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PRELIMINARY REPORT OF PLATINUM-GROUP ELEMENT OCCURRENCES IN ALASKA

By

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PRELIMINARY REPORT OF PLATINUM-GROUP ELEMENT OCCURRENCES IN ALASKA

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INTRODUCTION

Information in this report was compiled from a variety of sources. Most of the unpublished data and some of the published data were generated during strategic and critical mineral and mining district studies by the Bureau of Mines, Alaska Field Operations Center. Much of the unpublished data has been compiled into field reports which are available for inspection at the Bureau's Fairbanks Office. Many of the sites mentioned in the text are described in more detail by Berg and Cobb (1967), Cobb (1973), Foley and Barker (1985), and Foley and others (1984, 1985, and 1986). Additional references are contained in Cobb (1975). Data pertaining to periods of mining claim activity were largely acquired from the Alaska Kardex System and the Bureau of Mines Mineral Industry Location System (MILS) databases. These databases provide mining claim and mineral property locations, periods of activity, operators, literature references, and at least for older mining claims, commodities. These data are available to the public from the Bureau of Mines Juneau Office and the Alaska Division of Mining in Fairbanks.

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Table 1. - PGE Mineral Deposits and Occurrences in Alaska

No.	Location	Commodities:
1.	Avan Hills N 68° 15', W 161° 54'	Cr, PGE:
<p>Platinum and palladium were detected in chromite-bearing dunite (0.014 troy oz/st Pt) and tailed chromite concentrates (0.016 troy oz/st Pd). Iridium was detected in a pan concentrate sample (0.0036 troy oz/st). 465,000-1,734,000 st Cr₂O₃ is estimated in 26 measured deposits in variably serpentinized dunite with associated wehrlite, clinopyroxenite, and gabbro. At least 50 other minor or unmeasured chromite occurrences, and potential for large, low-grade chromite and PGE placer deposits are present in the area.</p>		
Ref.	Foley and others, 1985 and 1986; Unpublished Bureau of Mines data.	
2.	Misheguk Mountain, N 68° 15', W 161° 06' & N 68° 17', W 160° 50'	Cr, PGE:
<p>Up to 0.123 troy oz/st (4,200 ppb) Pt, 0.137 (4,700 ppb) Pd, 140 ppb Ir, 45 ppb Os, 360 ppb Rh, 98 ppb Ru, and 14 ppb Au was found in chromite pods in dunite and clinopyroxenite. The clinopyroxenite body is within a larger dunite-peridotite mass. Up to 0.004 troy oz/st Pd and 0.005 troy oz/st Pt were found in plagioclase peridotite with accessory pyrrhotite, and 0.001 troy oz/st (42 ppb) Pt, 22 ppb Pd, 1 ppb Ir, and 6 ppb Rh in dunite. Spherrillite and argentite were identified by SEM analysis of PGE-rich iron-rich chromian spinel sample. Chromium reserve estimates include 117,000-349,000 st Cr₂O₃ in 9 low-grade banded zones in dunite with associated peridotite, pyroxenite, and gabbro; the largest of these zones contains between 78,000 and 261,000 st Cr₂O₃. At least 30 additional unmeasured chromite occurrences plus chromite and PGE placer potential are present.</p>		
Ref.	Degenhart and others, 1978; Foley and others, 1985 and 1986; Unpublished Bureau of Mines data.	
3.	Lucky Boy #8, Wiseman N 67° 54' 18", W 150° 27' 05"	Au, Cu, PGE:
<p>PGE and copper were reported in lode gold samples.</p>		
Ref.	Bureau of Mines MILS database; Alaska Division of Mining Kardex System.	
4.	Limestone Creek N 67° 34' 19", W 149° 22' 55"	Ag, Ni, Pd:
<p>Anomalous palladium, nickel, and silver were reported in Skagit Limestone sample. Later examination of the reported occurrence revealed no PGE.</p>		
Ref.	Brosge' and Reiser, 1964; Cobb, 1973; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.	
5.	Christian River N 67° 23', W 146° 22'	Cr, PGE:

Seven percent chromite was observed in rock sample from Levi Creek and 6.6 pct Cr_2O_3 was detected in a rock sample near Christian River at the head of Timber and Marten Creeks. 0.003 troy oz/st Pt and 0.0006 oz/st Pd in Cr-bearing magnetite from Levi Creek and traces of PGE in pyroxenite, peridotite, dunite, and gabbro from the Christian River ophiolite complex.

Ref. Hawley and Garcia, 1976; Enns and Findlay, 1977.

6. Caribou Mountain Cr, PGE:
N 66° 25', W 150° 38'

Head analyses of a single high-graded chromite sample indicate 0.039 troy oz/st Pt and 0.011 troy oz/st Pd. Chromium resources of 2,000-2,500 st Cr_2O_3 are contained in three deposits containing high-chromium chromite and magnesian chromhercynite in banded intervals up to 10 ft thick and exposed for up to 50 ft along strike. Seven additional unmeasured or minor occurrences of banded and disseminated chromian spinel are present in the ultramafic portion of the Yukon-Koyukuk ophiolite at Caribou Mountain.

Ref. Clautice, 1978; Dahlin and others, 1983; Foley and McDermott, 1983; Foley and others, 1985.

7. Lower Kanuti River Cr, PGE:
N 66° 17', W 150° 52'

Tabled chromite concentrate from one chromite occurrence contained 0.010 troy oz/st Pt. 700-800 st of contained Cr_2O_3 in banded and disseminated high-chromium chromite occurs in a 5-ft-thick by 80-ft-long exposure. Thirteen additional unmeasured or minor chromite occurrences are present in the ultramafic portion of the Yukon-Koyukuk ophiolite complex at the Lower Kanuti River mass.

Ref. Clautice, 1978; Dahlin and others, 1983; Foley and McDermott, 1983; Foley and others, 1985.

8. Bear Creek Au, PGE:
N 66° 11' 37", W 155° 44' 00"

Platinum-group metals were reported in samples collected in the 1920's. - later proven false.

Ref. Cobb, 1973, p. 144; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

9. Granite Mountain area Au, PGE:
N 65° 20' 00", W 161° 16' 00"

Platinum-group metals were recovered during placer gold mining operations on streams draining the Mid-Cretaceous Granite Mountain alkaline complex. The complex is composed of a hornblende-pyroxene syenite core surrounded by monzonite with a border of pseudoleucite syenite, biotite pyroxenite, and various types of garnet-bearing nepheline syenite. Unpublished aeromagnetic data indicate that an intrusive ultramafic complex, much larger than the exposed 30 square mile Granite Mountain complex, lies beneath the surface (personal communication, Mark McDermott, formerly with Anaconda Minerals Company, Anchorage, Alaska).

- a. Bear Creek and tributaries
N 65° 33' 00", W 161° 04' 00"

"Platinum" was reported in placer gold concentrates in early 1900's and "platinum-group metals" were identified in samples collected in the 1920's.

b. Quartz Creek

N 65° 30' 00", W 161° 17' 00"

40 platinum-iron alloy grains picked from placer gold concentrate in 1984 averaged 80 pct Pt and 20 pct Fe.

c. Sweepstakes Creek and tributaries

N 65° 20' 00", W 161° 16' 00"

Platinum-iron alloy, osmiridium, chromian spinel, and ilmenite were identified in placer gold concentrates. Concentrate assay indicated 49.6 troy oz/st Pt and 0.350 troy oz/st Pd. The creeks were mined for Au intermittently from 1909-1965.

d. Dime Creek

N 65° 12' 23", 161° 09' 20"

About 10 troy oz in 1916 and thirty-five troy oz PGE were recovered from 7,500 troy oz placer gold in 1917. The area was mined for Au from 1915-1952. PGE and chromite were possibly derived from peridotite body at the head of Dime Creek.

Ref. Harrington, 1919b, p. 373; Patton, 1967; Cobb, 1973, 80-81; Unpublished Bureau of Mines data.

10. Penny River

N 64° 33' 00", W 165° 42' 10"

Au, PGE:

Small quantities of "platinum" reported in gold placers in 1923.

Ref. Mertle, 1918, p. 432, 439; Cathcart, 1922, p. 240; Brooks, 1925, p.30; Berg and Cobb, 1967, p. 124; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

11. Bluestone River

N 65° 04' 00", W 166° 11' 00"

Au, Hg, Pt,
W, PGE:

Minor platinum reported in placer gold concentrates from Bluestone River and its' tributaries, Gold Run and Alder Creek. Traces of platinum and palladium were detected in numerous small stocks of greenstone within the vicinity of the creeks.

Ref. Collier and others, 1908; Anderson, 1947, p. 43-44; White, and others, 1953, p. 1; Sainsbury and others, 1969, p. 15-16; Unpublished Bureau of Mines data.

12. Granite Creek

N 64° 21' 13", W 155° 26' 05"

PGE:

Minor platinum was produced as byproduct during placer gold mining.

Ref. Moffit, 1927, p.33; Miller and Elliot, 1969; Cobb, 1973, p. 170; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

13. Kalyuh Hills and Yuki River Cr, PGE:
N 64° 13' 00", W 156° 41' 00"

Platinum-Group elements were detected in placer samples from the Yuki River Valley, adjacent to ophiolitic rocks in the Kalyuh Hills. The potential exists for recoverable PGE and chromite in placer deposits in this area (personal communication, Tom Hinderman, Alaska Earth Resources, Anchorage, Alaska).

Four high-chromium chromite deposits contain 17,000-37,000 st Cr_2O_3 . These chromite deposits are hosted by dunite. The largest deposit contains a 3-ft-wide by 300-ft-long massive chromite layer and the other three deposits are low-grade banded and disseminated zones with 5 pct or less chromite. Fourteen additional minor or unmeasured occurrences of chromite are present.

Ref. Foley and others, 1984, 1985, and 1986.

14. Anvik River, Kuskokwim Au, PGE:
N 63° 27' 55", W 160° 31' 35"

Prospectors reported "platinum" with placer gold on bars along the Anvik River. Paleozoic and Mesozoic volcanic rocks in the region include diabase, intrusives, serpentinite, mafic volcanic and metavolcanic rocks. Gold mining activity occurred from 1900 to 1961. No recorded platinum production.

Ref. Harrington, 1918; Cobb, 1973; Bureau of Mines MILS database; Alaska Division of Mines Kardex System.

15. Boob Creek Cr, PGE:
N 63° 19' 50", W 157° 00' 07"

Thirty troy oz PGE was produced during placer gold mining in 1917. PGE and chromite were eroded from the nearby ophiolitic Mount Hurst dunite and peridotite. Platinum-iron alloy containing 90-92 pct Pt, about 5 pct Fe, and up to 2 pct Rh, and osmiridium with minor ruthenium were identified by microprobe analysis of a placer concentrate taken from a prospect pit excavated in 1986.

Ref. Harrington, 1919a, p. 349-350; Moffit, 1927, p. 33; Roberts, 1984b; Cobb, 1973, p. 152; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mines Kardex System.

16. Mount Hurst Cr, PGE:
N 63° 12' 00", W 156° 51' 00"

Up to 0.026 troy oz/st Pt was detected in chromitite samples. Chromite occurs in seven dunite bedrock and nine dunite float occurrences. Largest bedrock occurrence contains from 35 to 80 pct ferroan microchromite, is exposed for 26 ft along strike, and ranges from 6 to 32 in wide.

Ref. Roberts, 1984a and b.

17. Marshall District Au, PGE:

a. Disappointment Creek
N 61° 52' 31", W 161° 53' 12"

b. Willow Creek
N 61° 48' 30", W 161° 54' 10"

c. Wilson Creek
N 61° 53' 00", W 161° 57' 00"

Small amounts of platinum was reported to be present in placer gold concentrates. The platinum was probably derived from greenstone bedrock in the region. Placer mining activity has been reported in the area since 1900.

Ref. Harrington, 1918; West, 1954; Cobb, 1973, p. 162; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

18. Tuluksak River Au, PGE:
N 60° 59' 08", W 159° 59' 25"

A small amount of platinum was recovered with placer gold.

Ref. Hoare and Coonrad, 1959; Cobb, 1973, p. 42; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

19. Bear Creek Au, PGE:
N 61° 03' 00", W 59° 47' 00"

A small amount of platinum was reported in placer gold concentrates.

Ref. Mertie, 1969, p. 89-90.

20. Island Mountain and Arolik (Arolic) River area. Au, PGE

a. Snow Gulch
N 59° 32' 40", W 161° 25' 25"

b. Butte Creek
N 59° 29' 35", W 161° 28' 50"

c. Kowkow Creek
N 59° 28' 15", W 161° 26' 50"

The area has had intermittent mining activity since 1900. A small amount of PGE was produced during exploration by the Goodnews Bay Mining Company and other operators. The PGE that was produced from these areas by the Goodnews Bay Mining Company was combined for processing and recovery with the PGE produced from the Salmon River placers. The PGE at Kowkow Creek and Butte Creek were probably derived from ophiolitic mafic and ultramafic rocks at nearby Island Mountain, Tatlignagpeke Mountain, and Mitiak Mountain. Platinum group elements are also included in the list of commodities for claims on nearby Faro Creek

and Trail Creek.

Ref. Mertie, 1969, p. 89-90; Cobb, 1973, p. 47-48; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

21. Kislogle Mountain area Au, PGE:

a. Bear Creek
N 59° 24' 00", W 161° 07' 00"

b. Slate Creek
N 59° 21' 00", W 161° 09' 00"

A small amount of PGE was produced during prospecting by the Goodnews Bay Mining Company and combined for processing and recovery with the PGE produced from the Salmon River placers. A sluice box concentrate from a .10 yd³ placer sample from Bear Creek contained 6,500 ppb Pt and >10,000 ppb Pt with 325 ppb Pd was detected in a similar placer sample from Danielson Creek, a tributary of Bear Creek.

Ref. Mertie, 1969, p. 89-90; Fechner, 1988.

22. Tatlignagpeke Mountain Cr, PGE:
N 59° 23', W 161° 25'

Accessory chromite and traces of Pt and Pd are present in dunite and peridotite.

Ref. Foley and others, 1985, 1986; unpublished Bureau of Mines data.

23. Salmon River placers, Red Mountain, and marine placers Au, Cr, Hg,
PGE:
N 58° 57' 00", W 161° 45' 00"

Over 650,000 troy oz PGE and about 10,000 troy oz Au have been produced from placers by the Goodnews Bay Mining Company and other operators since 1927. The source for the PGE is thought to be the Goodnews Bay Alaskan-type, zoned ultramafic complex at Red and Susie Mountains. No economic lode deposits have been found in the complex, which has been explored as recently as 1987 and 1988 by Ashton Mining Company.

Geochemical data and the common presence of intergrown chromite and magnetite with platinum-iron alloy in placer concentrates indicate that PGE are concentrated with chromite and magnetite in dunitic portions of the Goodnews Bay complex. Anomalous platinum was detected in pan-concentrated soil samples at the summit and south and northeast ends of the complex and anomalous platinum and palladium, in some cases associated with copper-iron sulfide minerals, were detected in magnetite clinopyroxenite border zones by Ashton and by the Bureau of Mines (personal communication, Toni Hinderman, Alaska Earth Resources, Anchorage, Alaska).

In the placers near Red Mountain, platinum is the most abundant PGE in concentrates and occurs primarily as platinum-iron alloy of variable composition. Osmiridium and Iridosmine are the next most abundant PGE minerals but make up less than 10 pct of the precious metal concentrates. Other PGE minerals include minor sperrylite, hollingworthite, and Ir-Fe, Ir-S-As-Rh-Pt-Fe, Rh-As-Pd-Ni, and Pb-S-Rh-Fe-Ir minerals associated with magnetite. Gold makes up between less than 1 pct and 5 pct of the precious metal concentrates. Remaining resources include an estimated 40 million yd³ of tailings grading between 0.0013 and 0.017 oz/yd³, and low

grade (0.0021 oz/yd³) unmined, unfrozen, measured and indicated resources in the lower bench paystreak, which is up to 200 ft deep. Additional unmeasured alluvial placer resources are indicated at the northwest side of Red Mountain.

Gold and PGE have been geochemically detected and mineral grains identified in offshore and onshore marine placers from Goodnews Bay to Chagvan Bay, to the north and south of Red Mountain. Identified PGE minerals include isoferroplatinum, osmiridium, platiridium, sperrylite, and moncheite. Also present in the samples are chromite, magnetite, ilmenite, zircon, cinnabar, and native mercury. Based on bathymetry surveys, magnetometer surveys, seafloor sampling, limited drilling, and scanning electron microscope studies, several deposit types have been identified or suggested. These include: onshore, swashzone, heavy mineral concentrations and drowned alluvial and marine placers. Magnetometer survey data indicate that the Goodnews Bay complex extends at least six miles offshore, and reworked residual submarine placers may exist on top of the submerged ultramafic bedrock.

Ref. Mertle, 1940, 1969, and 1976; Bird and Clark, 1976; Rosenblum and others, 1982, 1986; Carlson, 1983; Ulrich, 1984; Southworth, 1986, Southworth and Foley, 1986; Barker and Lamal, 1988; Fechner, 1988; Zelenka, 1988; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

24. Roberts PGM Ag, Au, Co, Cu,
Ni, PGE:
N 62° 11' 37", W 154° 26' 43"

An unconcentrated head sample of semimassive and massive sulfide segregations in serpentinized, fault-bounded, mafic and ultramafic dike contained 237 ppb Au, 940 ppb Pd, 960 ppb Pt, 0.02 pct Co, 0.31 pct Cu, and 0.54 pct Ni. A sulfide flotation concentrate from the same sample contained 22 ppm Ag, 1,200 ppb Au, 9,400 ppb Pd, 6,600 ppb Pt, 650 ppb Ir, 790 ppb Os, 330 ppb Rh, 1,300 ppb Ru, 0.16 pct Co, 4.71 pct Cu, and 4.68 pct Ni. The dike cuts phyllite and siliceous mudstone and is exposed in a 20 by 60 ft area. Ore minerals include abundant pyrrhotite, with minor chalcopyrite, pyrite, bravoite, and sphalerite. Scanning electron microscope examination revealed Pt-Pd-Bi-Te-Sb minerals.

Ref. Unpublished Bureau of Mines data.

25. Happy River Au, PGE:
N 62° 00' 05", W 152° 27' 00"

Unconfirmed reports of up to 3.8 troy oz/st Ag, 0.102 troy oz/st Pd, and 0.35 troy oz/st Pt in altered hypabyssal rocks and anomalous PGE in fine-grained gabbro with anorthosite nodules. The current property owner also reports up to 10 troy oz/st Pt in placer concentrates. Analyses detected 1,940 ppb Au in one tabbed placer sample but no PGE were detected in placer or rock samples that were donated to the Bureau of Mines.

Ref. Nemeth, 1987; Unpublished Bureau of Mines data.

26. Kichatna River Au, PGE:
N 62° 09' 07", W 151° 45' 12"

Platinum and fine gold were reported in 1917 by prospectors to be present in pan and sluice box concentrates.

Ref. Martin, 1919; Cobb, 1973, p. 23; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

27. Upper Yentna District

Cache Creek area (upper Yentna District)
N 62° 28' 30", W 151° 00' 45"

Au, Cr, PGE:

Small amounts of PGE were recovered during placer mining on Cache Creek, Peters Creek, Poorman Creek, Willow Creek, Ruby Creek, Canyon Creek and other streams in the upper Kahlitna River Valley. Chromite was present in concentrates. PGE and chromite were probably derived from serpentinized and silica-carbonate altered, fault-bounded ultramafic rocks that parallel the Chulitna-Yentna Mineral Belt.

Ref. Mertle, 1919, p. 233-264; Cobb, 1973, p. 22; Robinson and others, 1955; Clark and Hawley, 1968; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

28. Lake Creek

N 62° 13' 40", W 151° 07' 40"

Au, PGE:

Platinum was reported from streams in Lake Creek area which drain Fairview Mountain.

Ref. Martin, 1919, p. 33; Cobb, 1973, p. 22; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

29. Shulin Bar (Sholan Bar) and Round Bend Bar

N 62° 08' 50", W 150° 53' 00"

Au, PGE:

A small amount of PGE was recovered in 1917 during small-scale placer gold mining and prospecting along lower Kahlitna River.

Ref. Mertle, 1919, p.262-263; Cobb, 1973; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

30. Boulder Bench

N 62° 06' 45", W 150° 53' 00"

Au, PGE:

A small amount of PGE was recovered in 1917 during small-scale placer gold mining and prospecting. The location is uncertain, but reported to be downstream from Roundbend Bar and upstream from the lower Kahlitna River Camp at Beaver Creek.

Ref. Mertle, 1919, p.262-263.

31. Beaver Creek

N 62° 03' 24", W 150° 00' 55"

Au, PGE:

A small amount of PGE was recovered in 1917 during small-scale placer gold mining and prospecting at lower camp on Kahlitna River.

Ref. Mertle, 1919, p.262-263.

32. Halibut Bay

Cr, Cu, Ni,

PGE:

N 57° 21' 28", W 154° 36' 00

Stannopalladinite, cobaltian pentlandite, pyrrhotite, chalcopyrite, uvarovite, and villamanite were identified in pyroxene peridotite and olivine peridotite from which a flotation concentrate containing 11.8 pct Cu, 1.55 pct Ni, 0.083 pct Co, 0.159 troy oz/st Pt, 0.336 troy oz/st Pd, 0.133 troy oz/st Au, and 20 troy oz Ag was produced. Grab samples from this location contain up to 0.012 troy oz/st (420 ppb) Pt, 0.014 troy oz/st (480 ppb) Pd, 3,629 ppm Cu, 839 ppm Ni, and 7,700 ppm chromium. 201,000 st contained Cr_2O_3 are present in seven deposits in the cumulate dunite portion of the ophiolitic ultramafic mass at the southwest end of the Border Ranges complex. The dunite is interlayered with peridotite. The largest deposit contains 196,000 tons Cr_2O_3 and is a 1,000-ft-long, low-grade banded zone averaging 5 pct chromite. Chromite is abundant in pan-concentrate samples from valleys draining the ultramafic rocks. Minor wispy chromite segregations and schlieren occur throughout dunite in the Halibut Bay and nearby Sturgeon River mass.

Ref. Burns, 1985; Dahlin and others, 1985; Foley and Barker, 1985; Foley and others 1985 and 1986; Unpublished Bureau of Mines data.

33. Ayakulik Beach, Red River, and Canvas Island
N 57° 14' 00", W 154° 33' 30"

Cr, PGE:

Minor platinum and abundant "chromic sands" were reported in heavy mineral concentrates from beach sands along west coast of Kodiak Island, and small amount of platinum was recovered during placer gold mining. Analyses indicate Pt, Ir, and Os are the most abundant PGE present. Chromite and PGE were probably derived from ultramafic rocks of the Border Ranges complex, inland of the coastline.

Ref. Maddren, 1919, p. 316-317; Cobb, 1973, p. 38-40; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

34. Muskomee Bay
N 58° 06' 00", W 153° 04' 00"

Au, Pb, PGE:

PGE among commodities listed for lode claims in Bureau of Mines MAS database.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

35. Claim Point
N 59° 13' 00", W 151° 49' 30"

Cr, PGE:

A tabled chromite concentrate from one sample at Claim Point contained 0.034 troy oz/st Pt and 0.072 troy oz/st Pd. Fourteen grab and chip samples from the same chromite mass contained from less than 15 to 100 ppb Pt and from 2 to 30 ppb Pd. Chromite-rich pan-concentrated beach sand samples contained traces of Pt (<15-45 ppb) and Pd (<2-45 ppb). 2,200 short tons of chromite ore were produced in 1917 and 1918. 90,000 st of contained Cr_2O_3 in 16 deposits of banded chromite in dunite is estimated to be present. The grades are thought to range from 5 to 30 pct contained Cr_2O_3 . Eight other deposits are present for which no reserve estimates have been calculated.

Ref. Gill, 1922; Guild, 1942; Sanford and Cole, 1949; Burns, 1985; Dahlin and others, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986; Unpublished Bureau of Mines data.

36. Red Mountain Cr, PGE:
N 59° 21' 20", W 151° 28' 05"

Chip samples across the Turner Stringer Zone chromite deposit contained up to 690 ppb Pt and 485 ppb Pd. About 29,000 st of ore containing from 38 to 43 pct Cr_2O_3 was produced between 1943 and 1958. Reserve estimates include 1.6 million st of contained Cr_2O_3 in thirty-three deposits. Of those reserves, 97,000 st of Cr_2O_3 are estimated in 20 relatively high-grade deposits with over 20 pct chromite. The bulk of the reserves, 1.487 million st, are in three low-grade deposits with 5 to 6 pct Cr_2O_3 . These are the Turner Stringer Zone (1.25 million st Cr_2O_3), the Star Stringer Zone (208,000 st Cr_2O_3), and the Horseshoe Stringer Zone (29,000 st Cr_2O_3). An additional 556,000 st of Cr_2O_3 are estimated in the 20,920,000 yd³, Windy River placer chromite deposit at Red Mountain, which may also constitute a PGE resource.

Ref. Gill, 1922; Guld, 1942; Anaconda, 1981; Burns, 1985; Dahlin and others, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986.

37. Huslia Placers PGE, Au:
N 60° 59' 05", W 149° 34' 30"

PGE among commodities listed in U.S. Bureau of Mines MILS database for 132 placer claims located on a point in Turnagain Arm, just east of Falls Creek along the Seward highway.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

38. Eklutna (E) and Pioneer Creek (PC) Cr, PGE:
(E)- N 61° 24', W 149° 21'
(PC)- N 61° 27', W 149° 11'

An estimated 1,000 st Cr_2O_3 are present in four deposits up to 175 ft long and 40 ft wide plus two other reported occurrences. Ten samples, including gabbro, hornblende, pyroxenite, peridotite, and dunite contained averages of 46 ppb Pt and 40 ppb Pd with maxima of 100 ppb each in clinopyroxenite with accessory magnetite and traces of native copper.

Ref. Gates, 1942; Rose, 1966; Clark and Greenwood, 1972; Burns, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986.

39. Metal Creek Au, PGE:
N 61° 26' 30", W 148° 30' 45"

A small amount of platinum was recovered during intermittent placer gold mining (Cobb, 1973, p. 17). The source of platinum has not been determined, but most likely, is the nearby Wolverine ultramafic complex.

Ref. Richter, 1967, p. 2, 8-10, 15-16; Clark, 1972; Cobb, 1972, 1973, p. 17; Burns, 1985; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

40. Boulder Creek (Schoonoven Creek) Au, PGE:
N 61° 50' 00", W 148° 21' 30"

Platinum is included as a commodity for Boulder Creek placers in the Alaska Division of Mining Kardex System.

Ref. Mendenhall, 1900; Cobb, 1972; Bureau of Mines MILS database, Alaska Division of Mining Kardex System.

41. Willow Creek PGE,
N 61° 44' 30", W 149° 26' soapstone:

Traces of Pt (0-30 ppb) and Pd (0-30 ppb) are present in serpentinite with up to 5,000 ppm Cr and 2,000 ppm Ni. An open-cut soapstone mine was observed at the head of Willow Creek in 1978.

Ref. Csejtey and Evarts, 1979.

42. Alfred Creek Au, PGE:
N 61° 57' 07", W 147° 28' 25"

A small amount of platinum was reported in gold placers.

Ref. Martin and Mertle, 1914, p. 278-279, 281; Brooks, 1925, p. 30; Cobb, 1972, 1973, p. 19; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

43. Albert Creek (AC), North Creek (NC) Au, PGE
(AC)- N 62° 00' 22", W 147° 19' 36"
(NC)- N 62° 01' 25", W 147° 19' 54"

A small amount of platinum was produced during placer gold mining in 1913. Small-scale placer mining took place intermittently from 1912 to 1961.

Ref. Cobb, 1972, 1973, p. 29.

44. Gold Creek Au, PGE:
N 62° 15', W 147° 45'

3,100 ppb Pt and over 10,000 ppb Au was detected in heavy mineral concentrates. The PGE may be derived from Tertiary gravels.

Ref. Unpublished Bureau of Mines data.

45. Yacko Creek Au, PGE
N 62° 12' 00", W 147° 20' 00"

9,600 ppb Pt was detected in a pan-concentrate sample. The current property owner reports precious metal placer concentrates contain 4 pct Pt. Jurassic conglomerates that are reconcentrated in modern placers may be the source of the gold and PGE.

Ref. Unpublished Bureau of Mines data.

46. Busch Creek (B& M claims) Au, PGE:
N 62° 29' 00", W 147° 37' 30"

Gold and PGE are present in placers on Busch Creek. Analysis of heavy mineral concentrate contained up to 120 ppb Pd, 1,060 ppb Pt, and 371 ppm Cr. B&M claims 1-4, one mile downstream from Bureau of Mines sample site, were active from 1967 through 1979; gold and PGE are listed as commodities in Bureau of Mines MILS database.

Ref. Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

47. Copeland Creek-Ohlo Creek Co, Cr, Ni,
N 63° 07' 45", W 149° 45' 30" PGE:

Small chromite pods and accessory chromite with traces of Pt (97 ppb), Pd (99 ppb), and Rh (19 ppb) are present in 1,000-ft-wide by 3-mile-long fault-bounded serpentinitized and silica-carbonate-altered dunite and peridotite mass.

Ref. Hawley and others, 1969; Hawley and Clark, 1973 and 1974; Unpublished Bureau of Mines data; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System..

48. Moose Creek (MC) and California Creek(CC) Au, PGE:
(MC)- N 64° 02' 21", W 148° 58' 30"
(CC)- N 64° 06' 15", W 148° 44' 30"

PGE are present in placer gold concentrates from creek draining acidic intrusive rocks at the head of Moose Creek. Both creeks have been intermittently mined for placer gold since 1903 and PGE are reported in the concentrates.

Ref. Cobb, 1973, p. 111; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

49. Livengood Creek Cr, PGE:
N 65° 32', W 148° 30'

Accessory chromite in serpentinite and in placer gold concentrates is present in Livengood Creek and nearby streams. PGE was detected in placer concentrates from Livengood Creek, in gold bullion from local placer mines, and one lode prospect, and traces of platinum were found in serpentinite.

Ref. Overbeck, 1920, p. 183-184; Joesting, 1942, p. 17; Foster and Chapman, 1967; Cobb, 1973; Cathrall and others, 1987; Unpublished Bureau of Mines data.

50. Parker Prospect asbestos, Cr,
N 65° 29' 40", W 148° 23' 40" Cr, PGE?:

Chromite, magnetite, chrysotile, and nickel-iron alloys were reported in nickeliferous alpine-type serpentinites. Ni is present in alloys, silicate, sulfide, and spinel-group minerals. Whole rock analysis show up to 0.4 pct. Ni. No data for PGE is present, however, Pt is listed as a commodity in the Bureau of Mines MILS database. The observed mineral assemblage indicates a likelihood of PGE.

Ref. Foster and Chapman, 1967; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

51. Apex 1-12 Au, PGE:
N 65° 25' 45", W 148° 20' 35"

PGE listed as a commodity in Bureau of Mines MILS database and the Alaska Division of Mining Kardex System.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

52. Beaver Creek, asbestos, Cr, Ni,
N 65° 37' 40", W 148° 48' 50" PGE:

Up to 0.51 pct Ni and detectable platinum, palladium, and rhodium were found in serpentinite bedrock samples. Thin chrysotile veinlets in serpentinite bedrock and chromite are present in serpentinite scree.

Ref. Foster, 1969; Chapman and others, 1971; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

53. Caribou Creek PGE:
N 64° 41', W 146° 17'

7.1 and 0.1 troy oz/st Pt were detected in two dredge concentrate samples.

Ref. Unpublished Bureau of Mines data.

54. Nall Ridge (NR) and Salcha River (SR) Cr, Cu, Ni, PGE:
(NR)- N 64° 45', W 144° 51'
(SR)- N 64° 43' 35", W 145° 24' 00"

Traces of platinum and 0.6 pct Ni were found in serpentinite at the head of Nickel Creek. High-Al, high-Mg chromite is disseminated throughout serpentinitized and carbonate-silica-altered peridotite masses. Pyrrhotite and chalcopyrite occur as accessory minerals and are concentrated in an iron-stained zone where 3.5 troy oz/st Pd were reported in a rock sample. Follow-up investigations by the Bureau indicate the reported Pd values were erroneous.

Ref. Joesting, 1942; Eberlein and others, 1977; Foster and others, 1979; Southworth, 1984; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

55. Woodchopper Creek Au, PGE:
N 65° 17' 40", W 143° 24' 50"

Traces of platinum and iridium were found in placer gold.

Ref. Mertie, 1942; 1969; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

56. Boulder Creek Cr, PGE:

N 64° 50', W 141° 11'

Osmiridium grain and chromite were present in pan concentrate sample.

Ref. Barker, 1986, p.17.

57. Washington Creek, Au, PGE:
N 65° 14', W 142° 20'

Platinum-Iron alloy grain was identified by microprobe analysis and 0.003 troy oz/st Pt was present in pan concentrate sample.

Ref. Mertie, 1969; Barker, 1986, p. 17; Unpublished Bureau of Mines data.

58. Fourth of July Creek Au, PGE:
N 65° 08' 00", W 141° 59' 10"

Traces of platinum and Iridium were present with placer gold. Platinum was claimed by US Treasury as seigniorage when gold was refined.

Ref. Mertie, 1942, 1969; Brabb and Churkin, 1965, 1969; Foster and Keith, 1968, 1969; Clark and Foster, 1969a, 1969b, 1971; Cobb, 1973, p. 125; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

59. Seventymile River, Lucky Gulch (LG), Broken Neck Creek (BN) Au, PGE:
(LG)- N 64° 57' 20", W 141° 35' 35"
(BN)- N 64° 56' 25", W 141° 43' 15"

Platinum found in placer gold concentrates from Lucky Gulch and platinum and Iridium found in placer gold concentrates from Broken Neck Creek. Platinum reported to be present as discrete grains at Lucky Gulch.

Ref. Joesting, 1942, p. 20; Mertie, 1942, 1969; Foster and Keith, 1968, 1969, and 1974; Clark and Foster, 1971; Cobb, 1973, p. 125; Keith and Foster, 1973; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

60. Butte Creek Au, PGE
N 64° 68' 30", W 142° 10' 30"

A 100-ft-thick sill of biotite-clinopyroxenite intrudes hornblende granodiorite. The sill is about two miles long, strikes northeasterly, and, dips moderately to the northwest. Clinopyroxenite samples from this sill contain up to 0.016 oz/ton combined Pt and Pd. Pan concentrate and sluice box samples collected from streams draining the clinopyroxenite contain up to 0.30 oz/ton combined Au, Pd, and Pt. Sperrylite and platinum-iron alloy grains were identified in placer concentrate samples.

Ref. Foster and Keith, 1968 and 1974; Keith and Foster, 1973; Unpublished Bureau of Mines data.

61. Carden Hills Cr, PGE:
N 62° 18', W 141° 43'

Coarse-grained, disseminated, slightly magnetic chromite is present in dunite layers that are interlayered with gabbro and pyroxenite. The largest exposed chromite-bearing area is from tens to hundreds of feet wide and thousands of feet long. Three chromite-bearing dunite samples contained from 0.002 to 0.02 troy oz/st combined Pt (50-300 ppb) and Pd (23-44 ppb) with traces of Ir, Rh, and Ru.

Ref. Foley and others, 1985; Unpublished Bureau of Mines data.

62. Platinum Creek PGE:
N 62° 27', W 142° 48'

Small amounts of placer platinum have been reported from Platinum Creek.

Ref. Rose, 1965, p.41.

63. Mineral PGE:
N 62° 52', W 143° 23'

Minor platinum and palladium were detected in twenty rock samples from fault-bounded, serpentized, and silica-carbonate-altered pyroxenite, peridotite, and dunite. Maximum combined detected PGE is 0.006 troy oz/st (125 ppb each, Pt and Pd).

Ref. Unpublished Bureau of Mines data.

64. Eagle Creek Ag, Au, PGE:
N 63° 01', W 144° 26'

A small amount of PGE was reported in gold placers. Claims were active intermittently from 1955 to 1976.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

65. Granite Creek, Fitzpatrick Ag, Au, Co
N 62° 59', W 144° 04' Cu, Ni, PGE:

96 ppb Pt, 94 ppb Pd, 12 ppb Au, 820 ppm Cu, and 1900 ppb Ni were detected in gabbro float proximal to Ag-, Au-, Co-, and Ni-containing magnetite skarn.

Ref. Unpublished Bureau of Mines data.

66. Upper Chistochina Mining District

66a. Chistochina Glacier (CG) and Big Four Gulch (BF) Au, Ag, Ni,
(CG)- N 63° 12', W 144° 52' PGE:
(BF)- N 63° 11', W 144° 48'

Traces of platinum, gold, silver, and 0.2 pct Ni were found in dunite boulder from Chistochina Glacier. Iron-platinum alloy with 83 pct Pt and 17 pct Fe, and minor chromite was identified in placer gold concentrate from Big Four Gulch.

Ref. Rose, 1967, p. 21; Unpublished Bureau of Mines data.

- 66b. Miller Gulch (MG), Slate Creek (SC), and Chistochina River, Middle Fork (CR) Au, Cu, Hg,
(MG)- N 63° 10' 12", W 144° 49' 35" PGE:
(SC)- N 63° 10' 06", W 144° 50' 15"
(CR)- N 63° 08' 10", W 144° 38' 40"

Iron-platinum alloy with 96 pct Pt and 4 pct Fe and osmium were recovered during placer gold mining. Ratio of platinum to gold in placer was 1:100. Native copper, native mercury, and cinnabar are particularly abundant in placer concentrates.

Samples from a diorite porphyry stock on Miller Gulch contain up to 400 ppb Pt, 65 ppb Pd, 507 ppb Au, 700 ppb Hg, and 100-300 ppm Cu. A rock sample from the same location, after crushing, pulverizing, and panning, contained 3,500 ppb Pt, 35 ppb Pd, 22 ppb Rh, and 9 ppb Au. A magnetic hornblende gabbro sample from the west side of Miller Gulch contained 29 ppb Pd. A plagioclase hornblendite sample with accessory pyrrhotite and trace chalcopyrite from the area contained 216 ppb Pt. Precious metal concentrates from Miller Gulch contain up to 1-2 pct PGE.

Ref. Mendenhall, 1903 and 1905; Mendenhall and Schrader, 1903; Chapin, 1919, pp. 137-141; Moffit, 1944, p. 31-33; Moffit, 1954, p. 34-40, 191-193; Berg and Cobb, 1967, p. 37-73; Rose, 1967, p. 23-25; Cobb, 1973, p. 28; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

- 66c. Ruby Gulch Ag, Au, Cu,
N 63° 09' 15", W 144° 46' 20" Hg, PGE:

At the heads of Ruby Gulch, Quartz Creek, and the next drainage to the east, argillites are intruded by differentiated, silicified and carbonate-altered diorite dikes, gabbro, pyroxenite, dunite, and serpentinite. A biotite pyroxenite sample contained 100 ppb Pt and a serpentinite sample contained 230 ppb Pt. Placer concentrates from Ruby Gulch contain gold, gold-copper alloy, native copper and mercury, cinnabar, and microscopic dendritic gold in native lead.

Ref. Mendenhall, 1903 and 1905; Mendenhall and Schrader, 1903; Chapin, 1919, pp. 137-141; Moffit, 1944, p. 31-33; Moffit, 1954, p. 34-40, 191-193; Berg and Cobb, 1967, p. 37-73; Rose, 1967, p. 23-25; Cobb, 1973, p. 28; Unpublished U.S. Bureau of Mines data; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

67. Canwell Glacier Au, Co, Cu, Ni,
N 63° 20', W 145° 35' PGE:

Copper-nickel sulfide minerals with associated cobalt, PGE, and gold are present in gabbro-norite dikes and sills, contact-related sulfide segregations, and massive sulfide deposits; fibrous chrysotile is particularly abundant at the west end of the Canwell Glacier mafic-ultramafic body. Five gabbro-norite samples from the Canwell Glacier body contained an average of 411 ppb Pd and 314 ppb Pt. Analyses of two samples yielded 540 ppm and 5,950 Cu, 1,440 and 3,730 Ni, 70 and 137 ppb Au. A quartz diorite sample with disseminated sulfides contained 340 ppm Co, 1.55 pct Cu, 2.65 pct Ni, 100 ppb Os, 600 ppb Pd, 400 ppb Pt, 45 ppb Rh, and 40 ppb Ru. A massive sulfide sample from the Canwell Glacier body contained 600 ppm Co, 0.96 pct Cu, 3.03 pct Ni, 270 ppb Au, 1,700 ppb Pd, and 1,770 ppb Pt.

Ref. Barker and others, 1985; Barker, 1988.

68. Glacier Lake
N 63° 21', W 145° 39' Au, Co, Cu, Ni,
PGE:

Up to 3 pct Ni and 2 pct Cu are present along the intrusive contact where granodiorite and quartz diorite intrudes serpentinite. Nine samples contain averages of 1.46 pct Cu, 2.89 pct Ni, 687 ppm Co, 25 ppb Au, 90 ppb Ir, 495 ppb Pd, 410 ppb Pt, 57 ppb Rh, 29 ppb Ru, and 25 ppb Au.

Ref. Barker and others, 1985; Barker, 1988.

69. Phelan
N 63° 14', W 145° 28' Au, PGE:

Placer samples from Phelan Creek contained Au and up to 760 ppb Pt.

Ref. Unpublished Bureau of Mines data.

70. Emerick prospect
N 63° 19' 40", W 145° 46' 00" Au, Co, Cu, Ni,
PGE:

Pyrrhotite, pyrite, pentlandite, chalcopyrite, and trace bornite were identified in a fault-bounded gabbro dike and the enclosing serpentinite on Miller Creek. About 1 pct each Cu and Ni were detected in nine mineralized samples averaging 189 ppm Co, 193 ppb Au, 16 ppb Ir, 4 ppb Os, 977 ppb Pd, 989 ppb Pt, 17 ppb Rh. Ru was not detected. Identified PGE minerals include merenskyite, palarskite, and larsite.

Ref. Barker and others, 1985; Barker, 1988; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

71. Ann Creek
N 63° 20', W 145° 50' Au, Co, Cu, Ni,
PGE:

Samples from a contact-related deposit where diorite intrudes serpentinite on upper Ann Creek contain up to 1.35 pct Ni, 2.65 pct Cu, 730 ppm Co, 450 ppb Pd, and 130 ppb Pt. Samples from another massive sulfide lens in the Ann Creek ultramafic body contain 3.5 pct Cu, 1.9 pct Ni, 340 ppm Co, 540 ppb Pd, 340 ppb Pt, and traces of iridium and rhodium. Sperrylite was identified in a gabbro dike sample that contained 200 ppm Co, 0.3 pct Cu, 0.44 pct Ni, 340 ppb Pd, and 273 ppb Pt.

Ref. Barker and others, 1985; Barker, 1988.

72. Rainy Creek & Broxson Gulch
(RC) N 63° 19', W 145° 55' Ag, Au, asbestos
(BG) N 63° 21', W 146° 05' & N 63° 21', W 146° 03' Co, Cu, Ni,
PGE:

At numerous locations on Rainy Creek, iron-copper-nickel-sulfides with traces of PGE, gold, and silver occur in hornfels and talc at gabbro and diorite contacts and as disseminated and massive sulfide segregations in serpentinite and gabbro. Sulfide- and native copper-bearing clots in dunite contain consistently elevated

Platinum claims were staked along the Nadina River from its mouth to the foot of the glacier at the head of the valley. The majority of prospecting was carried out within four or five miles of the foot of the glacier in the early 1900's. Mendenhall (1905) avows that not much platinum is present.

Ref. Mendenhall, 1905, p. 121-122; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

77. Tonsina ophiolitic mafic-ultramafic assemblage

77a. Bernard Mountain
N 61° 34' 15", W 145° 09' 30"

Cr, PGE:

Inferred reserve estimates include 343,000 st of contained Cr_2O_3 in seven low-grade deposits of banded and disseminated chromite in dunite. Numerous other small and unmeasured occurrences are present. Palladium (823 and 1,749 ppb) was detected in two high-chromium tabled concentrates from a 134-lb high-chromium chromite sample, but no PGE were detected in any other samples from Bernard Mountain.

Ref. Pittman, 1957; Wells, 1957; Hoffman, 1972; Burns, 1985; Dahlin and others, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986, and 1988; Newberry, 1986; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

77b. Sheep Hill
N 61° 35', W 144° 59'

Cr, PGE:

Inferred reserve estimates are from 45,000 to 70,000 st of contained Cr_2O_3 in two low-grade, high-iron chromite deposits with associated PGE. Samples from a 210- by 300-ft area with 5 pct chromite contained up to 0.27 troy oz/st (927 ppb) total PGE (515 ppb Pt and 412 ppb Pd) with associated Ir (< 75 ppb), Os (< 27 ppb), Rh (< 72 ppb), and Ru (< 45ppb). Pt/Pt+Pd values range from 0.57 to 0.75.

Ref. Dahlin, and others 1985; Burns, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986, and 1988; Newberry, 1986.

77c. Dust Mountain
N 61° 36', W 144° 56'

Cr, PGE:

Speculative reserve estimates include from 2.6 million to 5.3 million st of contained Cr_2O_3 in a 190- by 3,600- ft area comprising dunite, clinopyroxenite, clinopyroxene-rich peridotite, and high-iron chromitite, with associated PGE. PGE are preferentially associated with high-iron chromitites in clinopyroxene-rich horizons in the peridotite massif. Chromitite samples from this area contain up to 0.6 troy oz/st PGE (11,936 ppb Pd, 8,918 ppb Pt, 330 ppb Ir, 87 ppb Os, 550 ppb Rh, and 140 ppb Ru). Pt/Pt+Pd ratios range from 0.44 to 0.87. Identified PGE minerals include PGE-amalgams, arsenides, alloys, and sulfides. These minerals are concentrated along fractures and grain boundaries in serpentinitized, metasomatically, and magmatically altered high-iron chromian spinels. Maximum PGE concentrations were observed in malachite- and native copper-bearing, magnetic chromitites associated with dunite and coarse-grained clinopyroxenite.

Ref. Pittman, 1957; Wells, 1957; Burns, 1985; Dahlin and others, 1985; Foley and Barker, 1985; Foley and others, 1985, 1986, and 1988; Newberry, 1986.

78. Black Bear 1-4 PGE?:
N 61° 04' 00", W 146° 00' 30"

PGE are included as commodities in the Bureau of Mines MILS database and the Alaska Division of Mining Kardex System.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

79. Spirit Mountain Ag, Au, Co, Cu,
N 61° 18', W 144° 16' NI, PGE:

Disseminated and massive iron-copper-nickel sulfide minerals are present in sill-form peridotite-pyroxenite intrusions. Reserve estimates include 6,500 st of material grading from 0.22 pct Ni and 0.12 pct Cu to 7.61 pct Ni and 1.56 pct Cu. Ore minerals include pyrrhotite, pentlandite, bravoite, chalcopyrite, chalcocite, and hematite. Heads from a metallurgical sample contained 1.16 pct Ni, 0.76 pct Cu, 0.04 pct Co, 0.02 pct Zn, 0.007 troy oz/st, Au, 0.077 troy oz/st Ag, 0.006 troy oz/st Pt, and 0.005 troy oz/st Pd. During flotation tests, 92 pct of Cu, 79 pct of Ni, 76 pct of Co, and minor Au, Ag, Pt, and Pd were recovered.

Ref. Kingston and Miller, 1945; Pierce, 1946; Herreid, 1970; Barker, Thomas and Hawkins, 1985; Unpublished Bureau of Mines data.

80. Yakutat Au, Cr, PGE:
N 59° 45' 00", W 140° 00' 00"

Abundant Au (2.04-57.45 oz./st) and Pt (2.12-42.77 oz./st) reported in a non-magnetic fraction of a heavy mineral concentrates produced from beach sand in 1956.

Ref. Unpublished Bureau of Mines data.

81. Lituya Bay Au, PGE:
About N 58° 35' to N 58° 43'; W 137° 20' to W 137° 50'

Prospecting has been concentrated around auriferous beach sands northwest and southeast of Lituya Bay. Between 1894 and 1917 an estimated \$75,000 worth of gold was recovered from the area. Production since then has been negligible.

PGE are found within the auriferous sands. The source for the PGE may be a layered gabbroic dike which cuts granite on the southwestern shore of the southeastern arm of Lituya Bay. Alternatively, the source could be the mafic and ultramafic rocks in the Tertiary Crillon-LaPerouse layered gabbro complex and the similar Tertiary Mount Fairweather mafic and ultramafic pluton.

Ref. Kennedy and Walton, 1946, p. 71-72; U.S. Bureau of Mines MILS database; Alaska Division of Mining Kardex System..

82. Brady Glacier Deposit Ag, Au, Co
N 58° 32' 00", W 136° 55' 00" Cu, Ni, PGE:

Disseminated and massive sulfide segregations in the basal portion of the Tertiary Crillon-LaPerouse layered

mafic complex contain over 100 million st of proven reserves grading 0.5 pct Ni and 0.3 pct Cu. The deposit also contains minor silver, gold, cobalt and PGE. Based on analyses for 34 whole-rock samples and floatation concentrates, average Pt + Pd + Rh concentrations are 0.18 ppm in ultramafic and gabbroic rocks and 1.2 to 1.5 ppm in massive sulfide and floatation concentrates.

Ref. Rossman, 1963; Himmelberg and Loney, 1981; Czamanske and others, 1981; Unpublished Bureau of Mines data; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

83. Yakobi Island Ag, Au, Co, Cu,
N 57° 59' 00", W 136° 25' 00" Ni, PGE:

Minor silver, gold, cobalt and PGE in nickel-copper deposits at Bohemia Basin and other locations on Yakobi and Chichagof Islands. Deposits occur in Tertiary layered mafic complexes similar to, but much smaller than the Crillon-LaPerouse complex.

Ref. Pecora, 1942; Reed and Dorr, 1942; U.S. Bureau of Mines, 1945; East and others, 1948; Traver, 1948; Dahlin and others, 1981; Thornsberry, 1982; Still, 1988; Unpublished Bureau of Mines data.

84. Snettisham Ag, Au, Cu, Fe,
N 57° 58' 30", W 133° 47' 30" Ti, PGE:

Titaniferous magnetite, ilmenite, pyrite, chalcopyrite, and pyrrhotite are concentrated in veins and massive segregations in pyroxenite at the Snettisham Mine. Magnetic and floatation concentrates contain traces of silver, gold, platinum, and palladium.

Ref. Thorne and Wells, 1956; Dahlin and others, 1981.

85. Red Bluff Bay Cr, PGE:
N 56° 51' 10", W 134° 43' 40"

320 ppb Pd, 50 ppb Pt, and over 2 pct Cr occurs in dunite with disseminated chromite. Eight lenticular chromite deposits contain a total of 29,000 st with 4,000 st of contained Cr_2O_3 .

Ultramafic rocks at Red Bluff Bay are considered by some to be an Alaskan-type zoned ultramafic complex. However, observations suggest the body is not an Alaskan-type complex, including (1) abundant chromite and orthopyroxene which are both rare in zoned ultramafic complexes, and (2) the body crops out well away from the linear trend of more than 30 zoned complexes in southeast Alaska and Canada. The Red Bluff Bay ultramafic rocks are probably, instead, one of several small fault-bounded serpentized alpine ultramafic bodies on Baranof Island.

Ref. Guild and Balsley, 1942; Kennedy and Walton, 1946; Taylor, 1979; Unpublished Bureau of Mines data.

86. Snipe Bay Au, Co, Cu, Ni,
N 56° 25' 30", W 134° 58' 00" PGE:

Up to 540 ppb PGM (440 ppb Pd and 100 ppb Pt), 0.14 pct Cu, 0.32 pct Cu and 1.08 pct Ni occurs in a semimassive sulfide sample from 100-ft-wide mineralized Tertiary gabbro exposure. Identified ore minerals include chalcopyrite, pyrrhotite, pentlandite, pyrite, marcasite, siegenite, and franklinite. Diamond-drilling indicates that the deposit is smaller than the originally estimated 430,000 tons.

Ref. Loney and others, 1975; Reed and Gates, 1942; unpublished Bureau of Mines data.

87. Portage Mountain Ag, Au, Cu, PGE:
N 56° 50' 54", W 133° 15' 45"

Black pyritic schist is reported to contain about 0.4 ounce of gold, 2 ounces of silver, 0.3 ounce of copper and a trace of platinum.

Ref. Brooks and others, 1923.

88. Blashke Island Cu, Ni, PGE:
N 56° 07' 27", W 132° 54' 10"

PGE occur within sulfide-bearing marginal gabbro in zoned ultramafic complex. Analyses show traces of Pt and Pd ranging up to 0.1 troy oz/st.

Ref. Kennedy and Walton, 1946, p. 78.

89. Mount Burnett-Union Bay Cr, PGE:
N 55° 45' 43", W 132° 02' 30"

Deposits of high-iron chromite are found in fractures within dunite of the Mount Burnett zoned ultramafic complex. One outcrop with dimensions of 13 feet by 1.5 feet wide is estimated to contain about 25 tons of chromite. 0.008 oz./st Pt were detected in a sample of ultramafic rock containing secondary biotite and magnetite.

Ref. Kennedy and Walton, 1946, p. 83-86; Unpublished Bureau of Mines data.

90. Prince of Wales Island Ag, Au, Cu, PGE
90a. Salt Chuck (Goodrow Deposit)
N 55° 37' 59", W 132° 33' 30"

From 1905-1941, 20,500 troy oz Pd, 2,500 troy oz Pt, 55,250 troy oz Ag, 11,700 troy oz Au, 6,200,000 lb Cu was produced from bornite- and chalcopyrite-rich clinopyroxenite ore in a zoned ultramafic complex. PGE minerals include kotulskite [Pd(Te, Bi)] and stiblopalladinite $(\text{Pd}, \text{Cu})_5 + \text{X}(\text{Sb}, \text{As}, \text{Sn})_2\text{-X}$.

Ref. Mertle, 1921, p. 121-127; Brooks, 1921, p. 15-19; Brooks and Martin, 1921, p. 71-72; Davis, 1926; Gault, 1945; Holt and others, 1948; Clark and Greenwood, 1972; Bundtzen, 1978; pers. comm. with Geoffrey N. Goodall, Orbex Industries, Inc.; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

- 90b. Poor Man Ag, Au,
Cu, PGE?:
N 55° 33' 30", W 132° 26' 10"

Modest Copper with minor gold and silver production took place prior to 1930. No PGE data is available.

Ref. Bundtzen, 1978; Unpublished Bureau of Mines MILS database; Alaska Division of Mining Kardex

System.

90c. Rush & Brown
N 55° 37' 35", W 132° 35' 13"

Ag, Au,
Cu, PGE?:

10,194,264 lb Cu, 7,706 troy oz Au, and 87,778 troy oz Ag was produced during the period from 1904 until 1923. No PGE data is available.

Ref. Brooks, 1921, p. 15-19; Mertle, 1921, 119-121; Bundtzen, 1978; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

90d. Copper King
N 55° 33' 05", W 132° 25' 45"

Ag, Au, Cu,
Fe, PGE?:

The ore consists of greenstone in which disseminated bodies of iron and copper pyrite and magnetite occur with calcite, epidote, and some quartz as accessories. Active intermittently from 1943 through 1979. No PGE data is available.

Ref. Brooks, 1902, p. 99-100; Bundtzen, 1978; Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

91. Vickie Rose and Rita Anne
N 55° 30' 30", W 131° 29' 40"

Au, PGE:

Platinum is included in commodities for these claims.

Ref. Bureau of Mines MILS database; Alaska Division of Mining Kardex System.

92. Bokan Mountain
N 54° 55', W 132° 08'

PGE:

Silicified alkaline dike and vein systems at Bokan Mountain contain an estimated 72,000 troy oz PGE. The PGE consist predominantly of Pd.

Ref. Pers. Com. with James C. Barker, U.S. Bureau of Mines.

93. Duke Island
N 54° 55' 00", W 131° 20' 00"

PGE:

Up to 200 ppb Pt and 140 ppb Pd were detected in 22 rock samples from the Duke Island Alaskan-type complex.

Ref. Clark and Greenwood, 1972; Murry, 1972; Irvine, 1974; Unpublished Bureau of Mines data.

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