 64.5764**Quadrangle:** NM C-1**Longitude:** 165.3800**Location description and accuracy:**

Specimen Gulch is a southwest-flowing seasonal tributary of Anvil Creek. It is below the high-level or bench deposits of the Summit claim (NM247). The map location is at an elevation of about 350 feet at about the midpoint of Specimen Gulch in the south-central part of section 36, T. 10 S., R. 34 W., Kateel River Meridian. The location is locality 48 of Cobb (1972 [MF 463]); it is accurate to within about 500 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:** Quartz**Geologic description:**

Specimen Gulch heads in the high-bench gravels near the Summit claim (NM247); it also crosses a major east-side bench of Anvil Creek. Both the Summit and Anvil Creek bench placers contributed gold to the shallow deposits in Specimen Gulch (Collier and others, 1908, p. 191; Moffit, 1913, p. 84). In Specimen Gulch, gold occurred throughout an 8-foot section beneath a 1-foot muck layer. The gold was bright, coarse and not well waterworn (Collier and others, 1908, p. 191). In lower Specimen Gulch, bedrock is mainly graphitic schist, possibly between strands of the Anvil Creek fault (Hummel, 1962 [MF 247]). Upper Specimen Gulch is underlain by orthogneiss and metavolcanic schist (Bundtzen and others, 1994). The area has been mined repeatedly from 1899 until the present.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes

Site Status: Active

Workings/exploration:

Extensive surface workings. The area has been mined since 1899.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Otter Creek; Florence Gulch**Site type:** Mine**ARDF no.:** NM296**Latitude:** 64.4940**Quadrangle:** NM B-1**Longitude:** 165.2938**Location description and accuracy:**

Otter Creek is the first west tributary to Nome River upstream from its mouth on Norton Sound. About 3,500 feet of lower Otter Creek and the lower 1,000 feet of Florence Gulch, an east tributary to Otter Creek, have been placer mined. This placer mining is at elevations of less than 25 feet; its downstream limit is about at the projected Second Beach crossing of the Nome River drainage. The map location is on Otter Creek just below the mouth of Florence Gulch, in the NW1/4 section 33, T. 11 S., R. 33 W., Kateel River Meridian. It is locality 124 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining, including dredging at least in 1913 (Chapin, 1914), took place along lower Otter Creek. Otter Creek reworks coastal plain deposits.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer tailings are present along lower Otter Creek.

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1914; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Peluk Creek**Site type:** Mine**ARDF no.:** NM297**Latitude:** 64.4996**Quadrangle:** NM B-1**Longitude:** 165.3438**Location description and accuracy:**

The mouth of Peluk Creek is on Norton Sound about 1.5 miles southeast of Nome. This location is at an elevation of about 50 feet and upstream of the projected Second Beach crossing of Peluk Creek. The map location is at the north-central boundary of section 31, T. 11 S., R. 33 W., Kateel River Meridian. It is locality 140 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining has taken place in at least two locations on Peluk Creek. Near the head of the creek, at a surface elevation of about 100 feet in the Nome C-1 quadrangle, mining produced about 100 ounces of coarse, rough, and iron-stained gold from 4 feet of angular gravel pay on a 4-foot-thick clay false bedrock (Collier and others, 1908). Schist bedrock was 72 to 82 feet deep in this area (30 feet above sea level), and the lower 40 feet of the gravel contained 0.1 to 0.4 ounce of gold per cubic yard. Elsewhere on Peluk Creek, non-float placer mining took place as recently as 1940 (Smith, 1942). This mining may have been lower on the creek where it reworks coastal plain deposits such as Second Beach (NM256).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:** Probably inactive**Workings/exploration:**

Placer gold tailings are locally present on Peluk Creek.

Production notes:**Reserves:****Additional comments:****References:**

Collier and others, 1908; Smith, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Collier and others, 1908**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Hastings Creek**Site type:** Mine**ARDF no.:** NM298**Latitude:** 64.4744**Quadrangle:** NM B-1**Longitude:** 165.0961**Location description and accuracy:**

The mouth of Hastings Creek is on Norton Sound about 9.5 miles southeast of Nome. The confluence of Saunders and Hastings Creeks is about 5,000 feet upstream of the Nome-Council road crossing of Saunders Creek. About 1.5 miles of lower Hastings Creek has, at least locally, been placer mined for gold. The map location is the approximate midpoint of the placer workings, in the SW1/4 section 4, T. 12 S., R. 32 W., Kateel River Meridian. It is included in locality 133 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

About 1.5 miles of lower Hastings Creek has, at least locally, been placer mined for gold. Mining included dredging in 1916-18 and 1930 (Cobb, 1978, OFR 78-93). Some of this mining was near or on Second Beach (NM256), as well as farther inland (Collier and others, 1908; Moffit, 1913). Most of the creek flows across older parts of the Nome coastal plain, including the projected trace of Third Beach (NM258).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer gold tailings are locally present on Hastings Creek.

Production notes:

Reserves:

Additional comments:

References:

Collier and others, 1908; Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Cape Nome

Site type: Occurrence

ARDF no.: NM299

Latitude: 64.4371

Quadrangle: NM B-1

Longitude: 165.0073

Location description and accuracy:

Cape Nome is on the coast of Norton Sound 12.5 miles southeast of Nome. The map location is at an elevation of about 250 feet on the north side of the Nome-Council road, in section 23, T. 12 S., R. 32 W., Kateel River Meridian. This is locality 55 of Cobb (1972 [MF 463], 1978 [OFR 78-93]); the location is probably accurate to within 1 mile.

Commodities:

Main:

Other: Au, Cr, F, W

Ore minerals: Chromite, fluorite, goethite, gold, scheelite

Gangue minerals: Biotite, chlorite, garnet, muscovite, sericite, sphene

Geologic description:

Bedrock at Cape Nome is mostly granitic orthogneiss (Sainsbury, Hummel, and Hudson, 1972 [OFR 72-326]). In an investigation of the orthogneiss for radioactive minerals, heavy mineral analysis revealed trace amounts of chromite (one location), fluorite, and possibly scheelite (White and others, 1953). Gold, claims have been located in the Cape Nome area (Kardex site Kx 286, Heiner and Porter, 1972). The orthogneiss reportedly is late Precambrian in age (Patrick and McClelland, 1995).

Alteration:

Age of mineralization:

Patrick and McClelland (1995) report a uranium/lead age for the orthogneiss at Cape Nome of 676 +/- 15 million years.

Deposit model:

Accessory minerals in Precambrian orthogneiss.

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Quarries for road construction materials are present in the Cape Nome area.

Production notes:

Reserves:

Additional comments:

Cape Nome is an important locale for heavy riprap; riprap may be hauled on trucks or loaded on barges at the base of the cliff.

References:

White and others, 1953; Sainsbury, Hummel, and Hudson, 1972 (OFR 72-326); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Patrick and McClelland, 1995.

Primary reference: White and others, 1953

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Irene Creek; Topaz**Site type:** Mine**ARDF no.:** NM300**Latitude:** 64.4880**Quadrangle:** NM B-1**Longitude:** 165.2040**Location description and accuracy:**

Irene Creek is the first east tributary to Nome River upstream from its mouth on Norton Sound. The map location is in the SE1/4 section 35, T. 11 S., R. 33 W., Kateel River Meridian. This location is about 4,000 feet due north of the Nome-Council road and 2.5 miles east-northeast of the Nome-Council road crossing of Nome River. It is locality 123 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and is probably accurate to within one-half mile.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold mining has occurred locally on Irene Creek dating back to a least 1916 (Mertie, 1918 [B 662-I, p. 425-449]). Most of Irene Creek flows across older parts of the Nome coastal plain, including the eastern trace of Third Beach (NM258).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer gold tailings are locally present on Irene Creek.

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1918 (B 622-I); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Basin Creek**Site type:** Mine**ARDF no.:** NM301**Latitude:** 64.6821**Quadrangle:** NM C-1**Longitude:** 165.2838**Location description and accuracy:**

This alluvial placer gold mine is on Basin Creek, an east tributary to Nome River. About 7,000 to 8,000 feet of Basin Creek, between elevations of 150 and 350 feet, have been placer mined. The map location is 0.6 mile upstream of the mouth of Basin Creek, about where it enters the Nome River floodplain, in the NW1/4 section 28, T. 9 S., R. 33 W., Kateel River Meridian. It is locality 112 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location is accurate to within about 500 feet.

Commodities:**Main:** Au, W**Other:****Ore minerals:** Gold, hematite, ilmenite, scheelite**Gangue minerals:****Geologic description:**

Gold was discovered on Basin Creek by 1900 (Brooks and others, 1901). At least 1 mile of the creek has been extensively placer mined, much by a small floating dredge. The partly crystalline gold was in a 150-foot-wide paystreak consisting of coarse gravels on bedrock and in crevices in bedrock. From top to bottom, the unconsolidated section included 2 feet of soil, 3 feet of rounded gravel, 12 feet of coarse, angular gravel containing more than 30 percent clasts greater than 10 inches in diameter, clay on bedrock, and 0.5 to 1.5 feet of fractured bedrock (Collier and others, 1908). Heavy mineral concentrates contained ilmenite, hematite, and scheelite. Coats (1944) later reported that the amount of placer scheelite in Basin Creek was negligible. The gold was approximately 900 fine (Purinton, 1905). This mine continued to be active, at least for the purposes of tourist visits, at least until the 1970's. Bedrock is mainly marble, probably of Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1994). Bundtzen and others (1994) determined that albite-bearing mafic schist was in thrust contact with the marble about at the head of the paystreak in Basin Creek.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Active

Workings/exploration:

Extensive placer mine tailings are present along about 1 mile of Basin Creek upstream from the Nome River floodplain. Road construction materials have also been mined from the patented claims in Basin Creek. Mining since about 1960 has been mainly by a bucket line dredge with about 1.5-cubic-foot buckets. This dredge was constructed, and has been operated, by the Engstrom family.

Production notes:

Production until about 1906 was about 1,450 ounces of gold (Moffit, 1913). Total production until 1996 is believed to be less than 20,000 ounces.

Reserves:**Additional comments:**

Basin Creek has been one of the most productive creeks on the east side of the Nome River in the Nome district.

References:

Brooks and others, 1901; Purington, 1905; Collier and others, 1908; Moffit, 1913; Coats, 1944; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Sparkle Creek**Site type:** Mine**ARDF no.:** NM302**Latitude:** 64.6446**Quadrangle:** NM C-1**Longitude:** 165.2727**Location description and accuracy:**

Sparkle Creek is a small east tributary to Nome River. The mouth of Sparkle Creek is 0.8 mile southeast of the Nome-Taylor road crossing of Nome River. The placer mine probably was on the floodplain of Nome River opposite Sparkle Creek. The map location is in the SE1/4 section 4, T. 10 S., R. 33 W., Kateel River Meridian. The location is accurate within a quarter of a mile.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Sparkle Creek appears to be an artificial drainage below two high-level ditches (see Nome C-1 quadrangle, sections 3, 10, 11, 13, 14). Bundtzen and others (1994) mapped placer tailings on the floodplain of the Nome River opposite Sparkle Creek, suggesting the possibility that Sparkle Creek was the cut that brought hydraulic water to the floodplain. However Kardex locations (Kardex sites Kx 164 and 316a, Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982) are on Sparkle Creek. The name Sparkle Creek was reported as a prospector's name in 1900 (Orth, 1967).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

A placer mine related to Sparkle Creek apparently was on the floodplain of Nome River opposite Sparkle Creek. Substantial tailings are on the floodplain at this site.

Production notes:

Reserves:

Additional comments:

References:

Orth, 1967; Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982; Bundtzen and others, 1994.

Primary reference: Bundtzen and others, 1994

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Dexter Creek**Site type:** Mine**ARDF no.:** NM303**Latitude:** 64.5817**Quadrangle:** NM**Longitude:** 165.2920**Location description and accuracy:**

This alluvial placer gold mine is on Dexter Creek, a west tributary to Nome River. Placer mining took place over at least 7,500 feet of Dexter Creek between elevations of 50 and 250 feet. The map location is in the NW1/4 section 33, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 118 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Ag, Au**Other:** Sn**Ore minerals:** Cassiterite, gold**Gangue minerals:****Geologic description:**

Placer gold mining was underway on Dexter Creek by 1899. About 14,500 ounces of gold were produced in 1900 (Schrader and Brooks, 1900; Brooks and others, 1901). Most of Dexter Creek has been worked from its mouth to its headwater tributaries (Collier and others, 1908). Bench deposits at elevations 75 feet above the creek were worked at a few locations on the north side of the creek valley. One such is 1 mile above the mouth and 100 yards above the mouth of Grouse Gulch. Near the mouth of Dexter Creek, pay was on a blue clay false bedrock 5 feet below the surface. Upstream, 3 to 10 feet of stream gravels are on schist and marble bedrock, and pay continued downward into decomposed or fractured bedrock. Solution-enlarged fractures in marble were locally very rich and extended as much as 30 feet below the base of the gravels; karst features in bedrock probably contributed to water loss that commonly hindered mining operations on Dexter Creek (Moffit, 1913). The bench gravels were as much as 30 feet thick. The bench deposit 100 yards above the mouth of Grouse Gulch contained 5 feet of yellow clay over 15 feet of poorly sorted schist, marble, granite, and sandy clay gravels. The low elevations of the creek, from less than 50 feet to 250 feet, and proximity to the lower Nome River valley and coastal plain suggest that Quaternary sea-level fluctuations could have influenced development of some of the lower Dexter Creek placers, although most of the gold ultimately came from high-bench placer deposits. The upper south tributary to Dex-

ter Creek is Wet Gulch, which taps the high-bench gravel between North Newton Peak and Anvil Mountain (NM248). Other headward tributaries include Grouse Gulch and Deer Gulch, which tap the Dexter high-bench (NM246), and Grass Gulch (NM266), which taps the Summit high-bench (NM247).

Bedrock in Dexter Creek is marble and schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1994). Bundtzen and others (1994) classified bedrock on the uplands above Dexter Creek as porphyroclastic micaceous graphitic schist.

The completion of the Miocene Ditch to Dexter in 1903 allowed parts of the creek to be worked hydraulically, although drift mines were in operation as late as the winter of 1912-13 (Chapin, 1914). A dredge was installed in about 1918 and operated at least until 1926 (Cathcart, 1920; Smith, 1932).

Cassiterite was reported from one locality (Cobb, 1973 [B 1374]). Gold on Dexter Creek ranged in size from dust to large nuggets; gold was approximately 900 fine (Purinton, 1905).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Dexter Creek has been extensively placer mined from its mouth to its headwater tributaries. All types of surface placer mining operations have taken place, from hand operations to dredging. Dredging was the principal mining operation from 1918 to 1926 (Cobb, 1978 [OFR 78-93]).

Production notes:

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Brooks and others, 1901; Purinton, 1905; Collier and others, 1908; Moffit, 1913; Chapin, 1914; Cathcart, 1920; Smith, 1932; Hummel, 1962 (MF

247); Cobb, 1972 (MF 463); Cobb, 1973 (B 1374); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Buster Creek**Site type:** Mine**ARDF no.:** NM304**Latitude:** 64.5923**Quadrangle:** NM C-1**Longitude:** 165.2458**Location description and accuracy:**

This alluvial placer gold mine is on Buster Creek, an east tributary to Nome River, directly across the Nome River valley from Dexter Creek (NM303). The map location is near where Buster Creek enters the Nome River floodplain, at the center of section 27, T. 10 S., R. 33 W., Kateel River Meridian. Buster Creek was mined for about 3 miles above the map location. It is locality 116 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Gold was discovered on Buster Creek by 1900 (Schrader and Brooks, 1900 and Brooks and others, 1901). Mining took place intermittently until 1918 and again as recently as 1954 and 1955 when a small dredge was in operation (Hummel, 1975; Cobb, 1978 [OFR 78-93]). Buster Creek was auriferous from the floodplain of Nome River upstream at least to Goodluck Gulch. Two tributaries, Grace (NM269) and Union (NM270), were also auriferous. In the canyon above the floodplain, paystreaks had formed under the modern drainage and in bench deposits. The modern creek paystreak consisted of 3-foot-thick gravels on bedrock and 1 to 2 feet of bedrock that contained coarse gold; pay was 100 feet wide about 2 miles above the mouth (Collier and others, 1908). A bench deposit opposite the mouth of Union Gulch probably continued upstream to a similar deposit in Grace Gulch. The bench deposit opposite Union Gulch was at an elevation of about 300 feet and about 100 feet higher than nearby Buster Creek. The bench channel had bedrock rims that disappeared to the west (Moffit, 1913, p. 96-97). The creek was actively mined until 1918 (Cathcart, 1920). A small dredge probably operated in 1954 on lower Basin Creek near or in the main floodplain (Hummel, 1975). Gold was reported as coarse and about 900 fine.

Bedrock in the drainage is marble and schist, probably of early Paleozoic protolith age

(Hummel, 1962 [MF 247]; Till and Dumoulin, 1984; Bundtzen and others, 1994). Buster Creek is bracketed by two NNE-striking faults. The faults are subparallel to the Anvil Creek fault about 2 1/2 miles northwest of Buster Creek.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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:

Buster Creek apparently was mined from about 1900 until at least 1918; lower Buster Creek was dredged from about 1953 to 1954.

Production notes:**Reserves:****Additional comments:****References:**

Schrader and Brooks, 1900; Brooks and others, 1901; Collier and others, 1908; Moffit, 1913; Cathcart, 1920; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Hummel, 1975; Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Collier and others, 1908

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Osborn Creek**Site type:** Mine**ARDF no.:** NM305**Latitude:** 64.5573**Quadrangle:** NM C-1**Longitude:** 165.1253**Location description and accuracy:**

This alluvial placer gold mine is on Osborn Creek, an east tributary to Nome River. More than 3.2 miles of Osborn Creek, between elevations of 75 and 150 feet, have been placer mined. This location is the approximate midpoint of the placer workings, at the south edge of the SW1/4 section 5, T. 11 S., R. 32 W., Kateel River Meridian. It is locality 120 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Placer gold was discovered on Osborn Creek in 1900. Except in an area just above St. Michaels Creek (NM277), Osborn Creek placer deposits mostly have gravel walls and paystreaks are floored by clay-rich false bedrock. Gravel was composed mostly of schist, marble, and quartz. Boulders of greenstone and granite (orthogneiss?) are abundant. Granite boulders believed by Collier to come from the Kigluaik Mountains were found as high as 800 feet on the 1,000-foot-tall mountain south of Willow Creek (Collier and others, 1908, p. 171).

Shallow placer deposits were mined for about 5 miles above the mouth of the Osborn Creek. Gravels probably contained about 2.50 to 4.50 dollars in gold (gold at 20.67 dollars per ounce; Collier and others, 1908, p. 171). Gravels were about 5 to 6 feet thick above a false bedrock in a pay section 100 feet wide. Gold was mostly coarse and well rounded, although some pieces were angular. A copper-bearing lode, reported to contain as much as 2 ounces of gold per ton (Smith, 1908), occurs above Osborn Creek (NM278), but much of the placer gold is probably reworked from coastal plain deposits.

Small-scale mining began about 1903 (Collier and others, 1908, p. 171-172) and was almost continuous up to WW II. Dredging was nearly continuous in two periods, from 1913 to 1924 and from 1928 to 1940 (Cobb, 1978 [OFR 78-93]). Larger scale mining de-

veloped by about 1911 with dredging and hydraulic mining (Smith, 1912; Chapin, 1914; Eakin, 1915 [B 622-I. p. 360-373]). The early period of dredging lasted until about 1924 (Smith, 1926). In 1928 another dredge was moved in from the Solomon River (Smith, 1930 [B 813]), and dredge mining occurred in most years at least through 1940 (Smith, 1942).

Bedrock in lower Osborn Creek is marble and schist, probably of early Paleozoic protolith age (Hummel, 1962 [MF 247]; Till and Dumoulin, 1994; Bundtzen and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Yes; medium

Site Status: Inactive

Workings/exploration:

Extensive placer tailings on Osborn Creek start about 0.2 mile downstream of the mouth of St. Michaels Creek (NM277) and continue upstream for about 3.2 miles. Most of these tailings are probably the result of dredge operations that were almost continuous between 1911 and 1940. Gold was discovered in the creek in 1900, and small-scale mining began by about 1903.

Production notes:

Although production data are not available, the continuity and extent of mining operations suggest that Osborn Creek was one of the more productive creeks in the Nome area.

Reserves:**Additional comments:****References:**

Collier and others, 1908; Smith, 1908; Smith, 1912; Moffit, 1913; Chapin, 1914; Eakin, 1915 (B 622-I); Smith, 1930 (B 813-A); Smith, 1942; Hummel, 1962 (MF 247); Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Till and Dumoulin, 1994; Bundtzen and others, 1994.

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Grass Creek (Nome B-1 quadrangle)

Site type: Mine

ARDF no.: NM306

Latitude: 64.4805

Quadrangle: NM B-1

Longitude: 165.1091

Location description and accuracy:

This alluvial placer gold mine is on Grass Creek, a small west tributary to Saunders Creek (NM307). The mouth of Grass Creek is about 1.8 miles upstream of the Nome-Council road crossing of Hastings Creek. About 3,000 feet of lower Grass Creek has been placer mined. This location is the approximate midpoint of the placer workings, in the NE1/4 section 5, T. 12 S., R. 32 W., Kateel River Meridian. It is included in locality 133 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Placer gold tailings are present along the lower 3,000 feet of Grass Creek. It was probably mined at about the same time and by the same methods as Saunders Creek (NM307), dredged in 1911-1912. Grass Creek primarily flows across older parts of the Nome coastal plain. Judged from the elevation at the head of pay (about 75 feet), the gold in Grass Gulch could be derived from Third Beach, which in this area appears to have been developed on offshore bars and lagoons (Metcalf and Tuck, 1942).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mine tailings are present along the lower 3,000 feet of this Grass Creek.

Production notes:

Reserves:

Additional comments:

References:

Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93); Metcalfe and Tuck, 1942.

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Saunders Creek**Site type:** Mine**ARDF no.:** NM307**Latitude:** 64.4713**Quadrangle:** NM B-1**Longitude:** 165.1089**Location description and accuracy:**

This alluvial placer gold mine is on Saunders Creek, a west tributary to Hastings Creek (NM298). The mouth of Saunders Creek is about three quarters of a mile upstream of the Nome-Council road crossing of Hastings Creek. Placer mining took place at elevations of 25 to 50 feet and extended for about three quarters of a mile upstream from the mouth of Saunders Creek. The map location is the approximate midpoint of the placer workings, at the south edge of section 5, T. 12 S., R. 32 W., Kateel River Meridian. It is included in locality 133 of Cobb (1972 [MF 463], 1978 [OFR 78-93]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

A dredge operated on Saunders Creek in 1911-12 and reportedly worked out the ground (Chapin, 1914). Saunders Creek flows across older parts of the eastern Nome coastal plain, including the projected trace of Third Beach (NM258) (Metcalf and Tuck, 1942).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Placer mine tailings are along about three quarters of a mile of Saunders Creek upstream from its mouth to just beyond the mouth of Grass Creek (NM306).

Production notes:

Reserves:

Additional comments:

References:

Chapin, 1914; Metcalfe and Tuck, 1942; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Metcalfe and Tuck, 1942

Reporter(s): C.C. Hawley and Travis L. Hudson

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Site name(s): Gold Run**Site type:** Prospect**ARDF no.:** NM308**Latitude:** 64.6496**Quadrangle:** NM C-1**Longitude:** 165.2142**Location description and accuracy:**

Placer mining claims have been staked on Gold Run Creek, a headwater tributary to Bonita Creek (Kardex site Kx 207; Alaska Division of Geological and Geophysical Surveys, 1982). Bonita Creek is a headwater tributary to Osborn Creek (NM305), a major east tributary to Nome River. The map location is at an elevation of about 600 feet, at the center of section 2, T 10 S, T. 10 S., R. 33 W., Kateel River Meridian. This location is probably accurate to within one-third mile.

Commodities:**Main:** Au**Other:** Sb**Ore minerals:** Gold, stibnite (?)**Gangue minerals:****Geologic description:**

Mining claims have been staked for gold and antimony on Gold Run, a headwater tributary to Bonita Creek (Kardex site Kx 207, Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). Bedrock in this area is marble and schist that is locally cut by high-angle faults, including an eastward extension of the Anvil Creek fault (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Surface prospecting has taken place; no other workings are known.

Production notes:

Reserves:

Additional comments:

References:

Hummel, 1962 (MF 247); Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: Alaska Division of Geological and Geophysical Surveys, 1982

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Willow Creek**Site type:** Prospect**ARDF no.:** NM309**Latitude:** 64.6004**Quadrangle:** NM C-1**Longitude:** 165.1389**Location description and accuracy:**

Placer mining claims have been staked on Willow Creek, a west tributary to Osborn Creek (Kardex site Kx 284, Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). The map location is at an elevation of about 300 feet in the SE1/4 section 19, T. 10 S., R. 33 W., Kateel River Meridian. This location is 1.1 mile north of elevation 1045 and probably accurate to within a third of a mile.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Mining claims have been staked on Willow Creek), a west tributary to Osborn Creek (Kardex site Kx 284, Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982). Four claims were located for placer gold in 1967 by Walter Glavinovich, and these claims were still active in 1982. The creek was prospected by mechanical equipment, including dozer. Gold is present but in amounts that were sub-economic during the 1960's and 1970's (P. Glavinovich, oral communication, 2000). The creek is probably cut in gravel walls. A rhyolite sill of Cretaceous or Tertiary age crops out on the hill slope south of the prospect (Hummel, 1962 [MF 247]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: None**Site Status:** Probably inactive**Workings/exploration:**

Surface prospecting has taken place. The claims were active at least from 1967 until 1982.

Production notes:**Reserves:****Additional comments:****References:**

Hummel, 1962 (MF 247); Heiner and Porter, 1972; Alaska Division of Geological and Geophysical Surveys, 1982.

Primary reference: This report**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Lower Snake River**Site type:** Mine**ARDF no.:** NM310**Latitude:** 64.5063**Quadrangle:** NM C-1**Longitude:** 165.4397**Location description and accuracy:**

The lower part of Snake River was placer mined, in part in conjunction with deepening the river for navigation. This is locality 131 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The location of the mine is approximate. The map location is just east of the center of section 27, T. 11 S., R. 34 W., Kateel River Meridian.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Fine gold was discovered on the bars of lower Snake River about July 28, 1898 (Schrader and Brooks, 1900). This discovery led to further prospecting in September, 1898, and to the subsequent major discoveries in Glacier Creek (NM220), Rock Creek (NM209), and Anvil Creek (NM236). Attempts were made to dredge gold along the lower river in 1900 and 1904 (Collier and others, 1908, p. 170). Dredges operated in the lower river between 1919 (Harrington, 1921, p. 232-233) and 1924 (Smith, 1926). Dredging in 1919 was mainly to deepen the channel, but gold was recovered during this operation. This part of Snake River reworks coastal plain deposits, and some richer gold concentrations may at least locally have been present.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Alluvial 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:** Probably inactive**Workings/exploration:**

Remnants of dredge tailings may locally be present.

Production notes:**Reserves:****Additional comments:****References:**

Schrader and Brooks, 1900; Collier and others, 1908; Harrington, 1921; Smith, 1926; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)**Reporter(s):** C.C. Hawley and Travis L. Hudson**Last report date:** 7/10/2000

Site name(s): Lower Snake River (upstream of the Nome airport)

Site type: Mine

ARDF no.: NM311

Latitude: 64.5225

Quadrangle: NM C-1

Longitude: 165.4889

Location description and accuracy:

There is small area of placer mine tailings along the north bank of Snake River at this location, about 0.4 mile upstream of the Nome airport. This is locality 130 of Cobb (1972 [MF 463], 1978 [OFR 78-93]). The map location is just inside the west-central edge of section 21, T. 11 S., R. 34 W., Kateel River Meridian. The location is accurate to within about one-third mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Fine gold was discovered on the bars of lower Snake River in 1898 (Schrader and Brooks, 1900). This location was plotted separately by Cobb (1972 [MF 463]) and some placer tailings appear to be present. Dredge operations took place on lower Snake River between 1919 and 1924 (Cobb, 1978 [OFR 78-9]). At least some of the dredge operations were part of a harbor-deepening project, and gold recovery was incidental. This part of Snake River reworks coastal plain deposits, and some richer gold concentrations may at least locally be present.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

Alluvial 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: Probably inactive

Workings/exploration:

Remnants of dredge tailings may locally be present.

Production notes:

Reserves:

Additional comments:

References:

Schrader and Brooks, 1900; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Cobb, 1978 (OFR 78-93)

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

Site name(s): Nome River (2 miles below Banner Creek)

Site type: Prospect

ARDF no.: NM312

Latitude: 64.6147

Quadrangle: NM C-1

Longitude: 165.2967

Location description and accuracy:

Gold dredging was attempted at this location on Nome River approximately 2 miles below Banner Creek. The map location is at the southwest corner of section 16, T. 10 S., R. 33 W., Kateel River Meridian. It is locality 115 of Cobb (1972 [MF 463], 1978 [OFR 78-93]) and is probably accurate to within one-third mile.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Fine gold is commonly found on the bars of Nome River. This site is an area where an unsuccessful dredge operation was attempted below the mouth of Banner Creek (Moffit, 1913).

Alteration:

Age of mineralization:

Holocene.

Deposit model:

Alluvial placer Au (Cox and Singer, 1986; model 39a).

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

39a

Production Status: Undetermined.

Site Status: Inactive

Workings/exploration:

Inasmuch as this location is on the active flood plain of Nome River, remnant tailings or other workings are not likely to be preserved.

Production notes:**Reserves:****Additional comments:****References:**

Moffit, 1913; Cobb, 1972 (MF 463); Cobb, 1978 (OFR 78-93).

Primary reference: Moffit, 1913

Reporter(s): C.C. Hawley and Travis L. Hudson

Last report date: 7/10/2000

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