Alaska's Mineral Industry 2000

SPECIAL REPORT 55

DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
in cooperation with
Division of Community & Business Development
Division of Mining, Land & Water

Alaska's Mineral Industry 2000

by
D.J. Szumigala, R.C. Swainbank, M.W. Henning, and F.M. Pillifant

Division of Geological & Geophysical Surveys

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FRONT COVER

Jack DiMarchi explaining structures at the Liese Vein, Pogo project. The white, gold-bearing quartz vein is intruded by a steeply dipping, altered basalt dike. The Liese Vein is over 20 feet thick at this point of the underground workings. *(Photo by M.B. Werdon.)*

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EXECUTIVE SUMMARY

Alaska's Mineral Industry 2000 is the 20th in a series of annual reports produced cooperatively by the Department of Natural Resources (DNR) and Department of Community & Economic Development (DCED) through their Division of Geological & Geophysical Surveys (DGGS) and Division of Community & Business Development (DCBD), respectively.

The cumulative value of the Alaska minerals industry for the year 2000 is a record $1.28 billion, an increase of 15 percent compared with $1.12 billion in 1999, and 10 percent higher than the previous record of $1.16 billion in 1997. Of this total, $34.9 million was invested in exploration and $141.7 million in development projects. Production was valued at $1.106 billion, most of which ($981 million) came from metals.

The decline in exploration expenditures in 2000 ($34.9 million versus $52.3 million in 1999) was due in large part to the shift from exploration to development at the True North and Pogo projects and was more than offset by increased development expenditures ($141.7 million in 2000 versus $33.8 million in 1999) and the value of mineral production ($1,106.4 million in 2000 versus $1,032.9 million in 1999).

Declining mineral exploration expenditures in Alaska during 2000 mirrored worldwide trends. Approximately 50 percent of the Alaska mineral exploration expenditures for the year were in the eastern interior region. Exploration highlights include: continued thick base-metal drill intercepts reported from the Anarraaq deposit near Red Dog Mine, polymetallic mineralization discovered at the Road Metal prospect near Northway, drill testing of several prospects on the Pogo property, and lode gold mineralization intersected in drillholes at several more prospects in the Goodpaster mining district. Exploration for platinum-group element (PGE) deposits was conducted across most of Alaska, with significant PGE programs by several companies in the southcentral and southeastern regions.

Only 5,088 state mining claims were located in 2000, down 58 percent from the 11,977 reported in 1999. The 523 new federal mining claims staked in Alaska in 2000 boasted a 70 percent increase over the 308 federal claims staked in 1999. Many of the federal claims staked during this year resulted from a renewed interest in platinum-group minerals, and many prospective areas for these minerals are present in federal lands within southeastern Alaska. Approximately 1,100 new state prospecting sites were filed during 2000, down 38 percent from 1999 levels.

During 2000, core-drilling footage totaled 418,630 feet and reverse-circulation drilling footage totaled 143,118 feet. These values compare to 1999 values of 369,863 feet of core drilling and 78,934 feet of reverse-circulation drilling. Total footage drilled in 2000 was 23 percent greater than total footage drilled in 1999, even though exploration expenditures dropped sharply between 1999 and 2000. The eastern interior region had 42 percent of the total core drilling and 90 percent of the reverse-circulation drilling in Alaska during 2000.

After two slow years, development expenditures rebounded in 2000 to $141.7 million. This fourfold increase over the $33.8 million reported in 1999 reflects activity at Red Dog Mine near Kotzebue, Fort Knox Mine near Fairbanks, the Pogo property near Delta Junction, the port of Anchorage, and Greens Creek, Kensington, and A–J mines near Juneau. The True North deposit near Fort Knox Mine continued through permitting and received final permits late in the year. Cominco continued a major optimization project at the Red Dog mill. The Pogo gold project near Delta Junction advanced from exploration to development with continued drilling and drifting underground.

Total value of production from Alaska's mines and quarries in 2000 was $1,106.4 million, up 7 percent from the $1,032.9 million documented in 1999. Metals account for 89 percent of Alaska's mineral production value, followed by industrial minerals (rock, sand, and gravel) at 8 percent, and coal and peat at 3 percent. Zinc continued to be the most valuable mineral commodity produced in Alaska during 2000, followed by gold, silver, and lead. Production of sand and gravel was almost the same as in 1999, but rock production was almost double the 2.3 million tons produced in 1999, resulting from increased roadwork in southcentral and southeastern Alaska.

Red Dog zinc–lead–silver mine near Kotzebue and Greens Creek polymetallic mine near Juneau posted record production levels, while Fort Knox gold mine near Fairbanks and Usibelli Coal Mine near Healy continued producing at levels comparable to past years. Although the Nixon Fork underground gold mine remained on care and maintenance status in 2000, by mid-year the Illinois Creek open-pit gold–silver mine was in a "mining to reclaim" program. Statewide, placer gold production in 2000 continued to decline, with approximately 46,000 ounces of gold produced from 157 operations. However, overall gold production (placer and lode) increased to 551,982 ounces from 517,890 in 1999. Production of zinc and silver from the Red Dog and Greens Creek mines, respectively, set new records.

Alaska's mineral industry provided an estimated 3,183 full-time-equivalent jobs in 2000, approximately the same number of positions as the previous year. Declines in mineral exploration and placer mining jobs were offset by increased employment in mineral development.

For the first time in eight years there was no mineral-related airborne geophysical survey by DGGS in 2000. However, the U.S. Bureau of Land Management, assisted by DGGS, released results of an airborne geophysical survey of the Aniak district, which includes the 11.5-million-ounce Donlin Creek gold prospect. A team of DGGS geologists continued geologic investigations in the Fortymile area within the footprint of a 1998 airborne geophysical survey and conducted geologic mapping and geochemical sampling in the Salcha River–Pogo area within the area covered by a 1999 airborne geophysical survey.

Significant changes were made in 2000 to statutes governing location and recording of state mining claims and prospecting sites. The allowable time between location in the field and recording at the Recorder's Office was reduced from 90 to 45 days. Mining-claim law was expanded to include the option of filing a 160-acre claim.

The Department of Natural Resources presented reclamation awards in 2000 to Kvaerner Environmental, Fairbanks Gold Mining Inc., and the Alaska Department of Fish & Game's Northern Habitat Division for outstanding reclamation projects.

GOVERNOR'S FOREWORD

Thanks to record production from hardrock mines across the state, Alaska's minerals industry had another outstanding year in 2000. The total value of the industry, $1.283 billion, made this the fifth billion-dollar year in a row. Alaska's mining industry continues to be a major factor in our state's diversified economy.

Increased production from Alaska's largest mines helped offset low prices for several metals last year. Of the industry's total value of $1.283 billion, production accounted for a record $1.106 billion, of which $981 million was from metals. The year 2000 was the second in Alaska's history in which production alone topped the billion-dollar mark. Investment in exploration accounted for $34.9 million of the industry's overall value and there was a fourfold increase in investment in development projects of $141.7 million.

Record production of zinc and lead concentrates at Red Dog and Greens Creek mines in 2000 combined with higher base-metal prices and consistent gold production from Fort Knox Mine offset the continued decline in placer gold production. Mining renewed at Illinois Creek Mine near Galena under an innovative "mining to reclaim" program formulated between private industry and the State of Alaska.

Red Dog Mine near Kotzebue continues to be the world's largest producer of zinc, and the combination of growing ore reserves and development of larger ore-processing facilities ensures Red Dog's position as a world leader in zinc production for years to come. Greens Creek Mine near Juneau remains one of the largest producers of silver in the U.S. and continues to produce significant amounts of lead, zinc, and gold. Fort Knox Mine near Fairbanks is Alaska's largest gold producer, and development work at the nearby True North project indicates that the mine will continue to be Alaska's gold leader. Industrial mineral sites across the breadth of Alaska provide materials to maintain and build the vital infrastructures needed to provide services for Alaska's citizens.

Exploration for minerals continues in most areas of Alaska, albeit at lower levels than the past four years. Renewed exploration for platinum and related metals has sparked interest in prospects throughout Alaska, especially in southcentral and southeastern Alaska. Results from exploration programs near the Pogo gold property indicate that the Goodpaster region may be an emerging gold belt. Interest in Alaska's mineral wealth remains strong. The Fraser Institute, Canada's leading economic think tank, ranked Alaska among the top ten locations in the Americas and Australia for overall investment attractiveness.

In all, Alaska's mineral industry provided almost 3,200 high paying, full-time jobs for Alaskans and the State of Alaska continues to be a partner in encouraging mining development. The Division of Geological & Geophysical Surveys continued their programs to provide detailed information on Alaska's geologic framework. The Division of Mining, Land, & Water automated the process of updating mining information in the State's computer systems and simplified the process of paying annual rental fees on mining claims. Statutes governing the location and recording of state mining claims and prospecting sites were changed, in consultation with the mining industry, to reduce costs associated with recording and managing mining claim information.

The year 2000 continued to be a healthy one for Alaska's mining industry and the State of Alaska looks to continue its support and encouragement for this important sector of Alaska's economy.

Governor Tony Knowles

COMMISSIONERS' FOREWORDS

The 2000 millennium year was particularly notable in the minerals industry, marked by record financial investments, record production by long-lived mines, and new exploration.

I am pleased to report that Alaska's mineral industry set a new record in 2000 with the total value of investment and production reaching $1.28 billion. Recent exploration in western Alaska has identified a number of additional world-class mineral prospects of gold and copper that offer strong potential for the future. Coupled with record production of zinc near Kotzebue and polymetallic ore near Juneau and steady production of gold and coal in the interior of the state, this is good news for our mining companies and good news for our residents.

Alaska recognizes the importance of mining to our state. This key industry provides employment for our people and serves as an economic engine—particularly in rural areas of the state—where the need for jobs is greatest and diversification is challenging. My department provides advocacy in mineral exploration and development by supplying general information, economic data, and technical assistance. In addition, we extend a welcome to companies and individuals seeking to do business in Alaska and we serve as a liaison to those who are already benefiting from Alaska's rich mineral resources.

Mining will always be a cyclical industry, impacted by the fluctuations in worldwide metal prices. But we are confident that with Alaska's existing reserves, new world-class prospects, and our long-lived mines, Alaska is poised for a bright mining future.

Deborah B. Sedwick, Commissioner, Department of Community & Economic Development

Despite continued low prices for most metals, particularly the price of gold, Alaska's mining industry continued to show strength and figure prominently in Alaska's economy.

The value of production from Alaska's mining industry set a record at $1.28 billion. This was 15 percent higher than the previous year, a result of production increases and successful implementation of mine expansions. Alaskans should be encouraged that the year 2000 was the fifth year in a row the mining industry has eclipsed the $1 billion mark in total value.

Placer miners felt the brunt of low gold prices, with their production continuing a downward trend in 2000. Nonetheless, overall gold production continued its upward trend with almost 552,000 ounces produced statewide in 2000, which is 6.5 percent more than in 1999.

Investments in project developments, which were significantly higher than in 1999, are a reflection on exploration success in past years as well the ongoing efforts of DNR to coordinate and advance the permits for large mine projects in the state. In 2000, this included issuing the permits for Fairbanks Gold's True North deposit and working with industry to formulate an innovative "mining to reclaim" arrangement at Illinois Creek.

Although exploration expenditures of $33.9 million in 2000 were down by about one-third compared to 1999, Alaska continues to hold the interest of the international mining industry due to the potential for discovering and permitting large, high-grade mineral deposits. With the competition for the limited mineral exploration dollars tightening worldwide, Alaska is committed to continuing its efforts to be viewed as a desirable location for the industry.

DNR's efforts to update and streamline the State's mining claim laws took effect in the year 2000. Claims can now be more quickly and easily recorded through DNR's recorder's offices throughout the state, plotted on status plats, and accessed by the public within a few weeks of recording.

The claim-staking activities demonstrated there continues to be particular interest in the area around the high-grade Pogo gold deposit near Delta Junction and in platinum-group metals potential in the southeastern and interior regions of the state.

The future remains bright for Alaska's mineral industry and DNR stands ready to continue to encourage this vital industry for Alaska.

Pat Pourchot, Commissioner, Department of Natural Resources

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Alaska's Mineral Industry 2000

D.J. Szumigala,[1] R.C. Swainbank,[2] M.W. Henning,[3] and F.M. Pillifant[4]

INTRODUCTION

This summary of the year 2000 Alaska mineral industry is made possible by information provided through phone interviews, replies to about 1,050 questionnaires sent to the mineral industry and compiled by the Alaska Division of Geological & Geophysical Surveys (DGGS), press releases, and other information sources. Funds for printing the report are provided by the Division of Community & Business Development (DCBD) in the Department of Community & Economic Development (DCED). This report is part of a cooperative venture between DGGS in the Department of Natural Resources (DNR), the DCBD, and the Division of Mining, Land & Water (DMLW) of DNR. This report for the 2000 calendar year is the 20th of the series.

Figure 1 and table 1 show the estimated value of the mineral industry for each year since 1981, divided into exploration and development investment, and the value of the mined products. As usual, we rely on company information to define the exploration and development parameters. Average metal prices are calculated from the weekly average spot prices on the London Metal Exchange, and are used to calculate the value of production. These values do not take into account the costs of mining or transportation, or smelter charges and penalties.

Table 1. *Total value of the mineral industry in Alaska by year (in millions of dollars)*

	Exploration (expenditure)	Development (expenditure)	Production (value)	Total (calculated)
1981	76.3	24.7	188.6	289.6
1982	45.6	41.6	196.4	283.7
1983	34.1	27.9	212.4	274.4
1984	22.3	53.4	199.4	275.1
1985	9.2	34.1	226.6	269.9
1986	8.9	24.3	198.5	231.7
1987	15.7	100.3	202.4	318.4
1988	45.5	275.0	232.2	552.6
1989	47.8	134.3	277.0	459.0
1990	63.3	14.3	533.0	610.6
1991	39.9	25.6	546.5	612.0
1992	30.2	29.6	560.8	620.6
1993	30.3	27.7	448.7	506.7
1994	31.1	45.0	507.5	583.6
1995	34.3	148.6	537.2	720.1
1996	44.7	394.0	590.4	1029.2
1997	57.8	168.4	936.2	1162.4
1998	57.3	55.4	921.2	1033.9
1999	52.3	33.8	1032.9	1119.1
2000	34.9	141.7	1106.4	1283.0
TOTAL	**$781.5**	**$1,799.4**	**$9,654.3**	**$12,235.20**

SOURCE: Alaska's mineral industry reports published annually by DGGS.

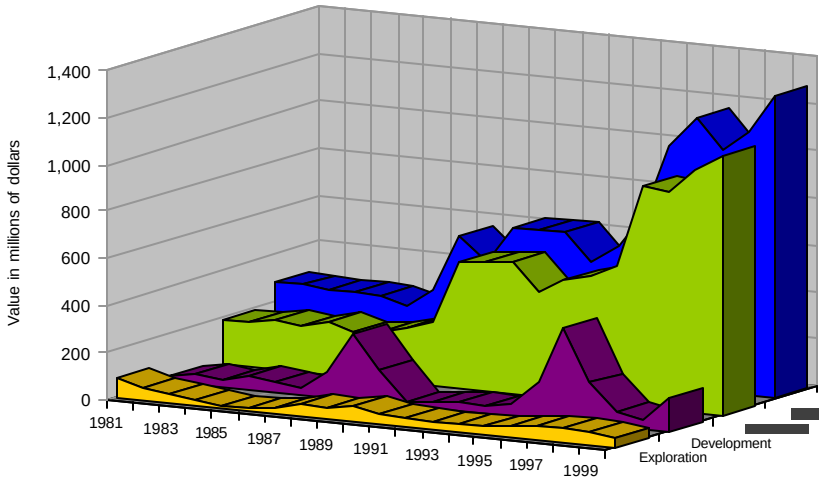

Figure 1. *Alaska's mineral industry total value, 1981-2000.*

[1]Alaska Division of Geological & Geophysical Surveys, 794 University Avenue, Suite 200, Fairbanks, Alaska 99709-3645.
[2]Alaska Division of Community & Business Development, Unit #7, 3677 College Road, Fairbanks, Alaska 99709-3732.
[3]Alaska Division of Mining, Land & Water, 550 W. 7th Avenue, Suite 900B, Anchorage, Alaska 99501-3577.
[4]Alaska Division of Community & Business Development, PO Box 110809, Juneau, Alaska 99811-0809.

The 2000 cumulative value of the Alaska minerals industry is a record $1.283 billion, an increase of 15 percent compared with $1.119 billion in 1999. The decline in exploration in 2000, $34.9 million versus $52.3 million in 1999, was in large part due to the shift from exploration to development at the True North and Pogo projects, and was more than offset by increased development expenditures ($141.7 million in 2000 versus $33.8 million in 1999), and in the value of mineral production of $1,106.4 million in 2000 versus $1,032.9 million in 1999.

Mining companies sometimes report in metric units, but this report uses only U.S./English units. A conversion table is included as Appendix G. In some instances values are reported as parts per million or billion, reflecting industry standards. Whenever possible, values for gold and silver have been translated to ounces per ton, unless the translation would render the numbers insignificant.

Companies spent $34.9 million on mineral exploration in Alaska in 2000; about 51 percent of that total was spent in the eastern interior region. Exploration highlights include continued thick base-metal drill intercepts reported from the Anarraaq deposit near the Red Dog Mine, significant platinum-group element (PGE) programs by several companies conducted in the southcentral and southeastern regions of Alaska, polymetallic mineralization discovered at the Road Metal prospect near Northway, Alaska, and lode gold mineralization encountered at several more prospects in the Goodpaster mining district. The Pogo deposit advanced toward the development phase and other prospects on the Pogo property were drill tested.

The True North deposit near Fort Knox Mine continued through the permitting stage and received final permits late in the year. Cominco continued a major optimization project at the Red Dog mill. The Red Dog zinc–lead–silver mine near Kotzebue and the Greens Creek polymetallic mine near Juneau posted record production levels, while the Fort Knox gold mine near Fairbanks and Usibelli Coal Mine near Healy continued producing at levels comparable to past years.

Although placer gold production in 2000 continued to decline, overall gold production increased to 551,982 ounces from 517,890 in 1999, and production of zinc and silver from the Red Dog and Greens Creek mines set a new record.

EMPLOYMENT

The estimated total employment by the Alaska mineral industry in 2000 was 3,183 full-time-equivalent jobs (table 2; fig. 2). This is an increase of 17 jobs (0.5 percent) from the 3,166 jobs in 1999. There was a decline of 121 jobs in placer mining and 100 jobs in exploration in 2000 compared with 1999, but an increase of 210 jobs in mineral development. Most other categories were similar in both years. It is anticipated that with low gold prices and high fuel prices the decline in placer mining employment will continue, but that employment in hard rock gold mining will offset these losses.

ACKNOWLEDGMENTS

This report on the Alaska mineral industry is designed to provide current, accurate, and technically reliable information. The authors wish to thank all companies, agencies, and individuals who responded to questionnaires or phone calls and provided information about their activities and operations. Without your voluntary and timely information this report would not be possible.

Table 2. *Estimated Alaska mine employment, 1994–2000*[a]

	1994	1995	1996	1997	1998	1999	2000
Gold/silver mining							
Placer	1,150	975	825	780	710	591	470
Lode	- -	38	138	415	345	296	274
Polymetallic	- -	- -	68	230	275	275	275
Base metals	311	397	407	478	466	549[b]	556
Recreational	280	255	260	270	255	240	250
Sand & gravel	640	577	598	700	658	590	603
Rock	210	200	149	123	121	128	150
Coal	115	120	115	118	128	121	121
Peat	55	30	38	42	40	38	36
Tin, jade, soapstone, ceramics, platinum	25	20	20	20	20	20	20
Mineral development	115	637	862	409	177	135	345
Mineral exploration	182	157	257	277	282	183	83
TOTAL	**3,083**	**3,406**	**3,737**	**3,862**	**3,477**	**3,166**	**3,183**

[a]Calculated on a 260-day work year.
- - Not reported.

DGGS mailed approximately 1,050 questionnaires in November of 2000, and received 157 replies. Dave Szumigala (DGGS) and Dick Swainbank (DCBD) prepared the body of the text, tables, and appendices with the assistance of Mitch Henning (DMLW) and Frankie Pillifant (DCBD).

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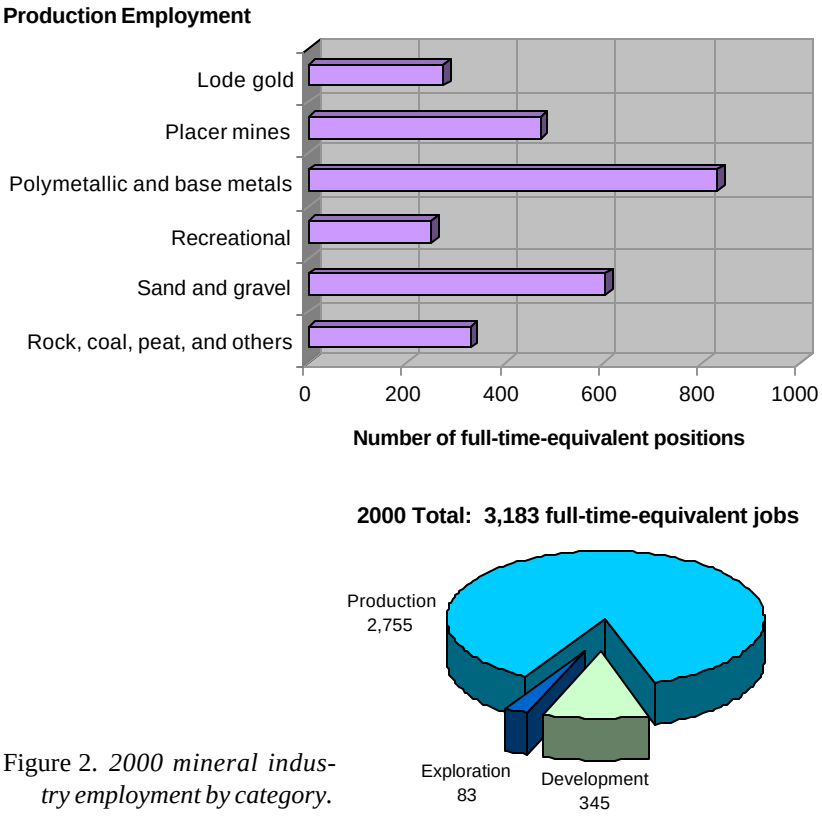


Figure 2. *2000 mineral industry employment by category.*

EXPLORATION

Worldwide, exploration spending declined approximately 7 percent from 1999 levels, according to the 11th edition of Metal Economics Group's Corporate Exploration Strategies. Alaska seems to have had a similar decline, approximately 5 percent, when other factors are considered. Although the estimated exploration investment of $34.9 million in 2000 was down 33 percent from the $52.3 million spent in 1999 (table 1), most of the decline resulted from the fact that activity at the Pogo mine site near Delta and also at True North near Fairbanks was considered to be development, rather than exploration.

Figure 3 shows the regions of the state used in this and subsequent sections. Expenditures and employment figures by commodity and region are listed in table 3. Exploration expenditures in Alaska by commodity for the past 19 years are listed in table 4. Tables 3 and 4 show the regional

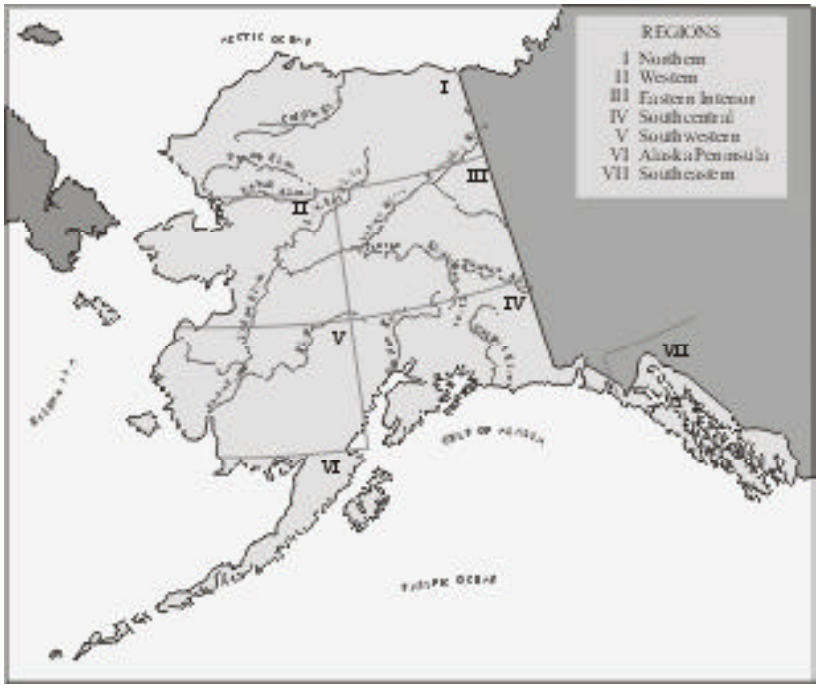


Figure 3. *Regions of mineral activity in Alaska as described in this report.*

Table 3. *Reported exploration expenditures and employment in Alaska, 2000*

	Northern	Western	Eastern interior	South-central	South-western	South-eastern	Total
			Exploration expenditures				
Placer	$ 24,600	$ 51,000	$ 250,600	$ 191,300	$ 11,000	$ - -	**$ 528,500**
Lode	8,496,800	1,060,000	17,507,300	1,483,500	2,151,200	3,624,300	**34,323,100**
TOTAL	**$8,521,400**	**$1,111,000**	**$17,757,900**	**$1,674,800**	**$2,162,200**	**$3,624,300**	**$34,851,600**
			Exploration employment				
Employment							
Workdays	705	3,531	10,532	3,566	2,457	741	**21,532**
Workyears[a]	2.7	13.6	40.5	13.7	9.5	2.9	**83**
Number of companies reporting[b]	5	15	68	31	10	17	**129**

- - Not reported.
[a]Based on 260-day workyear.
[b]Some companies were active in several areas.
No exploration expenditures or employment reported for Alaska Peninsula in 2000.

distribution and the commodities sought, and figure 4 is a graphic from table 4. Selected significant exploration projects in Alaska during 2000 are shown in figure 5. There were no reported mineral exploration expenditures for the Alaska Peninsula region during 2000.

Although only 5,611 mining claims were located in 2000 (table 5), down 54 percent from the 12,285 reported in 1999, many of the most prospective areas of recent exploration had been acquired either by claims or prospecting sites in the previous three or four years. New federal mining claims staked in Alaska during 2000 numbered 523—a 70 percent increase from the 308 federal claims staked in 1999. Many of the federal claims staked in 2000 were due to a renewed interest in platinum group minerals and many prospective areas for these minerals are present in federal lands within southeast Alaska. Approximately 1,100 new state prospecting sites were filed during 2000, down 38 percent from 1999 levels.

NORTHERN REGION

Cominco American Inc., a wholly owned subsidiary of Cominco Ltd., continued exploration in the area around Red Dog Mine. The western Brooks Range region has the world's largest known zinc resources, estimated at 25 million tons of zinc, in four deposits near Red Dog. Four out of the eight largest known zinc deposits in the world are located in the Red Dog area. The zinc resource number does not include resources at the Su-Lik and Anarraaq deposits. The second-largest area with known zinc resources, in Australia, contains an estimated 17 million tons of zinc.

Cominco conducted gravity surveys on their land package of state mining claims and NANA Regional Corp.-owned lands. Previous gravity work had outlined several large anomalies comparable in size to Anarraaq, as well as several smaller, intense anomalies. Drilling of the Anarraaq deposit resumed in early June and the eastern and southwestern margins of the deposit were defined by the drilling. Seven of the 16 holes completed in the Anarraaq area during 2000 were considered barren. Six holes had zinc ore intercepts ranging from 11 to 65 feet thick. Three holes had ore intercepts greater than 100 feet thick. Hole 923 intersected a 197-foot interval (180 feet of true thickness) beginning at 2,208-foot depth averaging 20 percent zinc, 6 percent lead, and 4.0 ounces per ton silver. Hole 933 had a 202-foot-thick intercept starting at 2,202-foot depth with average grades of 16 percent zinc, 5 percent lead, and 3.1 ounces per ton silver. Hole 946 had a 118-foot-thick intercept beginning at 2,080-foot depth with average grades of 14 percent zinc, 4 percent lead, and 1.9 ounces per ton silver. Ore at the Anarraaq deposit seems to have higher iron content than ore from the Red Dog Mine. Cominco estimated that there are a billion tons of barite overlying the sulfide mineralization at the Anarraaq deposit. Inferred ore reserves for the Anarraaq deposit and ore reserves for the other ore bodies near Red Dog Mine are listed in table 6.

Quaterra Resources Inc. targeted mafic and ultramafic rocks in the Asik Mountain area about 35 miles north of Kotzebue and 45 miles south of Red Dog Mine for a platinum-group-element exploration program. Quaterra's interest in Asik Mountain was triggered by a 1991 publication with reported analyses from six samples taken in the north-central part of the ultramafic complex ranging from 510 to 1,605 parts per billion platinum and 480 to

Table 4. *Reported exploration expenditures in Alaska by commodity, 1982–2000*

	Base metals	Polymetallic[a]	Precious metals	Industrial minerals	Coal and peat	Other	Total
1982	$31,757,900	$ N/A	$ 10,944,100	$ - -	$ 2,900,000	$ 15,300	**$ 45,617,300**
1983	9,758,760	N/A	20,897,555	2,068,300	1,338,454	70,000	**34,133,069**
1984	4,720,596	N/A	14,948,554	270,000	2,065,000	279,500	**22,283,650**
1985	2,397,600	N/A	6,482,400	- -	270,000	- -	**9,150,000**
1986	1,847,660	N/A	6,107,084	170,000	790,000	- -	**8,914,744**
1987	2,523,350	N/A	11,743,711	286,000	1,150,000	31,000	**15,734,061**
1988	1,208,000	N/A	41,370,600	160,200	2,730,000	- -	**45,468,800**
1989	3,503,000	N/A	43,205,300	125,000	924,296	5,000	**47,762,596**
1990	5,282,200	N/A	57,185,394	370,000	321,000	97,000	**63,255,594**
1991	4,789,500	N/A	34,422,039	92,000	603,000	2,000	**39,908,539**
1992	1,116,000	3,560,000	25,083,000	25,000	425,000	- -	**30,209,000**
1993	910,000	5,676,743	23,382,246	163,500	- -	125,000	**30,257,489**
1994	600,000	8,099,054	18,815,560	225,000	2,554,000	810,000	**31,103,614**
1995	2,770,000	10,550,000	20,883,100	100,000	- -	3,000	**34,306,100**
1996	1,100,000	11,983,364	31,238,600	400,000	- -	- -	**44,721,964**
1997	1,700,000	22,347,000	32,960,500	80,000	720,000	- -	**57,807,500**
1998	1,000,000	13,727,000	42,441,000	12,000	87,000	- -	**57,267,000**
1999	3,869,000	3,168,000	44,891,000	1,000	- -	410,000	**52,339,000**
2000	8,545,000	3,933,000	21,579,000	58,500	- -	736,100	**34,851,600**
TOTAL	**$89,398,566**	**$83,044,161**	**$508,580,743**	**$4,606,500**	**$16,877,750**	**$2,583,900**	**$705,046,620**

[a]Polymetallic deposits considered as a separate category for the first time in 1992.
N/A = Not available.
- - Not reported.

1,112 parts per billion palladium. Quaterra consultants completed reconnaissance mapping and sampling of the area during late August. A total of 106 rock, soil, and stream-sediment samples were collected and analyzed. The maximum values obtained were 450 parts per billion palladium in a gabbro and 195 parts per billion platinum in a troctolite. The ultramafic body was discovered to be significantly larger than previously mapped and could contain rocks with higher platinum–palladium values. Sample results are sufficiently encouraging to warrant further fieldwork next year if suitable arrangements can be worked out with NANA Regional Corp.

Silverado Gold Mines Ltd. drilled portions of Nolan Creek during exploration for additional gold placer resources and may have encountered a virgin stretch of the Nolan deep channel in two drill holes. Silverado's drilling, geophysical, and geological evidence suggests that the ancient deep channel is at least several hundred feet west of a line of drift shafts sunk prior to 1920.

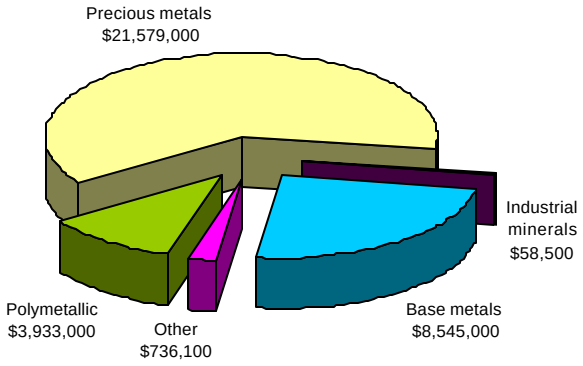


Figure 4. *2000 exploration expenditures by commodity.*

WESTERN REGION

Consolidated Aston Resources Ltd. completed an extensive exploration program on the Mt. Distin project during 2000. Exploration included geologic mapping, rock chip sampling, conventional and mobile-metal-ion (MMI) soil sampling, and approximately 1,640 feet of core drilling. Mapping, soil sampling, and drilling on the Bulk Gold property (under lease from Altar Resources) discovered two stratiform, disseminated, sericite–pyrite–arsenopyrite–stibnite mineralized zones and a new fault zone with strong soil geochemical anomalies (up to 0.034 ounces per ton gold, 442 parts per million arsenic, and 393 parts per million antimony). MMI sampling on portions of the Lost and Midas Well claim blocks identified two large areas of gold anomalies warranting additional work. Consolidated Aston drilled three core holes at the Grouse Creek prospect and three core holes at the Big Pig prospect on the Bulk Gold property. The best drill results were from DDH

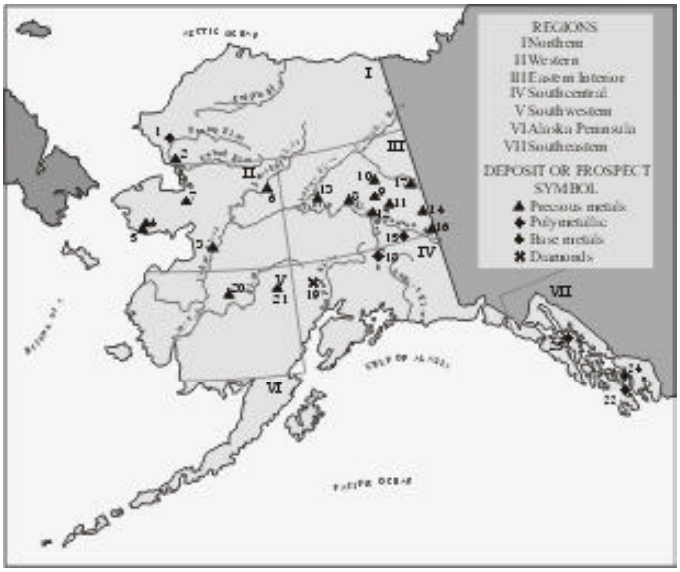
BG–1, a 284-foot hole that intersected an intensely brecciated, stibnite-cemented, dolomitized massive marble bed with disseminated gold and antimony mineralization from the collar to 67-foot depth. Assay results include a 48-foot-thick zone averaging 0.017 ounces per ton gold from 10 feet to 58 feet, including 15 feet averaging 0.03 ounces per ton gold. Maximum metal values in the Grouse Creek drillholes were 0.008 ounces per ton gold, 4,172 parts per million arsenic, and 117 parts per million antimony.

NovaGold Resources Inc. continued its assessment of the Rock Creek property near Nome. Two main ore types were selected for bench and pilot-scale metallurgical tests. Shear vein mineralization consisting of pyrite, arsenopyrite, and sulfosalt minerals in quartz and clay gouge averaged 90.7 percent recovery using cyanide and 37.4 percent of the gold was recovered in a gravity concentrate at a minus 65-mesh grind. Tension vein mineralization consisting of free gold in quartz with pyrite–arsenopyrite selvages averaged 98.1 percent recovery using cyanide and 86.2 percent of the gold was recovered in a gravity concentrate. NovaGold also conducted an extensive reverse-circulation drilling program during 2000. Drilling highlights are: 100 feet averaging 0.125 ounces per ton gold (hole RR–011); 100 feet averaging

I Northern Region
1. Red Dog Mine/District—Cominco Alaska Inc.
2. Asik Mtn.—Quaterra Resources Inc.

II Western Region
3. Nome area—NovaGold Resources Inc.
4. Mt. Distin—Consolidated Aston Resources Ltd.
5. Kaiyah—North Star Exploration Inc.
6. Indian River—North Star Exploration Inc.
7. Dime Creek—Platinum–Palladium Holdings Inc.

III Eastern Interior Region
8. Fairbanks district
   a. Fort Knox—Kinross Gold Corp.
   b. Gil claims—Kinross Gold Corp./Teryl Resource Corp.
   c. General—Kinross Gold Corp.
   d. Golden Summit—International Freegold Mineral Development Inc.
9. Salcha River area—NovaGold Resources Inc., Barrick Gold Corp.
10. Circle district—Newmont Exploration Ltd.
11. Pogo—Goodpaster mining district
    a. Pogo—Teck Corp./Sumitomo Metal Mining America Inc.
    b. East Divide—International Bravo Resource Corp.
    c. Boundary & Southeast Surf—Western Keltic Mines Inc./Rimfire Minerals Corp./Barrick Gold Corp.
    d. Eagle—Hyder Gold Inc./Rimfire Minerals Corp.
    e. Black Mountain—Sumitomo Metal Mining America Inc.
    f. Ogopogo—Copper Ridge Exploration Inc.
    g. Pogo/Goodpaster area—Numerous companies
12. Richardson district/Uncle Sam area—Kennecott Exploration Co., Placer Dome Exploration Inc., Tri-Valley Corp.
13. Delta Mineral Belt—Grayd Resource Corp., Inmet Mining Corp.



14. Fortymile district (Napoleon project and general)—Teck Corp./Kennecott Exploration Co., Ventures Resource Corp.
15. Elephant Mountain, Tofty/Manley—North Star Exploration Inc.
16. Road Metal—North Star Exploration Inc.
17. Flanders—Ventures Resource Corp.

IV Southcentral Region
18. Nikolai Mafic–Ultramafic Belt—M.A.N. Resources Inc./Nevada Star Resource Corp., International Freegold Mineral Development Inc., Latitude Minerals Corp.
19. Shulin Lake—Shear Minerals Ltd./Shulin Lake Mining Inc.

V Southwestern Region
20. Donlin Creek—Placer Dome Exploration Inc.
21. Farewell— Platinum–Palladium Holdings Inc.

VI Alaska Peninsula Region

VII Southeastern Region
22. Salt Chuck—Santoy Resources Ltd.
23. Greens Creek—Kennecott Minerals Co./Hecla Mining Co.
24. Union Bay—International Freegold Mineral Development Inc.

Figure 5. *Selected exploration projects in Alaska, 2000.*

Table 5. *Summary of claim activity, 1991–2000*

Year	State Claims New	State Claims Total (Active)	State Prospect Sites New	State Prospect Sites Total (Active)	Federal New	Federal Total (Active)
1991	3,277	38,485	747	1,735	1,299	23,222
1992	2,650	36,947	454	1,490	695	20,254
1993	2,110	34,908	1,412	2,281	601	9,298
1994	4,064	35,184	810	2,449	341	8,495
1995	4,508	31,796	1,030	2,850	376	7,766
1996	9,495	37,843	2,082	3,735	681	9,346
1997	8,671	43,968	2,480	5,334	1,872	11,320
1998	9,786	50,464	3,187	7,278	427	11,033
1999	11,977	56,673	1,740	7,639	308	10,176
2000	5,088	54,983	1,077	5,641	523	10,000*

Federal claims = 20 acres, State claims = 40 acres or 160 acres, State prospecting sites = 160 acres.
Information provided by John Cacy (Land Records Information Section, DNR) and Evvie Garis (USBLM). Table has been reorganized to conform with computer records available after 1990.
*Estimate.

0.079 ounces per ton gold, including 45 feet averaging 0.13 ounces per ton gold (hole RR–002); 95 feet averaging 0.15 ounces per ton gold (hole RR–015); and 90 feet averaging 0.087 ounces per ton gold, including 30 feet averaging 0.175 ounces per ton gold and 25 feet averaging 0.25 ounces per ton gold (hole RR–003). The 30-hole, phase 1 drill program was designed to increase drillhole density to a 100-foot by 300-foot grid pattern. Drilling indicated that mineralization continues to the south of previously known extents.

Quaterra Resources Inc. staked seven 160-acre state mining claims at the Big Bar prospect about 110 miles northeast of Nome on the Seward Peninsula for potential volcanogenic massive sulfide mineralization. Anaconda Minerals Co. identified the prospect in 1982 and completed mapping, soil sampling, and limited ground geophysics (magnetics, gravity, induced polarization [IP], MaxMin and electromagnetics [EM]) before dropping the claims without drilling in 1985. The few completed lines of geophysics identified an IP anomaly with a coincident magnetic high upslope from a copper anomaly. A large geochemical anomaly, favorable host rocks, deep weathering and gossan fragments are all positive indicators.

RPG Ltd, a wholly owned subsidiary of Altar Resources, was granted an exploration license to the Golden Peninsula property owned by Bering Straits Native Corp. This property, near Nome, has historic placer gold production. RPG conducted a panning program across the property and identified five areas with strong lode gold potential.

North Star Exploration Inc. completed 2,776 feet of core diamond drilling in four holes at the Kaiyah epithermal silver–gold deposit immediately west of the Yukon River, and one hole at the SC 'sinter' state prospecting sites near the center of the Poison Creek caldera. Drilling explored subsurface extensions of two major east–west-trending vein systems: (1) the "Main" vein at VABM Kaiyah; and (2) the "South" vein, which outcrops about 250 yards south of Kaiyah summit. All four holes intersected classic epithermal mineralization with advanced argillic alteration, polymodal quartz vein swarms, and locally abundant polymetallic sulfides. Drilling also encountered several large, mineralized dikes that cut the layered rock section. A significant narrow intercept (0.077 ounces per ton gold and 0.58 ounces per ton silver over two feet) was present in hole KAI–00–04. Several zones of argillic alteration, sulfides, and polymodal quartz vein swarms encountered anomalous gold, silver, copper, arsenic, antimony, and lead values in drill hole 2.

North Star, in an option agreement with Doyon Ltd., also drilled two holes totaling 1,091 feet on a prospect in the Indian River Trend (IRT) mineralization, about 20 miles east–northeast of the village of Hughes (fig 6). The drill program was designed to test an east–west-trending zone of high-level felsic intrusive rocks with significant indications of gold–polymetallic mineralization. Chalcopyrite and pyrite were found throughout much of the core and associated alteration minerals may include gypsum.

Platinum–Palladium Holdings Inc., the newly formed subsidiary of North Star Exploration Inc., focused platinum-group elements (PGE) exploration in the Rampart–Livengood districts of interior Alaska, the Farewell district of the western Alaska Range, and the Dime Creek/Koyuk district of the eastern Seward Peninsula. PGEs were recovered in the Dime Creek region from streams draining bedrock similar to bedrock that hosts PGE

Table 6. *Red Dog ore reserves*[a]

	Tons (millions)	Zinc (wt%)	Lead (wt%)	Silver (oz/ton)
Main (Proven)	46.2	19.2	5.2	2.92
Aqqaluk (Probable, Indicated, Inferred)	73.0	15.2	4.0	2.17
Qanaiyaq[b] (Indicated)	10.6	17.8	5.5	3.41
Paalaaq (Inferred)	14.3	15.0	4.0	2.63
Anarraaq (Inferred)	19.0	15.8	4.8	2.07
Total/*Average*	**163.1**	***16.6***	***4.5***	***2.48***

[a]As of December 31, 2000 from Cominco 2000 Annual Report.
[b]Qanaiyaq was previously referred to as Hilltop.

deposits in the Russian Far East. Plutonic complexes with ultramafic components intruded a major suture that separates two tectonostratigraphic terranes. Platinum–Palladium Holdings conducted a reconnaissance program and located platinum in pan concentrates in two drainages. Platinum grains, and up to several hundred grains of gold, were found in pan concentrates from three locations in the drainage system. Approximately 35 mafic and ultramafic rock samples were collected for analysis. Results of pan concentrate sampling included values up to 0.07 and 0.12 ounces per ton platinum and 1.31 and 1.39 ounces per ton gold.

Platinum–Palladium Holdings Inc. reported ore grade levels of PGEs in two target types from the Farewell property: (1) sill-form differentiated mafic–ultramafic intrusions, related to the Triassic Nikolai terrane at the Roberts prospect, and (2) differentiated composite plutons with mafic–ultramafic components at the Chip-Loy prospect. Platinum–Palladium conducted a reconnaissance field program in the 2000 field season and located significant platinum and palladium (up to 0.058 ounces per ton platinum–palladium) at the Roberts PGE prospect. A total of three target areas are held under Alaska state claims and prospecting sites. At Farewell, a sulfide-rich, copper-stained, 25–35-foot-thick, shallow-dipping mafic sill outcrop (a dark, lenticular intrusion) was traced and sampled over a distance of 1,500 feet. Of the twenty-seven 3- to 8-foot rock chip samples taken from outcrop and rubble crop exposures, 17 samples contained 0.005 to 0.058 ounces per ton combined platinum and palladium as well as up to 0.48 percent copper, 117 parts per million cobalt, and 0.48 percent nickel. Sampling of another mafic intrusion 2.5 miles farther to the south yielded high copper–cobalt–nickel values including 0.001 ounces per ton detectable combined PGE in one sample.

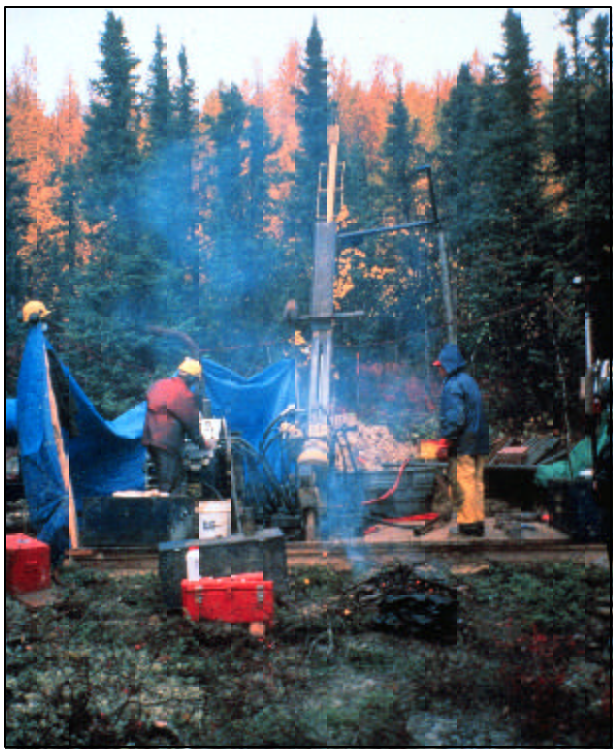


Figure 6. *First drillhole on North Star's IRT property. Drilling by Major Alaska Drilling Inc. Photo provided by T.K. Bundtzen.*

EASTERN INTERIOR REGION

The eastern interior region of Alaska experienced about 51 percent of the total mineral exploration expenditures in 2000, continuing a trend developed over the last few years. The most active areas of Alaska's interior were the Fairbanks mining district and the Goodpaster mining district.

Kinross Gold Corp. and Teryl Resources Corp. completed an extensive drill program on the Gil claims near Fairbanks through a joint venture agreement. Kinross Gold has an 80 percent working interest in the Gil joint venture and the Gil claims are adjacent to Fort Knox Mine, owned by Kinross Gold Corp. Mineralization at the Main Gil prospect is in excess of 2,500 feet along strike and has been drill tested to a depth of 600 feet. Mineralization is primarily stratabound within a metamorphic package and is hosted in two or possibly three calc–silicate horizons. Mineralization at the North Gil prospect is primarily as quartz veining within the metamorphic rock package.

Kinross's 45,530-foot drill program consisted of 33 core holes for a subtotal of 15,762 feet and 95 reverse-circulation (RC) drill holes for a subtotal of 29,768 feet (fig. 7). The program's goal was to test the expansion of the Main Gil Zone, define a resource on the North Gil prospect, and to test other geochemical and geophysical targets. In the Phase 1 drill program, 21 drill holes intersected significant gold mineralization. Phase 2 drilling concentrated on in-fill and step-out drilling at both the North Gil and the Main Gil zones. Selected Main Gil prospect gold drill intercepts include 80 feet of 0.036 ounces per ton, 105 feet of 0.04 ounces per ton, 15 feet of 0.176 ounces per ton, 120 feet of 0.045 ounces per ton, 65 feet of 0.12 ounces per ton, and 50 feet of 0.065 ounces per ton. Selected North Gil prospect gold drill intercepts include 110 feet of 0.1217 ounces per ton, 65 feet of 0.1237 ounces per ton, 50 feet of 0.035 ounces per ton, 40 feet of 0.24 ounces per ton, 20 feet of 0.15 ounces per ton, and 15 feet of 0.33 ounces per ton. One drill hole at the Slippery Creek prospect intersected 15 feet of 0.027 ounces per ton gold.

Kinross also worked on a number of other projects throughout the Fairbanks area. Work continued on evaluating the Ryan Lode property on Ester Dome, with extensive drilling to test previously defined gold and silver resources. Kinross also conducted a drilling program

on the Amanita property south of Fort Knox Mine and the Steamboat Creek property between True North and Fort Knox. Kinross also conducted metallurgical tests and remediation work at the Ryan Lode property.

International Freegold Mineral Development Inc. (Freegold) drilled one core hole to a 1,000-foot depth on the Cleary Hill mine prospect within its Golden Summit project area of the Fairbanks mining district. The purpose of this program was to test for both high-grade vein occurrences and bulk-tonnage gold mineralization in surrounding country rock. Hole CHD00–1, to the south of the Wyoming vein, intercepted a new significant gold-bearing zone. Based on historical surface and subsurface data, the newly discovered zone (218–282 feet), named the Currey Zone, strikes east–west, has a moderate south dip and a true thickness of approximately 63 feet. The Currey Zone projects to the surface approximately 220 feet north of the collar of hole CHD00–1. There is no known surface expression of the Currey Zone. Strong pervasive quartz veining and flooding, pervasive sericite alteration, and polyphase hydrothermal brecciation mark gold mineralization in the Currey Zone. Gold mineralization averages 0.143 ounces per ton over the 64-foot intercept. Anomalous gold values are associated with highly anomalous arsenic and antimony with lesser lead and silver. Fragments of previously altered and quartz-veined intrusive rock are present in the core and suggest a possible igneous genetic relationship at depth. Several other greater than 0.03 ounces per ton gold intervals were intercepted in hole CHD00–1, including 2 feet grading 2.5 ounces per ton at 520 feet from a sulfide- and sulfosalt-bearing quartz vein. This 2-foot intercept correlates with the downdip extension of either the "J" vein or the Colorado vein, neither of which have been intercepted in previous drilling.

Many properties were staked in 1998 and 1999 in the rush to acquire a land position near the Pogo property. Low gold prices hindered junior mining companies from raising venture capital to explore these claims. However, several companies were able to raise funds for exploration during 2000. These exploration programs advanced some properties to the drilling phase of exploration. Gold mineralization was encountered during drilling at several properties. Results of the drilling are significant because they indicate that potential gold mineralization is more widespread than in the immediate area surrounding the Pogo property.

Teck Corp. and partner Sumitomo Metal Mining America Inc. conducted extensive exploration on the Pogo property in the Goodpaster mining district east of Fairbanks. Teck and Sumitomo have outlined 5.6 million ounces at the Pogo gold deposit and the main occurrence was advanced to development status. Exploration work continued on other parts of the 72-square-mile property. The summer surface exploration program included more than 25,000 feet of core drilling at other prospects. Recent work by Teck intersected gold mineralization during exploration drilling along the 8-mile-long Pogo Trend. Drilling at Hill 4021 totaled 11,200 feet, tested 3,000 feet of strike length, and encountered gold mineralization, including 15.5 feet of 0.71 ounces per ton gold.

International Bravo Resource Corp. completed exploration on the East Divide, West Pogo, and Central properties held under option from a subsidiary company of North Star Exploration Inc. The East Divide property is approximately 16 miles southeast of Teck's Pogo gold prospect and was the site of most of Bravo's work. The East Divide property features an intrusion-hosted, structurally controlled, gold-bearing, sheeted vein system extending at least 4,000 feet in an east–west direction and from 1,000 to 2,000 feet wide at the southern margin of a zoned pluton. Visible sulfides associated with gold–quartz mineralization consist of pyrite, chalcopyrite, molybdenite, and bismuthinite. International Bravo identified numerous subparallel gold-bearing sheeted quartz vein systems, three of which yielded impressive gold results. The overall system of sheeted quartz veins, measuring approximately 820 feet wide by 1,640 feet long and remaining

Figure 7. *Core drilling on Kinross–Teryl Gil claims. Drilling by Boart Longyear Co. Photo provided by R.C. Swainbank.*

open along strike, contains east–west-trending, steeply dipping vein zones varying from five feet to more than 100 feet thick within intrusive rocks. One sheeted quartz vein system assayed 0.31 ounces per ton gold over 32.8 feet, with a weighted average of 0.165 ounces per ton gold over a 65.6-foot zone. Gold mineralization is associated with anomalous silver, copper, and bismuth values. Drilling of two 330-foot diamond drill holes at East Divide intersected porphyry-hosted veinlets and fractures carrying quartz and sulfide mineralization. Mineralized quartz veins, as observed in surface exposures, were not intersected in drilling. Anomalous gold values reach 0.029 ounces per ton over 3- to 6-foot intervals.

International Bravo also completed prospecting and sampling on the West Pogo and Central properties. The West Pogo claims are immediately adjacent to the western end of the principal Teck–Sumitomo Pogo property, approximately 2 miles west of the Pogo deposit. West Pogo covers an elongated, northwest-trending, zoned pluton that has intruded metamorphic rocks. Exploration by Bravo in 2000 included detailed mapping and sampling. The Central property is 6 miles southeast of the Pogo property. Exploration by Bravo included prospecting and reconnaissance soil and rock sampling. Results were disappointing and Bravo relinquished its option on the West Pogo and Central properties.

Western Keltic Mines Inc. and Rimfire Minerals Corp. conducted exploration at their Goodpaster Gold Project, located east of the Pogo property. The exploration program included diamond drilling, soil sampling, and ground-based magnetometer and very-low-frequency (VLF) surveys funded through a financing and option agreement with Barrick Gold Corp. The exploration program focused within the Boundary and Southeast Surf areas where soil sampling in 1999 outlined broad gold and pathfinder element anomalies, and rock samples returned gold values grading up to 0.75 ounces per ton. A total of 770 samples consisting of 60 rock and 710 soil samples were collected at the Boundary and Southeast Surf prospects during 2000. Geophysics (15 miles of ground magnetic and 8.7 miles of VLF–EM surveys) points to a relatively strong magnetic high centered over a coincident gold–arsenic–bismuth soil anomaly extending at least 3,000 feet by 1,000 feet at the Boundary prospect. Data including 250 soil samples, 10.5 miles of ground magnetic survey and 6.2 miles of VLF–EM survey collected on the Southeast Surf anomaly define a gold–arsenic–bismuth anomaly over an area of 4,200 feet by 3,300 feet. Most of the gold anomaly lies within or straddles a porphyritic intrusion. The geophysical surveys confirm that the Spur Zone of the Southeast Surf anomaly is centered on a significant magnetic low.

Western Keltic and Rimfire completed a four-hole, 2,714-foot core drill program on the Boundary prospect. One hole did not intercept any significant mineralization. Visible gold was observed in the remaining three holes. Selected highlights include BND00–04, which intersected 1.6 feet grading 0.71 ounces per ton gold in quartz veinlets and BND00–01, which intersected 8 feet assaying 0.07 ounces per ton gold. Drilling revealed three styles of gold mineralization and showed that the extensive area of quartz-stockwork gold mineralization is more widespread than indicated by surface sampling. The highest gold values are hosted in 1- to 5-centimeter-wide quartz–pyrite–pyrrhotite veinlets that locally contain visible gold intergrown with bismuthinite. Broader zones of elevated gold values are found in quartz–sericite-altered or sheared gneiss locally cut by hairline quartz–pyrite–calcite stringers. Less commonly, quartz–pyrite–bismuthinite/arsenopyrite/gold veinlets occur in pegmatitic marginal phases of granitic dikes.

Hyder Gold Inc., in partnership with Rimfire Minerals Corp., completed a five-hole, 900-foot diamond-drilling program on the Eagle property, 19 miles southwest of Teck–Sumitomo's 5.6-million-ounce Pogo gold deposit. The core drill program tested portions of a 2-mile by 1-mile gold soil geochemical anomaly. The most significant hole, EA00–03, was drilled 260 feet east of a soil sample that returned 0.009 ounces per ton gold along with anomalous arsenic, bismuth, and tungsten. A 61.5-foot section in the mid part of the hole averaged 0.013 ounces per ton gold, including three samples containing greater than 0.029 ounces per ton gold. Elevated gold results are present from the first sample to the last sample of this 172-foot hole. Hole EA00–03 encountered weakly porphyritic granite that was consistently cut by quartz, quartz–calcite and, less commonly, quartz–pyrite–arsenopyrite veinlets. The other four holes, the nearest of which is 2,100 feet west of EA00–03, did not contain comparable gold results. Hyder Gold returned the Ogo, Fire, Bou, and Top claims to Rimfire at the end of the season.

Copper Ridge Explorations Inc. continued exploration on the Ogopogo project. A total of 1,227 soil samples were collected on a grid basis, ranging from 200- to 400-foot-square spacing; 27 rock samples were also collected. The most promising results are from the West Grid area. The highest value is 125 parts per billion gold with coincident anomalous arsenic and antimony.

NovaGold Resources Inc. continued to evaluate data from the Caribou project near the Salcha River. NovaGold is currently looking for a joint venture partner to fund further exploration on this property.

Barrick Gold Corp. signed a deal with the Alaska Mental Health Trust Land Office to explore Mental Health Trust lands in the upper Salcha River basin. Barrick also staked claims adjacent to these Mental Health Trust lands and named the combined area the Radio property.

Sumitomo Metal Mining America Inc. continued exploration of the Stone Boy property, completing 13,000

feet of core drilling during 2000 at Black Mountain.

Achieva Development Corp. collected 24 samples from properties in the Ladue River area. No anomalous geochemical results were received. The company expects to conduct further exploration on the property in 2001. Achieva also staked the Mac and Dall claims in the Tanana uplands and prospecting sites in the Shaw Creek area of the Big Delta Quadrangle.

AngloGold USA conducted exploration programs on properties optioned from Canada Fluorspar Inc. (formerly Blue Desert Mining Inc.). AngloGold can earn a 60 percent interest in the Gobi, Mojave, and Sahara properties near Teck's Pogo property. These early-stage properties are considered prospective for intrusion-associated gold mineralization. Bedrock trenching of an area with anomalous gold-in-soil samples confirmed lode gold mineralization on the Gobi property.

In July, Abacus Minerals Corp. signed a letter of intent with Engineer Mining Corp. for an option to earn 51 percent interest in the ER property near Pogo. A total of 33 stream-sediment, 14 soil, and 19 rock samples were collected on the property. A quartz vein rock sample from talus assayed 0.044 ounces per ton gold.

Fairfields Minerals conducted a soil geochemical program on the Shawnee property in the Goodpaster mining district. A gold anomaly was discovered during the work. Fairfields dropped the nearby Rock Creek property.

El Niño Ventures Inc. entered into a lease/purchase option agreement with Anglo Alaska Gold Corp. to acquire the Sassy gold property just north of Teck–Sumitomo's Pogo property. No work was announced during 2000.

Williams Creek Exploration conducted a geochemical soil survey on claims in the Goodpaster area. No anomalies were detected and no further work is planned.

Grayd Resource Corp. acquired all of North Pacific Mining Corp.'s right, title, and interest in royalties on the Delta claims. Grayd now controls most of the Delta mineral belt near Tok, Alaska, with claims over approximately 38 square miles. An inferred resource of 19.1 million tons averaging 0.6 percent copper, 2 percent lead, 4.7 percent zinc, 2.13 ounces per ton silver, and 0.055 ounces per ton gold within eight deposits has already been delineated on the Delta claims. Many of the deposits are still open, and there are a number of untested and partially tested targets that require further exploration.

Exploration work on Grayd's White Gold property in the Delta mineral belt yielded promising results. Highest values from a soil-sampling program contain 0.187 ounces per ton gold. Results from a recent trenching program following the soil anomalies include 0.025 ounces per ton gold over 32 feet true width and another interval averaging 3.37 ounces per ton gold over 3.2 feet at the Low showing. Gold mineralization is hosted in graphitic schist with arsenopyrite and stibnite mineralization. A trench at the Goldberg area exposed silicified schist with sporadic amounts of arsenopyrite that yielded 56 feet averaging 0.28 ounces per ton gold, with most samples exceeding 0.029 ounces per ton gold and one sample assaying 3.37 ounces per ton gold. A grab sample of schist with quartz veins from the Goldberg Saddle area assayed 0.67 ounces per ton gold. Hand trenching at the Shalosky showing exposed quartz–sericite-altered rock that averaged 0.114 ounces per ton gold over 54 feet, with strike extents of the zone covered in overburden. Hand trenching at the newly discovered Kokanee Hill showing encountered 0.152 ounces per ton gold in 32 feet of mineralized and altered rock. A soil grid was completed over the Kokanee Hill area and most of the 54 soil samples contained gold values greater than 0.003 ounces per ton. Inmet Mining Corp. also conducted exploration, including drilling, within the Delta mineral belt, at the AR property (fig. 8).

Teck signed a joint venture deal with Kennecott Exploration on the Napoleon property in the Fortymile mining district. Teck's exploration program included soil sampling and geophysics in an attempt to further define gold mineralization discovered by Kennecott's 1999 mapping, sampling, and drilling program. Teck also continued a regional exploration program focused in the eastern interior region of Alaska.

Kennecott Exploration Co. conducted a major exploration program in the Uncle Sam area between the Richardson mining district and the Pogo property. Geologic mapping, geochemical sampling, and core drilling subprograms evaluated extensive claim holdings staked and acquired by Kennecott in 1999 (fig. 9). Great Ameri-

Figure 8. *Drilling on Inmet Mining Corp.'s AR property in the Delta mineral belt. Photo provided by R.C. Swainbank.*

can Minerals Exploration Inc. was also active in the Uncle Sam area.

Placer Dome Exploration Inc. continued a second year of exploration on Tri-Valley Corp.'s 36.5-square-mile Buck and Buckeye portions of Tri-Valley's 51-square-mile Richardson project in the Richardson mining district. Placer Dome's exploration program included several core holes. Tri-Valley continued exploration on the retained 14.5-square-mile portion of the claim block in conjunction with Moscow-based TsNIGRI. Tri-Valley identified two new gold-bearing zones and plans to have a reverse-circulation drilling program in 2001.

North Star Exploration Inc. and its subsidiary, Zeus Exploration Inc., were active across most of the eastern interior region. Much of this exploration was conducted on lands under option agreements with Doyon Ltd. Major projects were conducted near Northway and in the Tofty–Hot Springs placer district. North Star identified a potential mineralized area that measures about 1,200 feet by 4,000 feet immediately north of the Alaska Highway at Northway near the Alaska–Yukon border named the Road Metal prospect. The gold–polymetallic mineralized zone was first discovered in road cuts at Northway Junction along the Alaskan Highway. Mineralized rocks are exposed for a distance of over 1,600 feet and soil auger samples and ground magnetic surveys extended the target 2,000–5,000 feet to the northeast. At least some of the mineralization is hosted in en-echelon "greisen veins" of quartz–tourmaline–white mica–sulfides and associated massive tourmaline and gossans. Water wells tested in the area had high concentrations of arsenic and lead. North Star Exploration reported assay results from two of five drill holes testing a large soil and geophysical anomaly at the Road Metal prospect. Selected highlighted assays include 73.8 feet of 0.045 ounces per ton gold and 0.34 ounces per ton silver (RM-00-03); 15.7 feet of 0.030 ounces per ton gold and 48.49 ounces per ton silver (RM-00-04); 9.7 feet of 0.435 ounces per ton gold (RM-00-04) and 24.18 ounces per ton silver; and 2.8 feet of 1.382 ounces per ton gold and 82.8 ounces per ton silver (RM-00-04).

Figure 9. *Bruce Cox manhandles a soil auger at Kennecott's Uncle Sam property. Photo provided by Kennecott Exploration.*

The Tofty/Manley exploration program was designed to drill-test a northeast-trending aeromagnetic anomaly that parallels the Sullivan bench in the Tofty–Hot Springs placer district, which has accounted for more than 550,000 ounces of historic placer gold production. Earlier research conducted by the U.S. Bureau of Mines indicates that a niobium-bearing carbonatite dike occurs in the area of this aeromagnetic anomaly. North Star's 2000 exploration work included cutting nine trenches with abundant visible gold. An 8-hole program with a total of 2,723 feet of core drilling was completed and one hole may have cut 159 feet of magnetite-rich, possibly niobium-bearing carbonatite. Assay and probe results are in process, but preliminary assays indicate anomalous niobium and rare-earth concentrations associated with magnetite.

Two short holes totaling 631 feet were drilled at Elephant Mountain near Rampart by North Star to test possible northern extensions of intrusion-hosted gold–polymetallic mineralization. Arsenopyrite and silicified granite were present in both holes.

Platinum–Palladium Holdings Inc. began a grassroots program that focused on platinum-group elements (PGE). Platinum–Palladium concentrated on the Rampart–Livengood districts of interior Alaska as one of three areas across Alaska with high potential for economic PGE mineralization. Bulk stream-sediment sampling (for preparation of heavy mineral concentrates), pan concentrate sampling of streams, and geologic traverses were conducted as part of the 2000 reconnaissance field program. Favorable areas were defined with strongly

differentiated, layered gabbroic to ultramafic cumulate rocks, many with trace amounts of pyrrhotite and chalcopyrite. No analytical results have been announced.

Ventures Resource Corp. released drilling results from the Flanders drill target on the Seventymile property near Eagle. Ventures has an option agreement on the property with Doyon Limited. Six holes (FD00–1 to FD00–6) were drilled for a total of 3,429 feet. Select highlights include FD00–4 where 3.6 feet of 6.01 ounces per ton gold and FD00–5 where 1.1 feet of 0.48 ounces per ton gold were intersected. No significant results were reported in FD00–1 or FD00–2. Results from drill hole FD00–6 included 16 feet of 0.25 ounces per ton gold, including 3 feet of 0.64 ounces per ton and 2 feet of 0.96 ounces per ton gold. Holes 3, 4, and 6 contained more than one significant intersection, generally ranging from 1 to 4.3 feet grading 0.1 to 0.48 ounces per ton gold. Mineralization occurs as coarse-grained native gold in a series or swarm of gently north-dipping, quartz–carbonate veins hosted by Triassic metabasalt and greenstone. Ventures plans to drill 15,000 feet in 2001 at the Flanders property.

Ventures Resource Corp. announced the staking of gold targets in 13 claim blocks (30,000 acres) on public land adjacent to the company's 980,000-acre Veta property, optioned from Doyon Ltd., in the Fortymile mining district. The claim blocks are on clusters of gold anomalies in the eastern 15 miles of a zone 40 miles across and include the Taz Creek, Willow Creek, Fortyfive Pup, and Gold Creek areas. The gold targets are defined by strongly anomalous pan concentrate sample values from 100 to 10,000 parts per billion gold and stream silt–sand sample values from 30 to over 2,000 parts per billion gold.

Ventures Resource Corp also announced drill results from its 2000 exploration program at Lead Creek, on the Champion property optioned from Doyon Ltd. Results from four drill holes include a 31.5-foot section grading 23.3 ounces per ton silver, 6.4 percent lead and 0.5 percent zinc in hole LC–14. In drillhole LC–13, 590 feet to the northwest, a 6.3-foot oxidized and leached interval contained 5.6 ounces per ton silver. Mineralization is hosted in a silicified limestone breccia unit with local skarn development and mineralization is open in all directions. Ventures plans to drill 5,000 feet at Lead Creek during 2001.

Newmont Alaska Ltd. continued work in the Circle mining district on the Gold Dust property optioned from Great Quest Metals Ltd. Newmont drilled two diamond drill holes totaling 827 feet in 2000 to test a coincident gold–arsenic soil anomaly on Mastodon Dome in the northeastern corner of the property, but did not drill the previously identified Central Zone. Both holes intersected anomalous gold, with hole MAS-00-03 intersecting 45 feet of 0.012 ounces per ton gold at 40-foot depth and hole MAS-00-04 intersecting a 1.2-foot-wide quartz vein at 64-foot depth grading 1.55 ounces per ton gold. Newmont dropped its option on the property at the end of the field season. On-Line Exploration Services Inc. also conducted an exploration program in the Circle mining district on the IC property at the headwaters of Independence Creek.

Usibelli Coal Mine Inc. was the successful bidder for 12,400 acres of state coal leases known as the Jumbo Dome leases. The lease area is adjacent to the company's existing leases and acquisition of the leases is expected to expand the company's existing coal reserves. Coal in the Jumbo Dome area has low sulfur, low nitrogen, and high calcium contents, which are desirable environmental attributes.

A number of placer miners reported minor exploration expenditures from across the region. Placer mining has been especially hard hit by low gold prices and placer exploration is a very minor percentage of overall exploration expenditures.

SOUTHCENTRAL REGION

MAN Resources Inc. and Nevada Star Resource Corp. continued evaluation of an 80,000-acre property in the Alaska Range for platinum-group-element (PGE) potential. More than 1,700 surface samples were collected in 2000. Geologic mapping has outlined the Fish Lake ultramafic body, occurring over a 27-mile by 1.2-mile area, as the largest ultramafic intrusion in the Cordillera. Another ultramafic body, Tangle, was discovered to the south of the Fish Lake body. Overall, five mafic–ultramafic intrusions are present in the central Alaska Range and lithogeochemical studies suggest that the intrusions are comagmatic with the Nikolai flood basalts. A drilling program on selected targets is planned for 2001.

Shear Minerals Ltd., in partnership with Shulin Lake Mining Inc., conducted an extensive exploration program for diamond-bearing kimberlitic/lamproitic intrusions and base and precious-metal potential at the Shulin Lake property approximately 25 miles southwest of Talkeetna. Geologic units in the area are Tertiary sandstone, siltstone, and coalbeds overlain by thin, glacially derived gravel/till. APEX Geoscience Ltd. and On-Line Exploration Services Inc. conducted a prospecting, geologic mapping, and sampling program. Over 100 till, rock, stream-sediment, and heavy mineral pan concentrate samples were collected; gold occurred in both gravel and bedrock samples. Samples analyzed by Saskatchewan Research Council contain potential diamond indicator minerals including magnesium-rich olivine, pyrope garnet, chrome diopside, and chromite (possible picroilmenite). Diamond-inclusion chemistry on chromite grains suggests a 'mantle-derived' signature. The property contains a large 2–3-mile-diameter circular positive magnetic anomaly that is interpreted to be a high-level intrusion. Review of geophysical data, from a previous government survey and a more detailed

geophysical survey flown this summer, shows a number (in excess of 20) of high-frequency anomalies that may be shallowly emplaced kimberlite, lamproite, or other alkaline ultramafic intrusions. A large basement magnetic-high anomaly centered over the property is coincident with drainage patterns as well as possibly the localization of four smaller lakes. Several samples with anomalous diamond indicator minerals have been identified near several interesting high-frequency shallow magnetic targets. Shear Minerals plans to drill-test selected high-priority targets in early 2001.

International Freegold Mineral Development Inc. (Freegold) staked 5,600 acres and acquired an additional 36 square miles through an option agreement with Ahtna Minerals Inc. (of Ahtna Native Corp.) in the Tonsina area. Fieldwork focused on defining the extent of PGE mineralization. The best sample from the property assayed 0.62 ounces per ton combined platinum–palladium.

Latitude Minerals Corp. conducted a preliminary helicopter reconnaissance program on the Tonsina platinum–palladium property that trends easterly onto Freegold's optioned lands. Latitude was granted the right to acquire a 90 percent interest from WGM for 16 prospecting sites and 46 state claims totaling 4,400 acres within 9 miles of the Richardson Highway and about 50 miles northeast of Valdez. The property covers a large layered mafic–ultramafic complex, which has dunite at the base grading upward through pyroxenite, websterite, gabbro, and norite. Layered chromite bands occur throughout the layered dunite and pyroxenite series and some of these layers are enriched with respect to PGEs. Geological and geophysical evidence indicates that the total strike length of the complex is in excess of 10 miles. Preliminary surface samples from Dust Mountain contain assays up to 0.347 ounces per ton palladium and 0.260 ounces per ton platinum. Preliminary samples collected from Sheep Mountain contained up to 0.043 ounces per ton combined platinum–palladium.

SOUTHEASTERN REGION

Kennecott Minerals, the operator of the Greens Creek polymetallic mine, conducted exploration drilling on 7,500 acres of land at the northern end of Admiralty Island acquired in an agreement with the U.S government. Most of the drilling was performed at Cub Creek, Killer Creek, Lower Zinc Creek, and the northeastern tip of the island.

Santoy Resources Ltd. acquired the Salt Chuck property on Prince of Wales Island from Stealth Ventures Inc. and conducted a surface and underground sampling program for platinum-group and base metals (fig. 10). The Salt Chuck mafic–ultramafic complex forms an elongated, concentrically zoned, northwest-trending body approximately 4.4 miles long and 1 mile wide. All known mineralization occurs along contacts between plug-like bodies of pyroxenite intruding gabbro. Ninety-six samples were collected from the underground workings of the historic Salt Chuck Mine, with a sample width of 5 feet. Weighted average grade of all underground sampling in the 494 feet of workings on the 300 level was 0.53 percent copper, 0.059 ounces per ton palladium, and 0.019 ounces per ton gold. Palladium values are significant even in areas with extremely low copper values. According to new interpretations, no surface sampling or mapping has been conducted where the underground mineralization projects to the surface. A total of 686 soil samples were taken at a 164-foot spacing along grid lines spaced 328 feet apart in the North Pole Hill area. Geologic mapping and a ground magnetometer survey totaling 15 line miles were also undertaken in the same area. The north flank of North Pole Hill represents a 4,200-foot-long target in which extensive copper and palladium soil anomalies are underlain by favorable geology and coincident positive magnetic response. The eastern portion of this target is also underlain by a strong IP chargeability anomaly. One known prospect, Geoff Showing, occurs within the eastern North Pole Hill area and sample values of 1.1 percent copper and 0.006 ounces per ton palladium were reported. A grab sample from a small dump next to a previously unknown adit returned values of 2.67 percent copper, 0.018 ounces per ton palladium, 0.071 ounces per ton gold and 0.409 ounces per ton silver.

International Freegold Mineral Development Inc. (Freegold) worked on its 100-percent-owned Union Bay platinum-group-element (PGE) property in southeastern

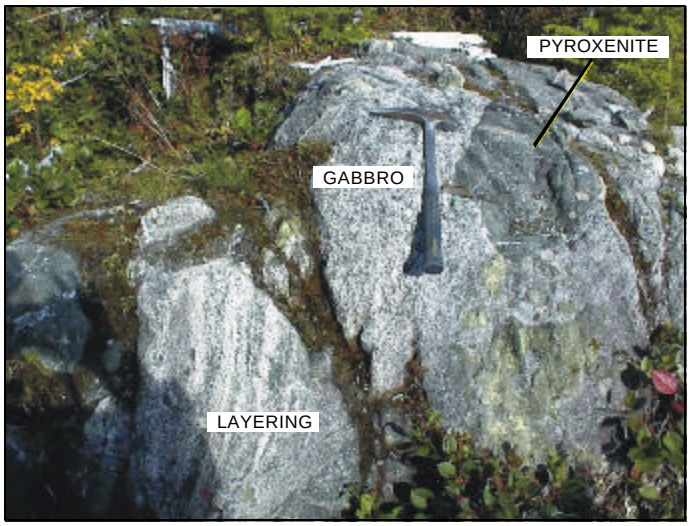


Figure 10. *Mixed zone at Santoy Resources Ltd.'s Salt Chuck property. Note the vertical layering within the gabbro and the dark pyroxenite inclusion on the right. Photo from Santoy Resources' website.*

Alaska during September and October. The Union Bay complex is one of several zoned Ural–Alaska type mafic–ultramafic complexes in southeastern Alaska and it ranges from a dunite core through wehrlite and magnetite-bearing olivine clinopyroxenite to hornblendite and gabbro on the margins. Previous work done on the property indicated the presence of anomalous chromite in dunite and the presence of up to 0.57 ounces per ton platinum and 0.143 ounces per ton gold in pan concentrates from streams draining the north side of the property. Broad-scale reconnaissance mapping and sampling identified three areas of the property where potential PGE-enriched mineralization was detected. Rock samples from these areas returned values ranging up to 0.54 ounces per ton platinum plus palladium from outcrops on the property. Three contiguous 5-foot chip samples returned 0.098, 0.176, and 0.505 ounces per ton combined platinum and palladium. Of the 212 rock samples collected during 2000, 38 returned assays greater than 100 parts per billion platinum and palladium and 17 of these samples returned platinum plus palladium values greater than 1,000 parts per billion. Twelve samples containing anomalous platinum plus palladium values were reanalyzed and contain anomalous chromium (up to 15,492 parts per million) and nickel (up to 675 parts per million), with variable but generally low copper (up to 52 parts per million) values and these samples also contain up to 233 parts per billion iridium, 700 parts per billion osmium and 170 parts per billion rhodium. Gold values were uniformly low (less than 30 parts per billion). Anomalous PGE mineralization is associated with magnetite and/or chromite-bearing pyroxenite and olivine pyroxenite units in at least three areas of the property. Following initial sample results, Freegold increased its holdings in the area to more than 2,500 acres.

Red Diamond Mining Co. examined the CJ property on Prince of Wales Island for sediment-hosted, structurally controlled gold vein system potential; the Mammoth property, about one mile northwest of Kennecott's Greens Creek Mine, for volcanogenic massive sulfide mineralization potential; and the Big Ledge property, on the western side of Chatham Strait approximately 20 miles southwest of the Greens Creek Mine, for mafic dike-hosted nickel–copper–PGE mineralization. Red Diamond has a 100 percent operating interest in all three properties. Recent sampling results from the Big Ledge property include nickel values exceeding 7 percent and copper values exceeding 4 percent, with elevated silver values and palladium values over 1 part per million. Continuous chip sampling across a 40-foot-thick mafic dike with stringers, clots, and disseminated pyrrhotite, pentlandite, chalcopyrite, and pyrite yielded a weighted average of 0.84 percent nickel and 0.91 percent copper.

DEVELOPMENT

After two slow years, development expenditures rebounded in 2000 to $141.71 million. This fourfold increase over the $33.8 million reported in 1999 reflects activity at the Red Dog Mine near Kotzebue, the Fort Knox Mine near Fairbanks, the Pogo property near Delta Junction, the port of Anchorage, and Greens Creek, Kensington, and A–J mines near Juneau.

Table 7 shows regional employment and development investment, and table 8 compares 2000 investment with that of the previous 18 years. Figure 11 shows the location of selected development projects. Note that some development employment and investment for Red Dog projects was in the southcentral area where the modules were built.

NORTHERN REGION

Cominco invested about $100 million in 2000 for the Mill Optimization Project (MOP) that included $44 million for a NANA Regional Corp./VECO Construction Inc. joint venture to construct two modules in Anchorage. The larger module, for concentrate flotation, weighed 3,000 tons, and the smaller powerhouse module weighed 1,000 tons. These were barged to the port near Kivalina, then transported 52 miles to the Red Dog mine by special Scheuerle module carriers contracted from the Prudhoe Bay oilfield. When complete, the MOP will increase mill throughput by about 8 percent. This follows completion of the Production Rate Increase (PRI) in 1998, which increased throughput about 30 percent, from about 2.53 million tons in 1996 to 3.3 million tons in 1999. Further details about the Red Dog Mine are available in the May 1998 issue of *Engineering & Mining Journal*.

Some permitting was reported for development of several gravel pits on the North Slope.

EASTERN INTERIOR REGION

Fairbanks Gold Mining Inc. (FGMI), a subsidiary of Kinross Gold Corp., continued optimization of the Fort Knox gold mine 25 miles northeast of Fairbanks. Development in the immediate vicinity of the mine included raising the tailing dam and in-pit drilling. Drilling, both reverse-circulation and core, continued at the Ryan Lode Mine near Ester, and at the True North Mine about 8 miles northwest of Fort Knox. FGMI is preparing to mine the True North deposit and truck about 10,000 tons per day of the 0.063-ounce-per-ton oxide ore to the existing mill to blend with about 30,000 tons of the 0.025-ounce-per-ton material from the existing pit.

Table 7. *Reported mineral development expenditures and employment in Alaska by commodity and region, 2000*

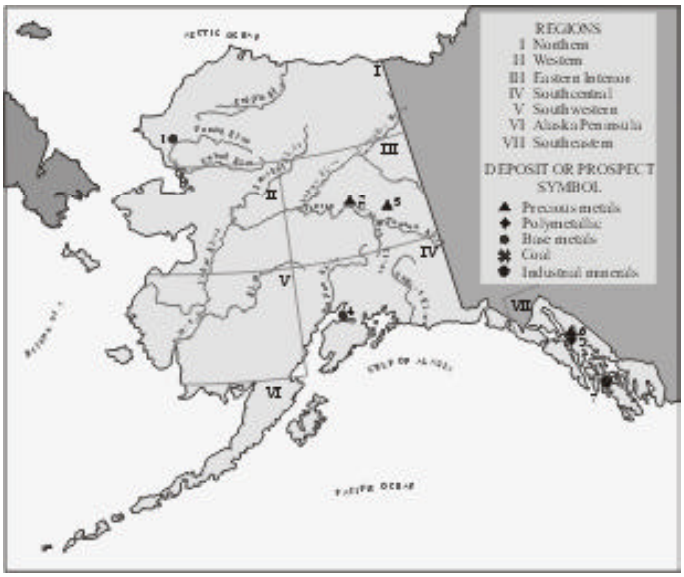
	Northern	Western	Eastern interior	South-central	South-eastern	Total
			Development expenditures			
Base metals	$54,000,000	$ - -	$ - -	$46,000,000	$ - -	**$100,000,000**
Polymetallic	- -	- -	- -	- -	16,400,000	**16,400,000**
Precious metals						
Placer	- -	100,000	262,000	37,000	- -	**399,000**
Lode	- -	- -	17,800,000	- -	6,500,000	**24,300,000**
Coal and peat	- -	- -	- -	- -	- -	- -
Industrial minerals	300,000	50,000	66,000	115,000	80,000	**611,000**
TOTAL	**$54,300,000**	**$150,000**	**$18,128,000**	**$46,152,000**	**$22,980,000**	**$141,710,000**
			Development employment			
Employment						
Workdays	57,200	1,560	12,480	3,380	14,040	**88,660**
Workyears[a]	224	6	48	13	54	**345**
Number of companies reporting[b]	4	2	7	5	5	**23**

- - No expenditures reported.
[a]Based on 260-day workyear.
[b]Some companies active in more than one area.
No development expenditures or employment reported for southwestern and Alaska Peninsula regions in 2000.

Table 8. *Reported mineral development expenditures in Alaska by commodity, 1982–2000*

	Base metals	Polymetallics	Precious metals	Industrial minerals	Coal and peat	Total
1982	$ 10,270,000	$ N/A	$ 19,320,000	$ 4,251,000	$ 7,750,000	**$ 41,591,000**
1983	19,500,000	N/A	7,112,500	1,000,000	250,000	**27,862,500**
1984	10,710,500	N/A	15,058,555	579,000	27,000,000	**53,348,055**
1985	13,000,000	N/A	16,890,755	1,830,000	2,400,000	**34,120,755**
1986	3,260,800	8,000,000	12,417,172	124,000	530,000	**24,331,972**
1987	38,080,000	48,000,000	13,640,848	188,000	342,000	**100,250,848**
1988	165,500,000	69,000,000	40,445,400	- -	- -	**274,945,400**
1989	118,200,000	411,000	6,465,350	7,000,000	2,196,000	**134,272,350**
1990	- -	4,101,000	7,136,500	30,000	3,079,000	**14,346,500**
1991	- -	8,000,000	14,994,350	262,000	2,318,000	**25,574,350**
1992	80,000	4,300,000	23,151,300	404,000	1,655,000	**29,590,300**
1993	- -	10,731,136	15,103,000	433,500	1,400,000	**27,667,636**
1994	10,000,000	5,000,000	27,392,850	5,000	2,545,000	**44,942,850**
1995	11,200,000	9,590,000	127,165,750	426,000	200,000	**148,581,750**
1996	60,000,000	60,100,000	273,042,000	495,000	400,000	**394,037,000**
1997	133,880,000	7,300,000	26,299,000	500,000	410,000	**168,389,000**
1998	28,000,000	5,600,000	15,602,000	5,355,000	850,000	**55,407,000**
1999	12,500,000	2,500,000	15,864,000	400,000	2,575,000	**33,839,000**
2000	100,000,000	16,400,000	24,699,000	611,000	- -	**141,710,000**
TOTAL	**$734,181,300**	**$259,033,136**	**$701,800,330**	**$23,893,500**	**$55,900,000**	**$1,774,808,266**

N/A = Figures not available prior to 1986.
- - Not reported.



I Northern Region
1. Red Dog Mine—Cominco Alaska Inc. (mill circuit/port storage)

II Western Region

III Eastern Interior Region
2. Fairbanks area
   a. Fort Knox Mine—Kinross Gold Corp. (drilling, tailing dam construction)
   b. Several open-pit and underground placer mines
   c. Ryan Lode Mine & True North Mine, Kinross Gold Corp.
3. Pogo Project—Teck Corp./Sumitomo Metals Mining America Inc. (incline and permitting)

IV Southcentral Region
4. Red Dog module construction—NANA Regional Corp./ VECO Construction Inc.

V Southwestern Region

VI Alaska Peninsula Region

VII Southeastern Region
5. Greens Creek Mine—Kennecott Mineral Co./Hecla Mining Co. (access drifting, underground drilling)
6. A-J Mine—Kvaerner Environmental (reclamation)
7. Kensington Mine—Coeur Alaska (optimization studies)

Figure 11. *Selected mineral development projects in Alaska, 2000.*

Public meetings and permitting for the True North Mine began in the early spring and continued through much of the year. The State of Alaska Department of Natural Resources issued a permit on December 20 authorizing construction to begin on January 20, 2001. The True North deposit is expected to provide 100 jobs with a $5.4 million payroll and have a $25 million positive annual economic impact to the Fairbanks North Star Borough.

Activity by Teck Corp. at the Teck–Sumitomo Pogo minesite northeast of Delta Junction included completion of the incline and drive into the Liese 1 Zone, uppermost of two stacked gold-bearing zones that are presently proposed for mining. Underground drilling provided better definition of the Liese 1 and 2 zones, and also explored the deeper L3 Zone. Teck also completed pilot-scale metallurgical testing on a 50-ton ore sample. Concurrent with physical development, Teck continued baseline environmental studies, public information meetings, and agency reviews required for permitting. A Draft Scoping Document for the Pogo Mine Project Environmental Impact Statement was submitted in August, and the permitting process is expected to continue through 2001. The U.S. Environmental Protection Agency is the lead permitting agency, in cooperation with the Alaska Department of Natural Resources. Teck is proposing an underground mine that would initially produce 2,500 tons per day and 375,000 ounces of gold annually, with a ramp-up to 3,500 tons per day yielding 500,000 ounces of gold annually. Construction would take two to three years after receiving permits, would require up to 500 workers, and would require a projected capital investment between $200 million and $300 million. The mine would have an estimated operational life of 12 years based on current reserves.

Several of the 68 placer mines in the region reported some development activity such as stripping overburden and road maintenance.

Usibelli Coal Mine Inc. continued planning to move its operations from the Poker Flats pit across Hoseanna Creek to the Two Bull Ridge area. The Two Bull Ridge area includes more than 2,500 acres of permitted land for mining that is expected to produce 2 million tons of coal per year over a 20-year mine life. The coal seams at Two Bull Ridge are relatively flat-lying and consist of the 2-foot-thick 3 Seam, the 38-foot-thick 4 Seam and the 21-foot-thick 6 Seam. The three coal seams have been identified by over 60,000 feet of drilling in over 300 holes to date. Usibelli is looking at reopening mining in the Rosalie Mine area near the townsite of Usibelli, with 6 million tons of coal reserves; the company was also involved in acquiring leases near Jumbo Dome for future operations.

SOUTHCENTRAL REGION

Two modules for the Red Dog Mine Mill Optimization Project were constructed at the Port of Anchorage in 2000 by the NANA/VECO joint venture; they were barged to the port at Kivalina in September. About 20 jobs were created by this $44 million project. Elsewhere in the region, minor development was reported at a few of the placer gold mines, and at some of the numerous gravel pits.

SOUTHEASTERN REGION

At Greens Creek Mine 20 miles west of Juneau, about 9,900 feet of development declines and inclines were created in 2000, and 82,300 feet of development drilling was completed. About $6 million was spent to upgrade metals recovery in the mill and to increase power generation to 5 megawatts; an additional $2.6 million was invested to improve the tailings storage facility.

At Coeur Alaska's Kensington gold mine about 50 miles north of Juneau, development activity consisted of investigation of alternative methods of tailings management, including on-land tailings disposal, and agency discussions related to those options.

Kvaerner Environmental completed the closeout of the historic Alaska–Juneau (A–J) Mine near downtown Juneau in July 2000, finalizing an effort that began in July 1997. The company was awarded the Governor's award for mine reclamation.

PRODUCTION

The total value of production from Alaska's mines and quarries in 2000 was $1,106.4 million, up 7 percent from the $1,032.9 million in 1999. Gold production from placer mines statewide dropped dramatically, and in the last quarter of the year production of zinc and lead from Red Dog Mine decreased as mill circuits were modified in the Mill Optimization Project. Although the Nixon Fork underground gold mine remained on care and maintenance status in 2000, by mid-year the Illinois Creek open-pit mine was in a "mining to reclaim" program. Production at Greens Creek Mine also continued to set records.

Table 9 shows the quantity and value of metals and materials produced from 1998 to 2000. Table 10 lists the miners and mines that had an Alaska Annual Placer Mining Application (APMA) for 2000, and which were reported by the U.S. Bureau of Land Management and the State Division of Mining, Land & Water to have had at least some production. Figures 12, 13, and 14, show the historic production of sand and gravel, gold, and coal. Selected production sites are shown in figure 15.

Table 9. *Estimated mineral production in Alaska, 1998–2000*[a]

	Quantity			Estimated values[b]		
Metals	**1998**	**1999**	**2000**	**1998**	**1999**	**2000**
Gold (ounces)	594,191	517,890	551,982[c]	$174,621,000	$144,262,000	$154,058,000
Silver (ounces)	14,856,000	16,467,000	18,226,615	82,154,000	85,628,000	90,404,000
Copper (tons)	1,900	2,100	1,400	2,850,000	2,982,000	2,296,000
Lead (tons)	102,887	125,208	123,224	49,386,000	57,596,000	51,754,000
Zinc (tons)	549,348	643,642	669,112	505,400,000	630,769,000	682,494,000
Subtotal				**$814,411,000**	**$921,237,000**	**$981,006,000**
Industrial minerals						
Jade and soapstone (tons)	2.0	2.0	2.0	$ 25,000	$ 25,000	$25,000
Sand and gravel (million tons)	12.40	10.6	10.6	57,280,000	52,418,000	49,855,000
Rock (million tons)	1.64	2.34	5.2	14,041,000	18,010,000	36,588,000
Subtotal				**$ 71,346,000**	**$ 70,453,000**	**$86,468,000**
Energy minerals						
Coal (tons)	1,339,000	1,560,000	1,473,000	$ 35,233,000	$ 41,048,000	$38,768,000
Peat (cubic yards)	38,000	38,000	35,600	190,000	165,000	178,000
Subtotal				**$ 35,423,000**	**$ 41,213,000**	$38,946,000
TOTAL				**$921,180,000**	**$1,032,903,000**	**$1,106,438,000**

[a]Production data from DGGS questionnaires, phone interviews with mine and quarry operators, Alaska Department of Transportation and Public Facilities, and federal land management agencies.
[b]Values for selected metal production based on average prices for each year; for 2000—gold ($279.10/ounce unless other value provided by operator); silver ($4.96/ounce); copper ($0.82/lb); zinc ($0.51/lb); lead ($0.21/lb). All other values provided by mine operators. Values rounded to nearest $1,000.
[c]Hardrock gold 505,668 ounces, placer 46,314 ounces.

Table 10. *Companies and individuals reported to be producing metal in Alaska, 2000*

Operator	Creek	District	Type[a]
	NORTHERN REGION		
Dykes, Bob	Nugget	Koyukuk	S/D Placer
Fleming, Mitchell	Myrtle	Koyukuk	O/P Placer
Green, Steve	Davis	Koyukuk	O/P Placer
Hall, John	Linda	Koyukuk	U/G Placer
Hamm, Ralph	Hammond River	Koyukuk	O/P Placer
Jiles, O. J.	Gold Bottom	Koyukuk	O/P Placer
Kotle Brothers	Clara	Koyukuk	S/D Placer
Lounsbury, Jim	Union Gulch	Koyukuk	O/P Placer
Nordeen, William	Emma	Koyukuk	U/G & S/D Placer
Olmstead, Jim	Gold	Koyukuk	O/P Placer
Paradise Mining	Birch	Koyukuk	O/P Placer
Philpott, Roy	Smith	Koyukuk	O/P Placer
Swan, James	Gold	Koyukuk	O/P Placer
Swenson, Lloyd	Slate	Koyukuk	O/P Placer
Tainter, Gary	Prospect	Koyukuk	O/P Placer
Tri-Con Mining	Nolan	Koyukuk	O/P and U/G Placer
Wicken, Jim	Gold	Koyukuk	O/P Placer
Cominco Alaska Inc.	Red Dog Mine	Noatak	HR O/P (zinc-lead-silver)
	WESTERN REGION		
Loyer, Victor	Candle	Fairhaven	O/P Placer
Tanner, Noel	Mud	Fairhaven	O/P Placer
Tanner, Noel	Candle	Fairhaven	O/P Placer
Taiga Mining	Bear	Hughes	O/P Placer
Rosander, Ron	Colorado	Innoko	O/P Placer
American Reclamation Group, LLC.	Illinois Creek Mine	Kaiyuh	HR O/P (gold-silver)
Benesch, George	Coffee	Kougarok	O/P Placer
Gumaer, Mark	Dick	Kougarok	O/P Placer
Lohman Mining	Coffee	Kougarok	O/P Placer
Mullikin, Donald	Noxapaga	Kougarok	O/P Placer
Pushcar, Jerry	Iron	Kougarok	O/P Placer
Redmond, Richard	Macklin	Kougarok	O/P Placer
Tweet, Bruce & Doug	Kougarok	Kougarok	O/P Placer
Magnuson, Manzie	Candle	McGrath	O/P Placer
Gibson, Wayne	Golden	Melotzitna	O/P Pacer
Anderson, Ralph	Rock	Nome	O/P Placer
Bartholomae, Bill	Goldrun	Nome	O/P Placer
Blake, Thomas	Iron	Nome	O/P Placer
Coggins, Graig	Norton Sound	Nome	S/D Placer
Groethe, Lenhart	Tripple	Nome	O/P Placer
Gustafson, Aaron	Norton Sound	Nome	S/D Placer
High Bench	Anvil	Nome	O/P Placer
Johnson, Al	Norton Sound	Nome	S/D Placer
K & S Leasing	Norton Sound	Nome	S/D Placer
Krutzsch, Betty	Specimen Gulch	Nome	O/P Placer
Lee, Robert	Norton Sound	Nome	S/D Placer
Massie, Perry	Cripple	Nome	O/P Placer
McCauley, Edward	Norton Sound	Nome	S/D Placer
McFarland, Frank	Norton Sound	Nome	S/D Placer
Mendenhall, Perry	Darling	Nome	S/D Placer
Olsen, Dave	Canyon	Nome	O/P Placer
Pettigrew, Bert	Anvil	Nome	O/P Placer

[a]O/P=Open-pit; HR=Hard-rock; U/G=Underground; S/D=Suction Dredge.

Operator	Creek	District	Type[a]
Pomrenke, Steve	Tripple	Nome	O/P Placer
Stamps, Thomas	Norton Sound	Nome	S/D Placer
Sykes, Frank	Norton Sound	Nome	S/D Placer
Turner, Martin	Norton Sound	Nome	S/D Placer
Wade, Mike	Norton Sound	Nome	S/D Placer
Walsh, Daniel	Gold Run	Nome	O/P Placer
Kralik, Janos	Gold Run	Port Clarence	O/P Placer
Stultz, Thomas	Gold Run	Port Clarence	O/P Placer
Tweet, Bruce & Doug	Windy	Port Clarence	O/P Placer
Clay, Barry	Swift	Ruby	O/P Placer
Tryck, Keith	Ophir	Ruby	O/P Placer
	Eastern Interior Region		
Decker, James	Sheep	Bonnifield	O/P Placer
Kiehl, Don	Gold King	Bonnifield	O/P Placer
Totat Mining	Totatlanika	Bonnifield	O/P Placer
Traxler, Gene	Totatlanika	Bonnifield	O/P Placer
Alaska Rose Garnet	Faith	Circle	O/P Placer
Catt, Bruce	Crooked	Circle	O/P Placer
Fulton, Gordon	Switch	Circle	O/P Placer
Glassburn, Don	Gold Dust	Circle	O/P Placer
Koppenberg, Sam	Faith	Circle	O/P Placer
Lapp, Ed & Sons	Ketchum	Circle	O/P Placer
Lines, Lester	North Fork Harrison	Circle	O/P Placer
Olsen, Steven	Eagle	Circle	O/P Placer
Smith, David Jr.	Switch/Deadwood	Circle	O/P Placer
Stone, James	Porcupine	Circle	O/P Placer
Willis Mine Service	Circle	Circle	O/P Placer
Wrede, Ronald	Switch	Circle	O/P Placer
Jensen, Dan	McCumber	Delta River	O/P Placer
Andresen, John	Dome	Fairbanks	O/P Placer
Bergman, Kevin	Ester	Fairbanks	O/P Placer
Cornelius, Fred	Fox	Fairbanks	O/P Placer
Fairbanks Gold Mining Inc.	Fort Knox Mine	Fairbanks	H/R O/P (gold)
Goodwin, Robert	Twin	Fairbanks	O/P Placer
Hassel, Jerry	Ready Bullion	Fairbanks	O/P Placer
Hopen, Alf	Cleary	Fairbanks	O/P Placer
Jobaric Enterprises	Wildcat	Fairbanks	O/P Placer
Knudsen, Richard	Specimen	Fairbanks	O/P Placer
Krzykoski, Ben	Big Eldorado	Fairbanks	O/P Placer
Largent, Walter	Ester	Fairbanks	O/P Placer
Las, Allen	No Grub	Fairbanks	O/P Placer
Loud, Dick	Chatanika	Fairbanks	O/P Placer
Miscovich, Andy	Wolf	Fairbanks	O/P Placer
Moore, Roger	Ready Bullion	Fairbanks	O/P Placer
Polar Mining	Fox Goldstream	Fairbanks	O/P Placer
Read, Donald	Treasure	Fairbanks	U/G Placer
Roberts, Mike	Dome/ Little Eldorado	Fairbanks	U/G Placer
Roman, Ron	Last Chance	Fairbanks	O/P Placer
Stein, Don	Dome	Fairbanks	O/P Placer
Thurman Oil & Mining	Smallwood/Fairbanks	Fairbanks	O/P Placer
Tweiten, Oscar	Chatham	Fairbanks	O/P Placer
45-Pup Mining	Fortymile	Fortymile	O/P Placer
Bickell, Harvey	Walker Fork	Fortymile	O/P Placer
Bras, Cy	Canyon	Fortymile	O/P Placer
Burns, John	Davis	Fortymile	O/P Placer

[a]O/P=Open-pit; HR=Hard-rock; U/G=Underground; S/D=Suction Dredge.

Operator	Creek	District	Type[a]
Carr, Brad	Chicken	Fortymile	O/P Placer
Edgerton, Judd	Napoleon	Fortymile	O/P Placer
GeoQuest	Chicken	Fortymile	O/P Placer
Gurule, Joe	Mosquito Fork	Fortymile	O/P Placer
Hayden, Forest	Kal	Fortymile	O/P Placer
Heflinger, Fred	Walker Fork	Fortymile	O/P Placer
Leach, James	Fortymile	Fortymile	O/P Placer
Likens, David	Fortymile	Fortymile	O/P Placer
Maxwell Mining	Kal / Squaw	Fortymile	O/P Placer
Mitchell, Howard	Mosquito Fork	Fortymile	O/P Placer
Mitchell, Joseph	Fortymile	Fortymile	O/P Placer
Mitchell, Paul	Eagle	Fortymile	O/P Placer
Olsen, Gordon	Jack Wade	Fortymile	O/P Placer
Olsen, Stephen	Liberty	Fortymile	O/P Placer
Reed, Scott	Fortymile	Fortymile	O/P Placer
Regner, Leo	Lilliwig	Fortymile	O/P Placer
Roberts, Robert	Chicken	Fortymile	O/P Placer
Schofield, Walter	Fortymile	Fortymile	O/P Placer
Seuffert, George Jr.	Chicken	Fortymile	O/P Placer
Treesh, James	Cherry/No Name	Fortymile	O/P Placer
Wolff, Flint	Walker Fork	Fortymile	O/P Placer
Cassiterite Placers	Tofty	Hot Springs	O/P Placer
De Lima Placers	American	Hot Springs	O/P Placer
Hodges, Jay	American	Hot Springs	O/P Placer
Ott, Richard	Omega	Hot Springs	O/P Placer
Wilder, Richard	Boulder	Hot Springs	O/P Placer
Wood, James	Little Boulder	Hot Springs	O/P Placer
AK Placer Dev.	Livengood	Tolovana	O/P Placer
Eaves, Samuel	Warwick Gulch	Tolovana	O/P Placer
	Southcentral Region		
Crow Creek Mining	Crow	Anchorage	O/P Placer
Girdwood Mining Co.	Crow	Anchorage	O/P Placer
Hoffman Mining	Chistochina	Chistochina	O/P Placer
Outsider Mining (John Trautner)	Canyon	Hope	O/P Placer
Willard, Gerald	Bear	Hope	O/P Placer
Miller, Jerry	Willow/Homestake	Willow Creek	O/P Placer
Mrak Placer Mine	Willow	Willow Creek	O/P Placer
Kragness, Sonny	Cache	Yentna	O/P Placer
LaCross, Jack	Willow	Yentna	O/P Placer
Lake Creek Placers	Lake	Yentna	O/P Placer
	Southwestern Region		
Chase Bros	Flat	Anvik	O/P Placer
Matter, Mark	Marvel	Aniak	O/P Placer
Nyac Placer	Bear	Aniak	O/P Placer
Wilmarth, Richard	Chicken	Iditarod	O/P Placer
Clarke-Wiltz	Podesie/Ganes	Innoko	O/P Placer
Little Creek	Little	Innoko	O/P Placer
Lyman Resources	Queen	Innoko	O/P Placer
Plano, Ed	Anvil	Innoko	O/P Placer
	Southeastern Region		
Big Nugget Mine	Porcupine	Juneau	O/P Placer
Kennecott/Hecla	Greens Creek Mine	Admiralty Island	U/G (zinc-lead-silver-gold)

[a]O/P=Open-pit; HR=Hard-rock; U/G=Underground; S/D=Suction Dredge.

Metals, with a value of $981 million, account for 88.7 percent of production, followed by industrial minerals (rock, sand, and gravel) with a value of $86.5 million (7.8 percent), and coal and peat at $38.95 million (3.5 percent).

Zinc continued to be the most valuable commodity produced in 2000 (669,112 short tons with a value of $682.5 million), followed by gold (551,982 ounces valued at $154 million), silver (18.2 million ounces worth $90.4 million), and then lead (123,224 tons worth $51.8 million). As a percentage of the total metal value, zinc was 69.6 percent, gold 15.7 percent, silver 9.2 percent, lead 5.3 percent, and other metals 0.2 percent.

Table 11 shows the average metal prices used in this report over the last 8 years. There was a slight increase in the price of zinc in 2000, but silver prices were down substantially from the previous year, impacting the profitability of the Greens Creek Mine. Gold continued to stagnate at prices essentially the same as in 1999.

These production estimates are from 157 questionnaires returned from miners, Native corporations, agencies, and municipalities, supplemented by about 100 phone surveys. Additional information was derived from Alaska Annual Placer Mining Applications (APMAs) submitted to the Division of Mining, Land & Water, but several placer miners could not be contacted, so the placer mine production is estimated to be conservative. There may also be some operations listed in table 10 that elected not to mine due to the low price of gold.

The authors also wish to thank the Alaska Railroad Corp., the Alaska Department of Natural Resources Division of Mining, Land & Water, the Department of Transportation & Public Facilities, the U.S. Bureau of Land Management and the U.S. Forest Service for providing information for this section of the report.

Some respondents reported costs and unit values, but in general metal values were computed from the weekly averages on the London Exchange, and do not take into account mining, shipping, smelting, or other costs incurred by the reporting company.

Tables 12 and 13 show the gold production by region of the state, and the percentage of placer production in small, medium, and large mines. Hardrock gold production increased from 447,662 ounces in 1999 to 505,668 ounces in 2000, while placer gold production declined from 70,228 ounces in 1999 to only 46,314 ounces in 2000.

Tables 14 and 15 show the value and regional importance of sand, gravel, and rock production. Production of sand and gravel, 10.6 million tons in 2000, was almost the same as in 1999, but rock production (5.2 million tons in 2000) was almost double the 2.3 million tons produced in 1999, due to increased roadwork in southcentral and southeastern Alaska.

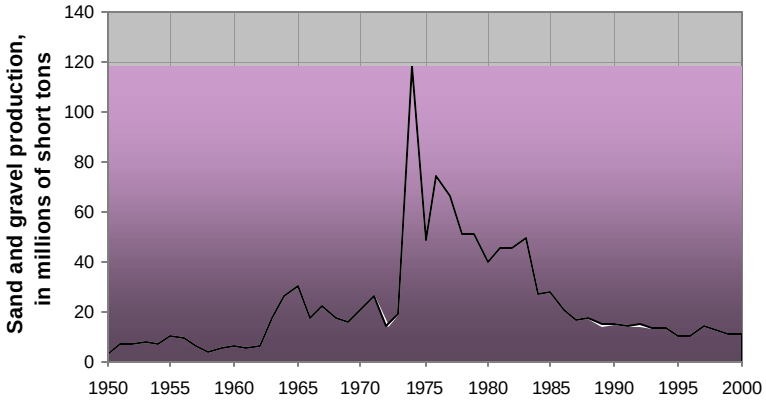


Figure 12. *Sand and gravel production in Alaska, 1950–2000.*

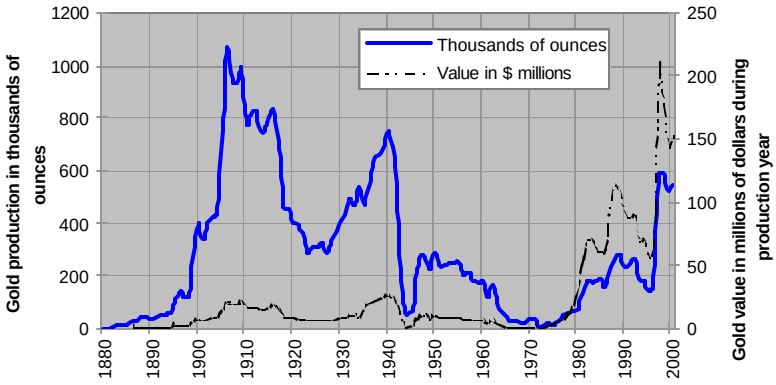


Figure 13. *Amount and value of gold production in Alaska, 1880–2000.*

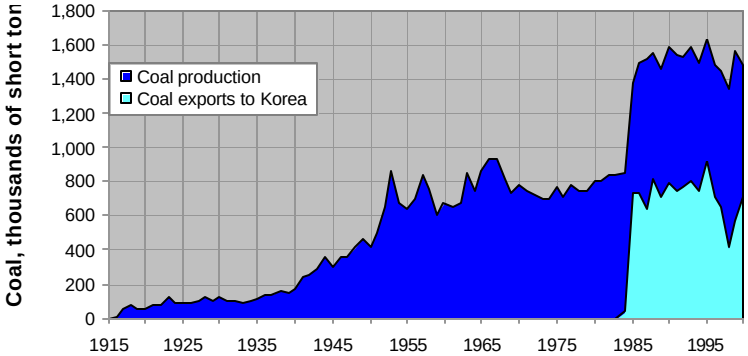


Figure 14. *Coal production in Alaska, 1915–2000, including exports to Korea.*

Coal production at Usibelli Coal Mine was 1,473,000 tons, slightly less than the 1,560,000 tons in 1999, but the 708,000 tons exported to Korea was up substantially from the 563,000 tons shipped in 1999.

NORTHERN REGION

METALS

Despite reduced production in the last quarter of the year during construction of mill modifications, Cominco's Red Dog Mine was able to increase production for 2000 to 585,030 dry short tons of contained zinc, 91,557 dry short tons of contained lead, and an estimated 5,843,000 ounces of contained silver. The average head grade of the record 3,365,508 short dry tons milled was 21.0 percent zinc, 4.7 percent lead, and 2.48 ounces silver per ton. Table 16 shows production for the last 12 years. The silver estimate is based on 70 percent recovery, as in 1997, the last year that silver recovery was reported. Zinc recovery was 55.3 percent and lead recovery was 59.6 percent.

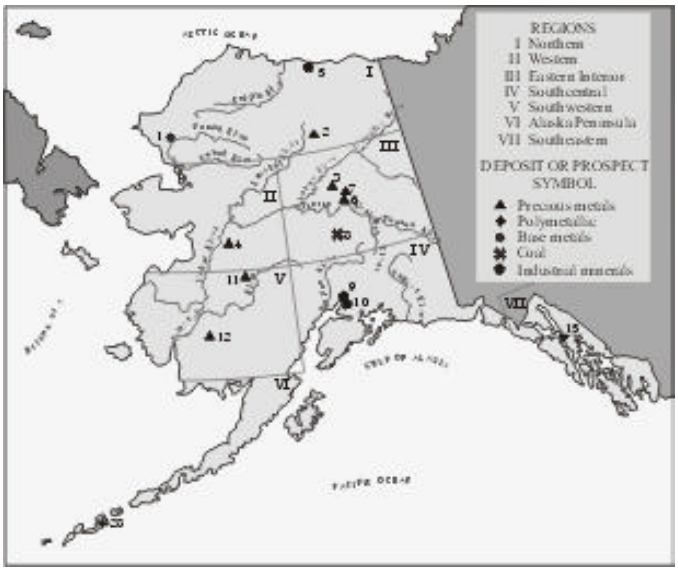
Proven ore reserves at Red Dog are 46.2 million tons of 19.2 percent zinc, 5.2 percent lead, and 2.92 ounces per ton of silver. Probable reserves are 61.8 million tons of 16.6 percent zinc, 4.1 percent lead, and 2.22 ounces per ton silver. Indicated resources are 14.3 million tons of 15.7 percent zinc, 5 percent lead, and 3.12 ounces per ton silver. Inferred resources are 40.8 million tons of 13.8 percent zinc, 4.3 percent lead, and 2.19 ounces per ton of silver.

The mine employs 422 mine-mill personnel, 104 support personnel, and an additional 60 temporary support personnel during the short shipping season. Most are housed at the mine, together with additional personnel involved in the Mill Optimization Project, and in ongoing exploration north of the mine.

Red Dog is a conventional open-pit operation, with a jaw crusher and gyratory crusher at the pit exit. These crushers feed the minus-6-inch coarse ore stockpile, which is then trucked to

Table 11. *Average metal prices, 1993–2000*

	Gold ($/oz)	Silver ($/oz)	Copper ($/lb)	Zinc ($/lb)	Lead ($/lb)
1993	359.00	4.30	0.87	0.44	0.18
1994	386.00	5.41	1.05	0.45	0.35
1995	395.00	5.43	1.33	0.48	0.34
1996	387.60	5.19	1.03	0.49	0.37
1997	330.76	4.91	1.03	0.59	0.28
1998	293.88	5.53	0.75	0.46	0.24
1999	278.70	5.20	0.71	0.49	0.23
2000	279.10	4.96	0.82	0.51	0.21



I Northern Region

1. Cominco Alaska Inc. Red Dog Mine, Noatak district—zinc–lead–silver (germanium)
2. Tri-Con Mining Alaska Inc. Swede Bench Nolan Creek placer property, Koyukuk–Nolan district—gold
3. Prudhoe Bay and Kuparuk pits (numerous)—sand and gravel

II Western Region

4. American Reclamation Group LLC. Illinois Creek Mine, Koyukuk–Hughes district—gold–silver

III Eastern Interior Region

5. Alaska Placer Development, Livengood–Tolovana district—gold–silver
6. Polar Mining Inc., Fairbanks district—gold–silver–screened aggregate
7. Kinross Gold Corp. Fort Knox Mine, Fairbanks district—gold–silver
8. Usibelli Coal Mine Inc., Bonnifield district—coal

IV Southcentral Region

9. Landscape Supply Corp., Hatcher Pass district—topsoil–peat
10. Palmer–Anchorage district—sand and gravel

V Southwestern Region

11. Clark–Wiltz Partnership, Innoko district—gold–silver
12. NYAC Mining Co., Nyac district—gold–silver

VI Alaska Peninsula Region

VII Southeastern Region

13. Kennecott Minerals Co./Hecla Mining Co., Greens Creek Mine, Juneau–Admiralty district—silver–zinc–gold–lead–copper

Figure 15. *Selected production projects, 2000.*

Table 12. *Reported refined gold production, number of operators, and industry employment in Alaska, 1998–2000*[a]

Region	Number of operators			Production in ounces of gold			Number of employees		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
Northern	4	5	17	731	1,262	1,434	9	8	11
Western	24	21	44	113,066	36,377	22,603	254	114	40
Eastern Interior	72	57	76	413,959	392,237	392,862	475	443	394
Southcentral	9	8	9	543	305	524	15	14	8
Southwestern	7	8	8	5,320	7,577	5,650	27	28	8
Southeastern	1	2	2	60,572	80,132	128,909	275	280	280
TOTAL	**117**	**101**	**156**	**594,191**	**517,890**	**551,982**	**1,055**	**887**	**741**

[a]2000 production includes 505,668 ounces gold from Illinois Creek, Fort Knox, and Greens Creek hardrock projects, and 46,314 ounces of placer gold.

Table 13. *Production for selected Alaska placer gold mines, 1994–2000*

Mine size	1994	1995	1996	1997	1998	1999	2000
				Number of mines			
Small[a]	24	11	9	25	45	38	60
Medium[b]	6	5	5	6	11	13	14
Large[c]	4	4	4	4	7	7	4
TOTAL	**34**	**20**	**18**	**35**	**63**	**58**	**78**
				Production in ounces			
Small[a]	2,789	1,459	1,433	5,077	10,159	4,710	8,981
Medium[b]	7,471	5,890	5,058	9,373	12,833	13,218	15,186
Large[c]	48,864	43,390	49,240	65,682	72,307	52,300	22,147
TOTAL	**59,124**	**50,739**	**55,731**	**80,132**	**95,299**	**70,228**	**46,314**

[a]<650 oz gold/yr.
[b]650-2,500 oz gold/yr.
[c]>2,500 oz gold/yr.
NOTE: Mine cost estimates are discontinued due to lack of information.

Table 14. *Reported sand and gravel production and industry employment in Alaska by region, 2000*

Region	Companies and agencies reporting[a]	Tons	Estimated unit value ($/ton)[b]	Total value	Estimated number of employees
Northern	4	3,700,000	4.29	$15,857,750	188
Western	6	652,000	3.69	2,404,000	44
Eastern Interior	6	1,061,000	4.51	4,782,500	106
Southcentral	8	3,946,000	4.82	19,032,000	163
Southwestern	3	535,000	8.00	4,284,000	49
Southeastern	3	738,000	4.74	3,495,000	53
TOTAL	**30**	**10,632,000**	**4.69**[c]	**$49,855,250**	**603**

[a]From 21 returned questionnaires and 15 phone canvass responses. Also data from the Alaska Railroad, Department of Transportation, Division of Mining, Land & Water Management, U.S. Forest Service, and U.S. Bureau of Land Management.
[b]Values are based on price and cost estimates from 17 producers.
[c]Weighted average unit value ($/ton) of sand and gravel production in Alaska.

the mill. Primary and secondary grinding with a semi-autogenous grinding (SAG) mill and ball mill convert the ore to 80 percent passing 65 microns to liberate the fine-grained ore. Tower mills are used in the regrind section of the mill circuit, which converts 80 percent of the zinc and lead concentrates to less than 22 and 19 microns, respectively.

The water for the flotation is treated to maximize efficiency, and naturally occurring carbon and sulfur are removed from the concentrate by a preflotation procedure. Both conventional and column cells are used for flotation, which occurs at an almost neutral pH. Most of the variables can be manipulated from a control panel using on-stream analysis for real-time assay information. Due to the extended winter, water is at a premium much of the year, and water in Red Dog Creek contains high levels of dissolved metals in its natural state, so it must be closely monitored to avoid environmental problems. The mine is a "zero-discharge" facility, and even runoff from the waste rock storage drains to the tailing pond for re-use.

Diesel generators presently provide power for the mine, but the federal Environmental Protection Agency is attempting to restrict the use of additional power units.

Table 15. *Reported rock production and industry employment in Alaska by region, 2000*[a]

Region	Companies and agencies reporting[b]	Tons	Estimated unit value ($/ton)[c]	Total value	Estimated number of employees
Northern	2	68,000	7.81	$ 531,000	6
Eastern Interior	2	71,000	9.41	668,000	10
Southcentral	4	2,471,000	5.20	12,849,000	63
Southwestern	3	366,000	15.00	5,490,000	16
Southeastern	3	2,206,000	7.73	17,050,000	55
TOTAL	**14**	**5,182,000**	**7.06**[d]	**$36,588,000**	**150**

[a]Includes shot rock, crushed stone, D-1, riprap, and modest quantities of ornamental stone.
[b]Derived from 8 questionnaires, 12 phone canvass responses. Also data from the Alaska Railroad, Department of Transportation, Division of Mining, Land & Water Management, U.S. Forest Service, and U.S. Bureau of Land Management.
[c]Unit value based on data supplied by 7 operations. Unit values for different stone products vary widely.
[d]Weighted average unit value ($/ton) of rock production in Alaska.
- - Not reported.

Table 16. *Red Dog Mine production statistics, 1989–2000*[a]

	Tons Milled	Ore Grade Zinc %	Lead %	Silver oz/ton	Total Tons Concentrate Produced[c]	Contained Tons Zinc	Contained Tons Lead	Million Ounces Silver[b]	Employees
1989	33,300	20.4	7.6	3.6	8,532	- -	- -	- -	228
1990	996,700	26.5	8.5	3.6	443,600	191,981	31,187	- -	350
1991	1,599,300	22.5	6.6	2.8	521,400	234,510	43,815	- -	331
1992	1,582,000	19.9	6.0	2.9	474,900	231,363	15,960	- -	349
1993	1,874,600	18.4	5.7	2.8	539,800	255,149	24,788	- -	376
1994	2,339,500	18.8	5.7	2.8	658,000	328,160	32,775	- -	391
1995	2,485,900	19.0	5.8	2.8	753,600	358,676	55,715	3.615	397
1996	2,312,600	18.7	5.0	2.8	765,300	357,680	65,886	4.304	417
1997	2,127,000	20.3	5.2	2.9	799,400	373,097	69,284	4.273	479
1998	2,752,587	21.4	5.2	2.7	1,015,773	490,461	80,193	5.202	466
1999	3,282,788	21.3	5.2	2.7	1,207,160	574,111	97,756	6.205	539
2000	3,365,508	21.0	4.7	2.5	1,211,539	585,030	91,557	5.843	536[d]

[a]Revised slightly from Bundtzen and others (1996) based on new company data.
- - = No data.
[b]Estimate based on grade and tonnage.
[c]Totals for years 1990 through 1995 include bulk concentrate.
[d]Includes 104 support personnel and 422 mine-mill personnel. Does not include temporary personnel.
SOURCE: Gary Coulter, Jim Kulas, and Garth Elsdon, Cominco Alaska Inc.

Cominco is investigating the use of shale-bed methane derived from the shale basins that contain the ore, and is also looking at the possibility of mine-mouth power from the high-rank or bituminous coals of the Deadfall Syncline coal deposit about 60 miles north of the mine. The Arctic Slope Regional Corp. owns some of the coal and has been exploring the export potential of Western Arctic coal for several years, but the lack of any port facility has been a severe constraint. Access to the loading facility at the Red Dog port could be the key to unlock the potential of the Western Arctic coal.

During the short summer shipping season up to 100 additional employees are located at the port to assist with the offloading of supplies and to load concentrate into 35,000- to 88,000-ton ships. At present two Foss maritime barges with on-deck Caterpillar 988 loaders are attended by three tugs to lighter the concentrates from the dock, where the water depth is only about 20 feet, to the ships. The Alaska Industrial Development and Export Authority (AIDEA) is taking the lead in studying the possibility of extending the loading conveyor, or dredging a channel to the dock.

About 19 placer gold mines were reported to have at least some production in the northern region in 2000, but only 1,434 ounces were recovered.

Industrial Minerals

Most of the 68,000 tons of rock used in the northern region in 2000 was at and around the Red Dog Mine. Although the amount of rock was similar to the amount used in the previous year, the use of sand and gravel, 3.7 million tons in 2000, almost doubled because of activity in the oilfields around Prudhoe Bay.

WESTERN REGION

Metals

Mining resumed at the Illinois Creek hardrock open-pit gold–silver mine in July, when American Reclamation Group LLC began a program of "mining to reclaim" under an agreement with the State of Alaska. Production in 2000 was from 357,000 tons of ore placed on the leach pad; 600,000 tons of waste was utilized as backfill in the Central Pit. Reclamation of the camp area was initiated, and several tons of excess chemicals were removed from the mine site.

About 43 placer gold operations were thought to be active in the western region in 2000, most of them on the Seward Peninsula, and many of them small suction-dredge operations off the Nome beaches. A total of 8,603 ounces were reportedly recovered.

Industrial Minerals

No rock production was reported in the western region in 2000, and production of sand and gravel was for local construction and upgrades in the vicinity of Nome. NovaGold Resources Inc. is investigating the possibility of shipping fill material from the abundant gold dredge tailings to the Puget Sound and San Francisco Bay areas.

EASTERN INTERIOR REGION

Metals

Fort Knox Mine, about 25 miles northeast of Fairbanks, was the largest operating gold mine in the state, mining 35.6 million tons, and milling 15 million tons to produce 362,959 ounces of gold. The gold is hosted in veins within a 93-million-year-old multi-phase granitic intrusion. Proven and probable reserves at the end of 2000 were 138.4 million tons containing 3.686 million ounces of gold. Measured and indicated resources were 34.45 million tons containing 963,000 ounces. Past production is shown in table 17.

Fairbanks Gold Mining Inc., the operator of Fort Knox for Kinross Gold Corp., plans to supplement ore from the existing open pit with ore from True North Mine about 8 miles northwest of the pit, blending about 10,000 tons per day of 0.067-ounce-per-ton True North ore with about 30,000 tons per day of the 0.027-ounce-per-ton Fort Knox material. When fully implemented, annual gold production will increase to about 450,000 ounces per year. Ore may also be shipped to the mill from the Gil property about 8 miles to the northeast.

The eastern interior area includes the Hot Springs, Tolovana, Circle, Fairbanks, Fortymile, Delta River, and Bonnifield mining districts, where about 76 placer operations were active, and produced a minimum of 29,903 ounces of gold (fig. 16).

Coal and Peat

Usibelli Coal Mine at Healy produced 1,473,355 tons of coal, of which 708,000 tons were exported to Korea on the Alaska Railroad through the port of Seward.

Several small pits in the Fairbanks area produced peat for local soil additive and horticultural use.

Industrial Materials

Most of the 71,000 tons of rock and 1.06 million tons of sand and gravel produced in the eastern interior was from several pits in the Fairbanks area, and east of Delta Junction. Almost all was used for roadwork in those areas.

Table 17. *Fort Knox Gold Mine production statistics, 1996-2000*

	Tons Mined	Tons Milled	Ounces Produced	Employment
1996	16,684,000	769,700	16,085	243
1997	32,380,000	12,163,151	366,223	249
1998	33,294,000	13,741,610	365,320	245
1999	30,350,000	13,819,010	351,120	253
2000	35,600,000	15,000,000	362,929	253

SOUTHCENTRAL REGION

METALS

About 524 ounces of gold were reportedly produced from nine small placer mines in the southcentral region in 2000.

COAL AND PEAT

Four pits in the Palmer–Anchorage area produced peat for local landscaping and horticultural use.

INDUSTRIAL MINERALS

Three major gravel pits in the Palmer area ship gravel to the Anchorage bowl on the Alaska Railroad, and five other pits in the Wasilla to Kenai area helped to produce the 3.9 million tons used in construction in the region. Major roadwork in the southcentral region was between mileposts 97 and 100 on the Glenn Highway, on Coho Loop Road, and Talkeetna Spur Road, and between mileposts 8 and 18 and the Bertha Creek/Ingram Creek sections of the Seward Highway. About 2 million tons of rock was excavated on the Seward Highway project.

SOUTHWESTERN ALASKA

METALS

About 5,650 ounces of placer gold were produced in 2000 from eight placer mines in the region.

INDUSTRIAL MINERALS

Calista Corp. provided about 340,000 tons of the approximately 535,000 tons of sand and gravel that was used for construction in the southwestern region.

SOUTHEASTERN REGION

METALS

The Kennecott Minerals Co. (70.3 percent)/Hecla Mining Co. (29.7 percent) Greens Creek Mine milled a record 619,438 tons of ore to produce concentrates containing 84,082 tons of zinc, 31,677 tons of lead, 12,424,093 ounces of silver and 128,709 ounces of gold. Past production is documented in table 18. Production from the two small gold placer mines in the region was minimal.

INDUSTRIAL MINERALS

Most of the 2.2 million tons of rock and 738,000 tons of sand and gravel used in the southeastern region in 2000 was for work on the Haines Highway and various U.S. Forest Service roads, though some was used for construction at Hyder, Stikine, Gustavus, and the Petersburg airport.

Approximately 50,000 tons of high-brightness calcium carbonate was stockpiled for test shipments at SeaCal's Calder Island limestone/marble operation on the northwest end of Prince of Wales Island.

Figure 16. *Forest Hayden's wash/sluice plant on Squaw Gulch in the Fortymile mining district. Photo provided by M.B. Werdon.*

Table 18. *Greens Creek Mine production statistics, 1989–2000*

	Tons Milled	Tons Concentrate	Contained Tons Zinc	Contained Tons Lead	Contained Ounces Silver	Contained Ounces Gold	Contained Tons Copper	Employees
1989	264,600	- -	18,007	9,585	5,166,591	23,530	- -	235
1990	382,574	- -	37,000	16,728	7,636,501	38,103	- -	265
1991	380,000	- -	41,850	16,900	7,600,000	37,000	- -	238
1992	365,000	113,827	40,500	16,500	7,100,000	32,400	- -	217
1993[a]	77,780	- -	9,500	3,515	1,721,878	7,350	- -	217
1994	- -	- -	- -	- -	- -	- -	- -	- -
1995	- -	- -	- -	- -	- -	- -	- -	- -
1996[a]	135,000	43,000	9,100	4,200	2,476,000	7,480	193	265
1997	493,000	- -	46,000	19,000	9,700,000	56,000	1,300	275
1998	540,000	- -	58,900	22,700	9,500,000	60,572	1,300	275
1999	578,358	- -	68,527	25,503	10,261,835	80,060	1,400	275
2000	619,438	- -	84,082	31,677	12,424,093	128,709	1,400	275

[a]Part-year production.
- - Not reported.

DRILLING

Table 19 is a listing of companies with significant drill programs in 2000. Tables 20 and 21 summarize the drilling activity in the state during 2000 by region and type of drilling. Core-drilling footage totaled 418,630 feet and reverse-circulation drilling footage totaled 143,118 feet. These values compare to 1999 values of 369,863 feet of core drilling and 78,934 feet of reverse-circulation drilling. Total footage drilled in 2000 was 23 percent greater than total footage drilled in 1999, even though exploration expenditures dropped sharply between 1999 and 2000. The Eastern Interior region had 42 percent of the total core drilling and 90 percent of the reverse-circulation drilling in Alaska during 2000.

Table 19. *Companies reporting significant drilling programs in Alaska, 2000*

Consolidated Aston Resources Ltd.	Inmet Mining Corp.	Placer Dome Exploration Inc.
Cominco Alaska Inc.	Kennecott Exploration Co.	Sumitomo Metal Mining America Inc.
Hecla Mining Co.	Kennecott Greens Creek Mining Co.	Teck Corp.
Hyder Gold Inc.	Kinross Gold Corp.	Usibelli Coal Mine Inc.
International Bravo Resource Corp.	Newmont Alaska Ltd.	Ventures Resource Alaska Corp.
International Freegold Mineral Development Inc.	North Star Exploration Inc.	Western Keltic Mines Inc./Rimfire Minerals Corp.
	NovaGold Resources Inc.	

Table 20. *Drilling footage reported in Alaska, 1982–2000*

Year	Placer Exploration	Placer Thawing	**TOTAL PLACER**	**TOTAL COAL**	**TOTAL HARDROCK**	Hardrock Core[a]	Hardrock Rotary[a]	**TOTAL FEET**
1982	30,000	94,000	**124,000**	**80,000**	**200,000**	- -	- -	**404,000**
1983	23,000	30,000	**53,000**	**12,000**	**180,500**	- -	- -	**245,500**
1984	31,000	98,000	**129,000**	**25,700**	**176,000**	- -	- -	**330,700**
1985	46,000	34,000	**80,000**	**8,700**	**131,700**	- -	- -	**220,400**
1986	32,400	227,000	**259,400**	**28,800**	**50,200**	- -	- -	**338,400**
1987	50,250	130,000	**180,250**	**19,900**	**115,100**	95,600	19,500	**315,250**
1988	152,000	300,000	**452,000**	**26,150**	**353,860**	223,630	130,230	**832,010**
1989	97,250	210,000	**307,250**	**38,670**	**332,230**	242,440	89,790	**678,150**
1990	78,930	105,000	**183,930**	**18,195**	**760,955**	648,600	112,355	**963,080**
1991	51,247	130,000	**181,247**	**16,894**	**316,655**	205,805	110,850	**514,796**
1992	6,740	65,000	**71,740**	**12,875**	**359,834**	211,812	148,022	**444,449**
1993	25,216	- -	**25,216**	- -	**252,315**	124,325	127,990	**277,531**
1994	21,000	- -	**21,000**	**8,168**	**438,710**	347,018	91,692	**467,878**
1995	27,570	- -	**27,570**	- -	**415,485**	363,690	51,795	**443,055**
1996	61,780	- -	**61,780**	**8,500**	**658,857**	524,330	134,527	**729,137**
1997	38,980	- -	**38,980**	**13,998**	**704,510**	523,676	180,834	**757,488**
1998	33,250	- -	**33,250**	**2,300**	**549,618**	505,408	45,670	**585,168**
1999	6,727	- -	**6,727**	- -	**448,797**	369,863[b]	78,934	**455,524**
2000	15,480[c]	- -	**15,480**	- -	**546,268**	418,630[d]	127,638	**561,748**

[a]Core and rotary drilling not differentiated prior to 1987.
[b]108,022 feet of core drilling was underground.
[c]Placer and sand & gravel exploration and development.
[d]112,400 feet of core drilling was underground.
- - = Not reported.
Note: Blasthole drilling not reported. Approximately 4,920,000 feet in 1999. Auger or rotary drilling footages for sand and gravel not included in totals.

Table 21. *Drilling footage by region in Alaska, 2000*

Type of drilling	Northern	Western	Eastern interior	South-central	South-western	South-eastern	TOTAL
Placer subtotal	- -	- -	15,480	- -	- -	- -	**15,480**
Coal subtotal	- -	- -	- -	- -	- -	- -	- -
Hardrock core	102,600	5,518	177,042	- -	4,594	128,876	418,630[a]
Hardrock rotary	- -	15,000	112,638	- -	- -	- -	127,638
Hardrock subtotal	**102,600**	**20,518**	**289,680**	- -	**4,594**	**128,876**	**546,268**
TOTAL (feet)	**102,600**	**20,518**	**305,160**	- -	**4,594**	**128,876**	**561,748**

- - = Not reported.
[a]112,400 feet of core drilling was underground.
Note: Blasthole drilling not reported.

GOVERNMENT ACTIONS

Significant changes were made to the statutes governing location and recording of state mining claims and prospecting sites in 2000, effective August 31. The allowable time between location in the field and recording at the Recorder's Office was reduced from 90 days to 45. Mining-claim law was expanded to include the option of filing a 160-acre claim. Rental costs for the larger claims are four times those for the standard 40-acre claim, but the costs of staking, recording, and management are reduced for the larger claim.

DNR has reduced the time required to get mining information into their Land Administration System (LAS) and on Status Plats. DNR is using a new application that helps automate the process of updating status plats. The most useful feature of this program is an interface to LAS that updates the activity codes for all actions on townships as they are completed. This new feature eliminates repetitive manual labor required to prepare status plat data. Status plats are now available on the Internet (www.dnr.state.ak.us/landrecords/). DNR also has a new system that simplifies the receipting process for paying annual rental on new mining claims. DNR created a subsystem in the Land Administration System that will use the index information loaded on the Recorder's Office System to automatically note new mining claims and input them into the DNR system, especially when the new claims paperwork uses aliquot part location descriptions.

DNR is the host agency for a website that provides an electronic pathway for the public to access a wide variety of information in the form of maps, images, and descriptions about Alaska geospatial data. The Alaska State Geospatial Data Clearinghouse (ASGDC) is a web site (http://www.asgdc.state.ak.us/) for state and local agencies to make all their GIS data readily available. Federal standards for documentation (metadata) are required. The new site emphasizes public access to maps, on-line mapping tools, and GIS (geographic information system) data.

Placer gold mining at the Yellow Eagle Mine appears to have caused domestic well water disruptions in the Ester area west of Fairbanks. DNR's Division of Mining, Land & Water determined that mining activities in the open pit tapped a near-surface aquifer in late 1999, causing well water problems and significant damage to the nearby George Parks Highway. Yellow Eagle Mining Inc. did not mine during 2000 due to lack of venture capital and continued low gold prices.

Table 22 lists revenues derived from the mining industry by the State of Alaska and by municipalities. Payments of taxes to municipalities increased 4.5 percent from $8.8 million in 1999 to $9.2 million in 2000.

The Alaska Geologic Materials Center (GMC), a facility operated by DGGS in cooperation with BLM, the USGS, the U.S. Minerals Management Service, and the Alaska Oil & Gas Conservation Commission, received 17 pallets of hard-rock mineral core from the U.S. Bureau of Land Management from two southeastern Alaska prospects: Bohemia Basin gabbroic nickel–copper prospect of Yakobi Island, and Mirror Harbor gabbroic nickel–copper prospect on the west coast of Chichagof Island. The GMC also received 30 pallets of hard-rock sulfide mineral core for four exploratory holes from the Whistle Pig prospect of the Groundhog basin near Wrangell, Alaska. Calista Corp. donated material from 27 exploratory holes at their Donlin Creek prospect in southwestern Alaska.

DGGS used federal funds available through the Minerals Data and Information Rescue program to convert

DGGS legacy publications to digital products. DGGS estimates that it has approximately 2,400 documents in hard copy, consisting of around 65,000 pages of text and just over 3,000 maps. These include publications in all of DGGS's document series and those of its predecessors (such as the Territorial Department of Mines). Some of the digital products are currently available on the DGGS website at http://wwwdggs.dnr.state.ak.us/.

Mineral resource databases are being built by many government agencies and some of these databases are already available to the general public. The U.S. Geological Survey's Alaska Resource Data File (ARDF) program now has over 11,000 mineral occurrences cited for over 81 1:250,000-scale quadrangles, while work on 32 other quadrangles is in progress (http://ardf.wr.usgs.gov/). The U.S. Geological Survey Rock Analysis Storage System (RASS) geochemical data is available for data produced by the USGS in Alaska, as part of the National Geochemical Database. The data represent analyses of stream-sediment, heavy mineral concentrate, soil, and organic material samples. The database contains over 126,000 records and is available online at http://geopubs.wr.usgs.gov/open-file/of99-433.

For the first time in eight years there was no mineral-related airborne geophysical survey by the Division of Geological & Geophysical Surveys (DGGS) in 2000, but crews were field checking and mapping portions of the 1998 Fortymile and 1999 Pogo area surveys (fig. 17; tables 23, 24). The Division of Mining, Land & Water continued its joint-venture work with the U.S. Geological Survey in the Pogo area. The U.S. Bureau of Land Management, assisted by DGGS, released the results of its April airborne

Table 22. *Revenues paid to the State of Alaska and municipalities by Alaska's mineral industry, 1995–2000*[a]

	1995	1996	1997	1998	1999	2000
State mineral rents and royalties						
State claim rentals[b]	$ 703,508	$ 917,970	$ 1,036,782	$ 1,170,812	$ 1,982,453	$ 1,975,376
Production royalties	13,661	20,002	8,930	9,489	14,214	6,175
Annual labor	32,195	55,195	80,795	118,020	90,720	79,907
Subtotal	**749,364**	**993,166**	**1,126,507**	**1,298,321**	**2,087,387**	**2,061,458**
State coal rents and royalties						
Rents	172,026	188,210	173,773	331,716	205,983	233,249
Royalties	1,866,954	996,408	1,342,077	1,937,899	2,615,858	1,482,803
Bonus	0	0	0	0	0	372,000
Offshore Prospecting Permits	4,182	0	0	0	0	0
Subtotal	**2,043,162**	**1,184,619**	**1,515,850**	**2,269,615**	**2,821,841**	**2,088,052**
State material sales						
Mental Health	10,108	63,324	57,620	40,269	32,407	33,928
Division of Land	351,094	699,845	278,913	1,043,602	586,550	449,343
SPCO	115,745	26,673	27,579	28,491	28,941	41,395
Subtotal	**476,947**	**789,842**	**364,112**	**1,112,362**	**647,898**	**524,666**
State mining miscellaneous fees						
Filing Fees	2,074	1,500	4,187	2,510	4,288	5,400
Penalty Fees	1,000	0	0	0	8,000	0
Explore incentive app filing fee	0	0	0	2,000	3,000	0
Bond pool payment	60,619	87,411	91,666	79,929	70,692	50,100
Surface coal mining app fee	7,530	36,728	16,100	6,890	2,500	1,830
APMA mining fees	19,950	21,950	22,454	18,975	19,288	18,550
Subtotal	**91,173**	**147,589**	**134,407**	**110,304**	**107,768**	**75,880**
Mining license[c]	484,035	481,000	941,735	1,797,292	1,296,663	2,712,541
State total	**3,844,681**	**3,596,216**	**4,082,611**	**6,587,894**	**6,961,557**	**7,462,597**
Payments to Municipalities	**N/A**	**N/A**	**8,386,000**	**7,934,000**	**8,818,819**	**9,196,500**
TOTAL	**$3,844,681**	**$3,596,216**	**$12,468,611**	**$14,521,894**	**$15,780,376**	**$16,659,097**

[a]Does not include state corporate income taxes, which were not released for this study.
[b]Includes upland lease and offshore lease rentals.
[c]Includes metals, coal, and material. New numbers 1997-2000 from Department of Revenue.
N/A = not available.
- - = not reported.
SOURCE: Municipalities, companies, and DNR Financial Services Section.

Figure 17. *Outcrop of Goodpaster Batholith with Air Logistics of Alaska Inc. helicopter in background. DGGS conducted reconnaissance sampling and mapping in the Salcha River/Pogo geophysical tract during 2000. Photo provided by M.B. Werdon.*

geophysical survey of the Aniak district, which includes the 11.5-million-ounce Donlin Creek gold prospect, in September.

In 1999 the Division of Geological & Geophysical Surveys (DGGS) contracted for an airborne geophysical survey of about 1,032 square miles northwest of the Pogo deposit. Results of the Salcha River–Pogo (SRP) geophysical survey were released in early 2000. DGGS geologists spent three weeks conducting geologic ground-truthing, including geologic mapping and geochemical sampling, in the SRP area.

A team of DGGS geologists continued geologic investigations in the Fortymile area within the area of a 1998 airborne geophysical survey. Geologic mapping was completed in the Eagle A-2 Quadrangle and geochemical results from the 2000 field season were released. A preliminary geologic map of a portion of the Fortymile mining district mapped by DGGS in 1999 was released in June 2000 and a new geologic map of the Eagle A-2 Quadrangle will be released by DGGS in June 2001.

During 2000 DGGS also released an interpretive bedrock-geologic map of the Petersville (Yentna) mining district and a preliminary geologic map of the Iron Creek area (Talkeetna Mountains B-5 Quadrangle). Geochemical results from rocks collected in the Iron Creek area were also released. DGGS produced a page-size geologic map of Alaska; the map is available for download at the following URL: http://wwwdggs.dnr.state.ak.us/akgeomap.html .

The Division of Mining, Land & Water, working with the U.S. Geological Survey, continued studies of the natural water quality in the Goodpaster River drainage.

The Department of Natural Resources presented reclamation awards in 2000 to Kvaerner Environmental, Fairbanks Gold Mining Inc., and the Alaska Department of Fish & Game's Northern Habitat Division for outstanding reclamation projects. Kvaerner fulfilled all abandonment responsibilities incurred by Echo Bay Alaska's lease of the Alaska–Juneau Gold Mine from 1985 to 1997. Kvaerner operated the closeout phase of the

Table 23. *Detailed federal airborne geophysical survey work as of December 2000*[a]

Wrangell/Stikine[b]	1,111 sq. miles	Airborne geophysical mapping
Koyukuk/Wiseman	533 sq. miles	Airborne geophysical mapping
Ketchikan[c]	605 sq. miles	Airborne geophysical mapping
Aniak	1,240 sq. miles	Airborne geophysical mapping
Total: 5 years $1.34 million	**3,489 sq. miles**	**0.5% of Alaska's total area**

[a]Projects funded mainly by U.S. Bureau of Land Management with contributions by DGGS, local and state governments, and private corporations. Projects concentrate mainly on federal land. Data are released through DGGS.
[b]Major funding came from BLM and the City of Wrangell.
[c]Major funding came from BLM and Ketchikan Gateway Borough. Sealaska Corp., Alaska State Mental Health Land Office, the City of Coffman Cove, and the City of Thorne Bay also contributed funds. Sealaska Corp. also contributed previously acquired geophysical data.

project from 1997 to 2000 and completed all legal and regulatory requirements along with various contractual obligations. Kvaerner obtained a U.S. Environmental Protection Agency (EPA) NPDES (National Pollutant Discharge Elimination System) permit to legally discharge over 180 million gallons of water, removed and remedied various historic oils and greases, completed a cement stabilization program of historic mine septic tank sludge, and prepared and executed a detailed mine closure plan. Kvaerner was able to bring a highly contentious and emotionally charged project to successful completion within a reasonable timeframe by using creative solutions and working with citizens of the City and Borough of Juneau.

As part of the reclamation plan for Fort Knox Mine, Fairbanks Gold Mine Inc. established a wetlands complex in the area of Fish Creek between the tailings dam and the freshwater reservoir. The wetlands construction goes significantly beyond legal requirements and exponentially increased the Arctic grayling and burbot population in the channel and pond complex. The Department of Fish & Game's Northern Habitat Division worked as a partner with Fairbanks Gold Mine Inc. and was recognized for the quality of their technical advice and the ability of the staff to transcend their role as a regulatory agency to become a partner in the construction of the wetlands complex.

The Alaska Department of Transportation & Public Facilities began a $2 million regional transportation study of northwestern Alaska that covers an area from St. Michaels, near the mouth of the Yukon River, to the North Slope. The study is an important step towards securing federal and state funds for public infrastructure in this area that includes mineral deposits on the Seward Peninsula, the western Arctic coalfield, the Noatak (Red Dog) mining district and the Ambler mineral belt. All options for transportation are being considered, including a freight railroad that could connect to interior Alaska or the western coast near the Red Dog port or on Norton Sound on the south side of the Seward Peninsula.

Table 24. *Detailed state airborne geophysical surveys and follow-up geologic ground-truthing as of December 2000*[a]

Nome District western core area	494 sq. miles	Airborne geophysical/ground-truth geological mapping
Nyac District core area	183 sq. miles	Airborne aeromagnetic mapping
Circle District core area	338 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Valdez Creek District	75 sq. miles	Airborne geophysical mapping
Fairbanks District	626 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Richardson District	137 sq. miles	Airborne geophysical mapping
Rampart/Manley-Tofty	1,026 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Upper Chulitna District	364 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Petersville-Collinsville District	415 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Iron Creek District	689 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Ruby District	591 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Fortymile District	1,036 sq. miles	Airborne geophysical mapping/ground-truth geologic map (ground-truth began FY00; 3-year project)
Livengood District	229 sq. miles	Airborne geophysical mapping
SalchaRiver/North Pogo	1,032 sq. miles	Airborne geophysical mapping (ground-truth began in FY01; 3-year project)
Total: 9 years $4.4 million	**7,235 sq. miles**	**1.2% of Alaska's total area**

[a]Projects funded by the Alaska State Legislature. Projects concentrate on state, Native, state-selected and Native-selected lands and are managed by DGGS.

Note: Surveys listed above are complete except where noted. Additional areas will be scheduled for surveying at later dates contingent on future funding.

APPENDIX A

New claims staked in Alaska 1996-2000

Quad no.	Quadrangle name	New federal mining claims					New state mining claims				
		1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
14	Sagavanirktok	0	0	0	0	0	1	0	0	0	0
17	Point Hope	0	0	0	0	0	43	0	0	0	0
18	De Long Mountains	0	0	0	0	0	0	0	0	4,685[a]	72
26	Noatak	0	0	0	0	0	633	96	0	1,411	216
27	Baird Mountains	0	1	0	0	0	1	0	0	64	1
28	Ambler River	0	0	0	0	0	0	1,437	6	0	95
29	Survey Pass	0	0	0	0	0	0	613	0	0	0
30	Wiseman	0	47	90	13	15	49	22	30	92	33
31	Chandalar	3	17	1	13	10	134	81	56	3	8
35	Kotzebue	0	0	0	0	0	0	28	0	0	0
36	Selawik	0	0	0	0	0	0	53	0	2	0
38	Hughes	0	0	0	0	0	0	73	1	1	0
39	Bettles	0	56	28	12	1	0	0	1	1	0
43	Teller	0	0	0	0	0	0	1	4	24	0
44	Bendeleben	0	0	0	0	0	48	124	43	56	64
45	Candle	0	0	0	0	0	32	75	8	0	26
47	Melozitna	0	0	0	0	0	4	0	0	0	1
48	Tanana	0	0	0	0	0	123	235	81	11	134
49	Livengood	0	1	0	0	0	1,744	250	28	38	186
50	Circle	0	0	0	0	0	273	719	664	391	551
52	Nome	0	0	0	0	0	165	102	16	1	9
53	Solomon	0	0	0	0	0	31	28	8	11	39
55	Nulato	0	0	0	0	0	0	0	56	80	28
56	Ruby	0	0	0	0	0	355	137	657	90	4
57	Kantishna River	0	1	0	0	0	0	0	0	8	0
58	Fairbanks	0	0	0	0	0	143	361	73	22	28
59	Big Delta	0	0	0	0	0	694	976	4,242	2,775[b]	1,547
60	Eagle	0	0	0	0	0	136	180	794	465	761
64	Ophir	0	0	0	0	0	60	24	46	59	12
65	Medfra	0	0	0	0	0	1	118	26	37	0
67	Healy	0	0	0	0	0	302	393	683	78	12
68	Mt. Hayes	124	772	2	0	8	968	950	803	488	517
69	Tanacross	0	0	0	0	0	282	112	933	313	140
73	Iditarod	70	0	0	0	0	486	195	94	0	0
74	McGrath	0	0	0	0	0	0	0	0	16	0
75	Talkeetna	0	0	0	0	0	174	126	102	83	123
76	Talkeetna Mountains	0	4	0	0	0	226	39	112	18	59
77	Gulkana	0	0	0	0	0	0	192	6	231	0
78	Nabesna	0	0	0	0	0	0	2	1	2	0
81	Russian Mission	0	0	0	0	0	0	0	0	0	4
82	Sleetmute	0	0	0	0	0	0	0	0	62	0
83	Lime Hills	0	0	0	0	0	2	242	27	12	0
84	Tyonek	0	0	0	0	0	0	10	23	86	3
85	Anchorage	0	0	0	0	0	52	99	84	107	43
86	Valdez	0	0	0	0	0	10	7	0	1	153
87	McCarthy	0	0	0	0	0	0	0	48	0	0
91	Bethel	0	0	0	0	0	0	91	0	0	0
92	Taylor Mountains	0	0	0	0	0	0	131	7	0	12
93	Lake Clark	0	0	0	0	0	400	0	0	0	0
95	Seward	0	108	44	24	24	31	13	12	29	13
96	Cordova	0	1	0	0	0	3	0	1	0	0
97	Bering Glacier	0	0	0	0	0	2	3	4	0	2

Quad no.	Quadrangle name	New federal mining claims					New state mining claims				
		1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
102	Dillingham	0	0	0	0	63	7	32	0	0	121
103	Iliamna	0	0	0	0	0	1,746	294	2	0	2
104	Seldovia	0	0	0	0	0	0	0	2	0	0
107	Icy Bay	0	0	0	0	0	0	3	0	0	0
109	Skagway	0	4	0	1	0	23	3	1	38	1
112	Juneau	199	263	52	10	1	53	1	0	0	0
114	Sitka	0	7	10	0	0	0	0	0	0	0
116	Port Alexander	0	0	0	0	2	0	0	0	0	0
117	Petersburg	267	485	183	98	0	0	0	0	2	0
119	Craig	18	101	3	137	399	18	0	1	0	0
120	Ketchikan	0	2	0	0	0	0	0	0	0	0
121	Dixon Entrance	0	1	14	0	0	0	0	0	0	0
135	Trinity Islands	0	0	0	0	0	40	0	0	74	66
138	Port Moller	0	0	0	0	0	0	0	0	10	0
	TOTALS	**681**	**1,871**	**427**	**308**	**523**	**9,495**	**8,671**	**9,786**	**11,977**	**5,086**

SOURCE: Data provided by Alaska Department of Natural Resources Land Records Information Section and U.S. Bureau of Land Management.

APPENDIX B
Prospecting sites in Alaska 1994–2000

Quad no.	Quad name[a]	1994 New	1994 Total	1995 New	1995 Total	1996 New	1996 Total	1997 New	1997 Total	1998 New	1998 Total	1999 New	1999 Total	2000 New	2000 Total
17	Point Hope	0	8	9	17	0	17	0	15	0	0	0	0	0	0
18	De Long Mountains	0	0	0	0	0	0	0	0	0	0	27	27	72	99
26	Noatak	0	0	24	24	24	48	0	48	0	0	0	0	1	1
27	Baird Mountains	11	18	6	24	8	32	0	32	0	32	0	32	0	32
30	Wiseman	7	18	4	19	63	67	2	23	31	38	0	29	11	13
31	Chandalar	8	26	21	47	4	30	37	60	14	46	14	24	0	23
36	Selawik	0	0	5	5	0	5	0	5	0	5	0	5	0	5
38	Hughes	0	0	0	0	0	0	9	9	0	9	1	10	0	8
42	Black River	0	0	0	0	1	1	0	1	0	0	0	0	0	0
43	Teller	0	0	0	0	0	0	0	0	0	0	0	0	15	15
44	Bendeleben	9	19	5	24	42	60	89	147	4	143	7	136	0	60
45	Candle	0	0	0	0	8	8	13	21	0	20	6	26	32	46
47	Melozitna	7	7	0	7	192	192	0	192	0	192	144	336	0	144
48	Tanana	47	58	78	118	295	401	18	379	5	289	97	337	27	123
49	Livengood	188	273	221	395	62	301	184	407	111	322	20	147	24	123
50	Circle	135	799	211	818	139	641	176	499	201	528	82	443	31	301
52	Nome	13	56	47	83	66	128	63	173	16	139	21	97	37	116
53	Solomon	6	30	18	32	34	59	12	64	5	53	10	40	0	28
55	Nulato	0	2	0	2	4	6	0	6	2	4	22	26	6	32
56	Ruby	0	3	0	3	16	19	57	76	37	113	8	95	0	48
57	Kantishna River	0	3	0	0	0	0	4	4	0	4	0	4	0	4
58	Fairbanks	56	127	73	136	90	193	63	221	49	149	19	105	0	72
59	Big Delta	47	219	92	246	118	244	295	449	1,968	2,301	967	3,152	402	2,683
60	Eagle	25	57	42	80	74	125	52	145	220	336	27	282	75	312
64	Ophir	2	8	3	11	5	9	46	55	0	53	1	39	177	182
65	Medfra	0	9	0	9	11	12	22	34	0	21	2	10	0	3
66	Mt. McKinley	1	1	0	1	0	0	0	0	0	0	0	0	0	0
67	Healy	38	136	12	124	127	152	397	535	245	748	16	597	13	101
68	Mt. Hayes	32	53	15	64	246	273	194	423	73	439	11	397	8	274
69	Tanacross	18	194	18	196	56	93	54	110	22	91	155	219	0	184
73	Iditarod	0	0	0	0	235	235	0	235	0	198	16	171	0	156
74	McGrath	0	0	6	6	19	25	198	218	2	204	16	158	52	65
75	Talkeetna	13	47	11	46	15	38	281	308	63	331	19	282	41	76

[a]Unlisted quadrangles did not have any prospect sites staked during 1994-2000.

SOURCE: Data provided by Alaska Department of Natural Resources Land Records Information Section.

APPENDIX B
Prospecting sites in Alaska 1994-2000

(continued)

Quad no.	Quad name	1994 New	1994 Total	1995 New	1995 Total	1996 New	1996 Total	1997 New	1997 Total	1998 New	1998 Total	1999 New	1999 Total	2000 New	2000 Total
76	Talkeetna Mountains	43	48	34	82	0	79	15	40	58	88	2	88	4	75
77	Gulkana	0	0	0	0	0	0	8	8	0	8	0	8	3	3
78	Nabesna	0	0	0	0	0	0	0	0	0	0	0	0	4	4
81	Russian Mission	0	0	0	0	0	0	46	46	0	46	0	46	0	46
82	Sleetmute	0	0	0	0	0	0	46	46	0	46	0	46	0	26
83	Lime Hills	2	8	0	2	0	0	9	9	0	9	0	0	0	0
84	Tyonek	10	44	0	28	14	28	6	20	0	20	0	14	0	0
85	Anchorage	33	46	51	82	21	84	24	98	5	64	10	64	3	62
86	Valdez	11	35	13	40	9	38	0	27	0	16	0	16	25	41
91	Bethel	0	1	6	6	16	22	4	26	0	12	18	22	0	18
92	Taylor Mountains	0	0	0	0	6	6	0	6	32	38	0	32	0	0
94	Kenai	0	6	0	0	0	0	0	0	0	0	0	0	0	0
95	Seward	0	4	1	1	26	26	2	26	1	20	2	5	0	2
97	Bering Glacier	0	0	0	0	0	0	0	0	2	2	0	2	0	2
102	Dillingham	0	0	0	0	0	0	48	48	0	48	0	44	0	0
103	Iliamna	4	4	0	2	0	0	0	0	0	0	0	0	0	0
104	Seldovia	0	0	0	0	1	1	0	0	0	0	0	0	0	0
105	Blying Sound	0	0	0	0	7	7	0	7	0	7	0	0	0	0
109	Skagway	8	44	4	42	0	0	6	6	4	10	0	4	0	0
115	Afognak	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	Juneau	0	1	0	0	13	13	0	13	0	5	0	5	0	5
123	Sitka	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	Try Islands	36	36	0	28	14	16	0	14	17	31	0	17	14	28
136	Craig	0	1	0	0	0	0	0	0	0	0	0	0	0	0
137	Ketchikan	0	0	0	0	1	1	0	0	0	0	0	0	0	0
TOTALS		**810**	**2,449**	**1,030**	**2,850**	**2,082**	**3,735**	**2,480**	**5,334**	**3,187**	**7,278**	**1,740**	**7,639**	**1,077**	**5,641**

APPENDIX C

Mining licenses issued by and received from the Alaska Department of Revenue and the Alaska Division of Mining, Land & Water, 2000

Entries include in this order: company name (region), address, resource, site of operation, and mining district. Alaska Peninsula Region (APR), Eastern Interior Region (EIR), Northern Region (NR), Southcentral Region (SCR), Southwestern Region (SWR), Southeastern Region (SER), Undistributed (UR), Western Region (WR), and not given (NG).

Alaska Gold Co. (EIR)
PO Box 71170
Fairbanks, AK 99707-1170
Gold
Cleary Creek
Fairbanks mining district

Alaska Gold Co. (WR)
Alaska Gold Co
PO Box 640
Nome, AK 99762-0640
Gold
Anvil Creek
Nome mining district

Alaska Mining Co. Inc. (NR)
PO Box 9-1219
Anchorage, AK 99509-1219
Gold
Hammond River
Koyukuk mining district

AM Mining Ltd. (EIR)
Richard B. Minder
PO Box 10263
Fairbanks, AK 99710-0263
Gold
Dome Creek
Fairbanks mining district

Amm1 Family Ltd. Partnership (NR)
Paradise Valley
Bettles, AK 99726
Gold
Birch Creek
Koyukuk mining district

Applebee, Robert M. (SCR)
4111 E 65th Ave.
Anchorage, AK 99507-2315
Gold
Bear Creek
Hope mining district

AU Mining (EIR)
Richard L. Loud
PO Box 10570
Fairbanks, AK 99710-0570
Gold
Harrison Creek
Circle mining district

Aurora Mining (EIR)
PO Box 103820
Anchorage, AK 99510-3820
Gold
North Fork Harrison Creek
Circle mining district

B&B Mining (NR)
Richard L. Wright
3910 Tilleson Way
North Pole, AK 99705-6555
Gold
Gold Creek
Koyukuk mining district

B&B Mining (NR)
Richard L. Wright
3910 Tilleson Way
North Pole, AK 99705-6555
Gold
Gold Creek
Koyukuk mining district

Bartholomae, Bill A. (WR)
Bill A Bartholomae
PO Box 2701
Orange, CA 92859-2701
Gold
Gold Run Creek
Port Clarence mining district

Bauer, Tod A. (SCR)
Tod A Bauer
PO Box 871502
Wasilla, AK 99687-1502
Gold
Eldorado Creek
Valdez Creek mining district

Beaver State Mining (EIR)
Rebecca McCallum
537 West Yoakum Ave.
Chaitee, MO 63740-1825
Gold
Gold Dust Creek
Circle mining district

Bed Rock Enterprises (EIR)
Charles J. Zimmerman
PO Box 41
Manley Hot Springs, AK 99756
Gold
Killarney Creek
Hot Springs mining district

Beerman, William J. (SCR)
2416 S 1st St.
Yakima, WA 98903-1552
Gold
Big Four Creek
Chistochina mining district

Bergman, Kevin M. (EIR)
PO Box 71488
Fairbanks, AK 99707-1488
Gold
Ester Creek
Fairbanks mining district

Blue Sky Mining (EIR)
Donald T. Kiehl
3210 Marneet Ln.
North Pole, AK 99705-6726
Gold
Gold King Creek
Bonnifield mining district

Blue Water Mining (EIR)
Harold A. Nevers
8148 Pinewood Dr.
Juneau, AK 99801-8906
Gold
American Creek
Fortymile mining district

Boundary 8 (EIR)
C/o Norman Laframboise
100 1328 Commissioner's Rd. W
London Ontario, N6K 2Y6
Gold
Turk Creek
Fortymile mining district

Bouton, Glenn D. (NR)
855 Cranberry Ridge Dr.
Fairbanks, AK 99712-1104
Gold
Chapman Creek
Koyukuk mining district

Bras, Cy (EIR)
703 Swires Rd.
Kenai, AK 99611-8391
Gold
Canyon Creek
Fortymile mining district

Briley, Robert A. (EIR)
PO Box 10585
Fairbanks, AK 99710-1585
Gold
Nugget Creek
Fairbanks mining district

Brooks Range Ventures Inc. (NR)
423 E 5th Ave.
Anchorage, AK 99501-2634
Gold
Lake Creek
Koyukuk mining district

Burns, John R. (EIR)
PO Box 5
Chicken, AK 99732-0005
Gold
Davis Creek
Fortymile mining district

Cache Creek Gold, Inc. (SCR)
Cache Creek Gold, Inc.
Leonard Kragness
1817 Parkside Dr.
Anchorage, AK 99501-5751
Gold
Cache Creek
Yentna mining district

Cache Creek Minerals, Inc. (SCR)
Steven C Amidon
1925 Buckeye Ln.
Wasilla, AK 99654-3125
Gold
Thunder Creek
Yentna mining district

Calista Corporation (SWR)
Calista Corporation
301 Calista Court, Ste. A
Anchorage, AK 99518-3028
Gold
Bear Creek
Aniak mining district

Camp Creek Mining (EIR)
Alvin L. Kile
PO Box 140424
Anchorage, AK 99514-0424
Gold
Canyon Creek
Fortymile mining district

Carlton, Allen (EIR)
6318 97th Dr. NE
Everett, WA 98205-1011
Gold
Mosquito Fork
Fortymile mining district

Cassiterite Placers (EIR)
Jack A. Neubauer
413 Cowles St.
Fairbanks, AK 99701-4434
Gold
Cache Creek
Hot Springs mining district

Chickaman Mining Co. (EIR)
Earl L. Schene
PO Box 70631
743 McGrath Rd
Fairbanks, AK 99707-0631
Gold
Uhler Creek
Fortymile mining district

Chomco Mining & Exploration (EIR)
Lindy L. Raines
1313 Skyline Dr.
Fairbanks, AK 99711-1151
Gold
Lewis Creek
Fairbanks mining district

Christensen, Robert E. (SCR)
Robert E Christensen
PO Box 871075
Wasilla, AK 99687-1075
Gold
Beach Sands
Yakataga mining district

Compass Mining Inc. (NR)
PO Box 72700
Fairbanks, AK 99707-2700
Gold
Linda Creek
Koyukuk mining district

Congdon Construction & Mining (EIR)
Carl J. Congdon
925 Commerce St.
Fairbanks, AK 99709-3917
Gold
Quali Creek
Rampart mining district

Crow Creek Inc. (SCR)
Cynthia D Toohey
2642 Forrest Park Dr.
Anchorage, AK 99517-1326
Gold
Crow Creek
Anchorage mining district

Daugherty, Joe A. (SWR)
Joe A Daugherty
HC 05, Box 9749
Palmer, AK 99645-9509
Gold
Taylor Creek
Aniak mining district

Denali Valley Mines LLC (SCR)
Kevin D. Thompson
PO Box 875534
Wasilla, AK 99687-5534
Gold
Roosevelt Creek
Valdez Creek mining district

Depem (EIR)
Donald R. Stein
105 Dunbar Ave.
Fairbanks, AK 99701-3658
Gold
Gilmore Creek
Fairbanks mining district

Devore, Wesley (EIR)
665 3rd Ave.
Redwood City, CA 94063-3814
Gold
Fortymile River
Fortymile mining district

Double J Mining (EIR)
Judd Edgerton
PO Box 34
Chicken, AK 99732-0034
Gold
Napoleon Creek
Fortymile mining district

Eagan, Peter (EIR)
PO Box 71170
Fairbanks, AK 99707
Gold
Kokomo Creek
Fairbanks mining district

Ellet Management Co. Inc. (EIR)
Michael J. Kingsbury
3535 Lansing Rd.
Charlotte, MI 48813-8446
Gold
Olive Creek
Tolovana mining district

Emerson, Robert C. (EIR)
1811 Phillips Field Rd.
Fairbanks, AK 99701-2706
Gold
N/A
Fairbanks mining district

Felcyn, Tom (EIR)
PO Box 72257
Fairbanks, AK 99707-2257
Gold
Ketchum Creek
Circle mining district

Fichtelman, Guy (EIR)
PO Box 70
Chicken, AK 99732-0070
Gold
Mosquito Fork
Fortymile mining district

Flat Pick Mining Company (EIR)
Gordon Fulton
PO Box 115
Central, AK 99730-9999
Gold
Switch Creek
Circle mining district

Flothe, Glenn M. (SCR)
PO Box 45
Moose Pass, AK 99631-0045
Gold
Quartz Creek
Hope mining district

Four Brothers Mining (EIR)
Henry C. Billings
80 W Gibson St.
Canandaigua, NY 14424-1453
Gold
Totatlanika River
Bonnifield mining district

Frasier, James C. (EIR)
1000 Cannan Dr.
Angleton, TX 77515-3310
Gold
Deadwood Creek
Circle mining district

Gavora, Steve (EIR)
1967 Camomille Ln.
Fairbanks, AK 99712-2926
Gold
Fairbanks Creek
Fairbanks mining district

GeoQuest (EIR)
Michael R. Busby
4481 W Hill Rd.
Homer, AK 99603-8302
Gold
Chicken Creek
Fortymile mining district

Gibson, Wayne E. (EIR)
1610 Southern Ave.
Fairbanks, AK 99709-4229
Gold
Golden Creek
Melozitna mining district

Girdwood Mining Co. (SCR)
Girdwood Mining Co
PO Box 1089
Girdwood, AK 99587-1089
Gold
Crow Creek
Anchorage mining district

Global Outdoors Inc. (WR)
Global Outdoors Inc
43445 Business Park Dr., Ste 113
Temecula, CA 92590-3671
Gold
Cripple River
Nome mining district

Gold Hill Mining Co (SCR)
Derek J Guidotti
PO Box 671727
Chugiak, AK 99567-1727
Gold
Valdez Creek
Valdez Creek mining district

Gold Run Ltd. (WR)
Gold Run Ltd
1250 NE Loop 410 Ste 900
San Antonio, TX 78209-1524
Gold
Gold Run Creek
Port Clarence mining district

Goodson, Richard
Box 125
Eagle, AK 99738
Gold
Seventymile River
Eagle mining district

Goresen, Edmund J. (SCR)
Edmund J Goresen
PO Box 91
Seward, AK 99664-0091
Gold
Tonsina Creek
Seward mining district

Granath, Gene Alfred (SCR)
Gene Alfred Granath
Box 574
Kenai, AK 99611-0574
Gold
Falls Creek
Seward mining district

Greenhorn Mining (EIR)
Stanley M. Gelvin
PO Box 30149
Central, AK 99730-0149
Gold
Crooked Creek
Circle mining district

Greenhorn Mining (EIR)
Stanley M. Gelvin
PO Box 30149
Central, AK 99730-0149
Gold
Crooked Creek
Circle mining district

Gumaer, Mark (WR)
Mark Gumaer
PO Box 1682
Nome, AK 99762-1682
Gold
Dick Creek
Kougarok mining district

Gustafson, Aaron B. (WR)
Aaron B Gustafson
8355 N Stony Mountain Way
Flagstaff, AZ 86001-7824
Gold
Norton Sound
Nome mining district

Hall Creek Mining Inc (EIR)
Ralph R. Richardson
PO Box 4589

Palmer, AK 99645-4589
Gold
Hall Creek
Fortymile mining district

Ham Mining (EIR)
Harold Mitchell
RR 1 Box 287
Baraga, MI 49908-9749
Gold
Mosquito Fork
Fortymile mining district

Hanks, G.A. (EIR)
Box 2533 Hwy 16
West Sacramento, CA 95691
Gold
Lost Chicken Creek
Fortymile mining district

Hayden Exploration & Mining (EIR)
Forest A. Hayden
PO Box 110930
Anchorage, AK 99511-0930
Gold
Kal Creek
Fortymile mining district

Hayden Exploration & Mining (EIR)
Forest A. Hayden
PO Box 110930
Anchorage, AK 99511-0930
Gold
Squaw Gulch
Fortymile mining district

Heflinger Mining and Equipment (EIR)
Robert (Bob) Kirsch
PO Box 826
Kenai, AK 99611-0826
Gold
Wilson Creek
Fortymile mining district

Heflinger, Fred (EIR)
PO Box 82390
Fairbanks, AK 99708-2390
Gold
Walker Fork
Fortymile mining district

Hron, Thomas G. (SCR)
Thomas G Hron
7540 Foxridge Way, Unit A
Anchorage, AK 99518-2784
Gold
Lake Creek
Yentna mining district

Hunter Creek Mine (EIR)
Steve Losonsky
PO Box 80321
Fairbanks, AK 99708-0321
Gold
Hunter Creek
Rampart mining district

Jackson Mining Company (EIR)
Roy E. Traxler
950 Tok St.
Fairbanks, AK 99709-4808
Gold
Totatlanika River
Bonnifield mining district

Jackson, O.L. (NR)
PO Box 248
La Center, WA 98629-0248
Gold
Jennie Creek
Koyukuk mining district

Jacobs, David W. (EIR)
HC 1 Box 3090
Healy, AK 99743-9603
Gold
Rex Creek
Bonnifield mining district

Jacobs, David W. (EIR)
HC 1 Box 3090
Healy, AK 99743-9603
Gold
Eva Creek
Bonnifield mining district

Jensen, Daniel D. (EIR)
PO Box 12
Delta Junction, AK 99737-0012
Gold
McCumber Creek
Delta River mining district

Jiles, Overton Jackson (NR)
274 W. Spruce Ave.
Wasilla, AK 99654-5401
Gold
Gold Bottom Creek
Koyukuk mining district

KC Mining Company (EIR)
Kenneth C. Hanson
PO Box 10657
Fairbanks, AK 99710-0657
Gold
Faith Creek
Circle mining district

Keller, Robert W. (EIR)
PO Box 385
Huntington, OR 97907-0385
Gold
Totatlanika River
Bonnifield mining district

Kelly Mining (EIR)
Timothy J. Kelly
7441 Margaret Circle
Anchorage, AK 99518-2044
Gold
North Fork Creek
Hot Springs mining district

Klatt Aggregate, Inc. (EIR)
Marin Lovs
2326 St. Elias Dr.
Anchorage, AK 99517-1247
Gold
Mammoth Creek
Circle mining district

Koppenberg Mining & Management (EIR)
Samuel A. Koppenberg
PO Box 80067
Fairbanks, AK 99708-0067
Gold
Faith Creek
Circle mining district

Kralik, Janos (WR)
Janos Kralik
PO Box 1793
Nome, AK 99762-1793
Gold
Norton Sound
Nome mining district

Krutzsch, Betty W. (WR)
Betty W Krutzsch
971 Borden Rd. Spc 132
San Marcos, CA 92069-2153
Gold
Anvil Creek
Nome mining district

Kukowski, David G. (EIR)
3311 West 83rd Ave.
Anchorage, AK 99502-4434
Gold
Mosquito Fork
Fortymile mining district

Kyllo, Jerry (EIR)
PO Box 419
Tok, AK 99780-0419
Gold
Bullion Creek
Fortymile mining district

Lambert, Howard C. (EIR)
PO Box 1386
Aspen, CO 81612-1386
Gold
Amazing Grace Creek
Fortymile mining district

Lee, Kenneth A. (SCR)
Kenneth A Lee
PO Box 1275
Kenai, AK 99611-1275
Gold
Cache Creek
Yentna mining district

Lillian Creek Mines (EIR)
Ronald K. Tucker
PO Box 60334
Fairbanks, AK 99706-0334
Gold
Lillian Creek
Tolovana mining district

Limited Partnership Busch Creek (SCR)
Robert L Titchenal
4501 Montrose Circle
Anchorage, AK 99515-1138
Gold
Busch Creek
Valdez Creek mining district

Livengood Placers Inc (EIR)
626 Second St., Ste. 202a
Fairbanks, AK 99701-3466
Gold
Livengood Creek
Tolovana mining district

Lopetrone, Robert J. (EIR)
2600 E 112th Ave.
Anchorage, AK 99516-1422
Gold
Montana Creek
Fortymile mining district

Lounsbury, James G. (NR)
365 Henderson Rd.
Fairbanks, AK 99709-2347
Gold
Union Gulch
Koyukuk mining district

Mastel, Fred W. (SCR)
Fred W. Mastel
6400 O'Malley Road
Anchorage, AK 99516-1803
Gold
Quartz Creek
Hope mining district

Mayo, Edward F. (EIR)
PO Box 30053
Central, AK 99730
Gold
Deadwood Creek
Circle mining district

Mcfarland, Frank (WR)
Frank Mcfarland
PO Box 364
Nome, AK 99762-0364
Gold
Norton Sound
Nome mining district

McGriff, Gordon (EIR)
230 NE Oakdale Dr.
Grants Pass, OR 97526-3434
Gold
Harrison Creek
Circle mining district

McKibben, H.R., Estate of (EIR)
C/O Allen McKibben
PO Box 96
Grass Range, MT 59032-0096
Gold
Wolf Creek
Fairbanks mining district

Miscovich, Andrew W. (NR)
PO Box 71489
Fairbanks, AK 99707-1489
Gold
Porcupine Creek
Koyukuk mining district

Mitchell, Joseph D. (EIR)
RR 1 Box 322
Brookville, PA 15825-9721
Gold
Fortymile River
Fortymile mining district

Mitchell, Joseph D. (EIR)
RR 1 Box 322
Brookville, PA 15825-9721
Gold
Fortymile River
Fortymile mining district

Mitchell, Paul R. (EIR)
37800 Joy Rd.
Livonia, MI 48150-3430
Gold
Eagle Creek
Fortymile mining district

Moore, Monty D. (EIR)
10735 Stone Ave. N
Seattle, WA 98133-8923
Gold
Broxson Gulch
Delta River mining district

Mrak Placer Mine (SCR)
Mrak Aklestad Hermon & Hermon
PO Box 1963
Palmer, AK 99645-1963
Gold
Willow Creek
Willow Creek mining district

Mud Creek Mining Corp. (WR)
Mud Creek Mining Corp
HC 1 Box 109
White Bird, ID 83554-9709
Gold
Mud Creek
Fairhaven mining district

MVM Associates (EIR)
Nickolaj Marchuk
PO Box 89
Delta Junction, AK 99737-0089
Gold
Rainy Creek
Delta River mining district

N B Tweet & Sons (WR)
N B Tweet & Sons
PO Box 1107
Nome, AK 99762-1107
Gold
Kougarok River
Kougarok mining district

Nordeen, William H. (NR)
887 Bouton Court
Fairbanks, AK 99712-1448
Gold
Emma Creek
Koyukuk mining district

North Creek Mining Co. (SCR)
Arnold J Mason
PO Box 140467
Anchorage, AK 99514-0467
Gold
Willow Creek
Nelchina mining district

Northern Bonanza (SWR)
Richard L Busk
PO Box 190649
Anchorage, AK 99519-0649
Gold
Syneva Creek
Aniak mining district

Northern Lights Mining Inc. (NR)
544 N 600 W
Cedar City, UT 84720-2111
Gold
Rye Creek
Koyukuk mining district

Northland Minerals Inc. (SCR)
Leonard Kragness
1817 Parkside Dr.
Anchorage, AK 99501-5751
Gold
Cache Creek
Yentna mining district

Nova Resources (WR)
Nova Resources
PO Box 640
Nome, AK 99762-0640
Gold
Dry Creek
Nome mining district

Olson, Gordon E. (EIR)
7100 N. Milford Rd.
Holly, MI 48442-8563
Gold
Jack Wade Creek
Fortymile mining district

Olson, Stephen (Ole) G. (EIR)
PO Box 106
Tok, AK 99780-0106
Gold
Liberty Creek
Fortymile mining district

Omega Mining Co. (EIR)
Richard K. Ott
PO Box 72748
Fairbanks, AK 99707-2748
Gold
Omega Creek
Hot Springs mining district

Osborne, Richard Hazelet (SCR)
PO Box 2349
Port Angeles, WA 98362
Gold
Ruby Gulch
Chistochina mining district

Oudekerk, James A. (EIR)
PO Box 351
Healy, AK 99743-0351
Gold
Rex Creek
Bonnifield mining district

Owen, Ted (EIR)
12307 E. Stillwater Way
Redding, CA 96003-8787
Gold
Walker Fork
Fortymile mining district

P&E Mining Inc. (EIR)
Samuel E. Eaves
PO Box 10357
Fairbanks, AK 99710-0357
Gold
Livengood Creek
Tolovana mining district

Paystreak Mining (EIR)
Michael Bucy
3638 Dunkirk Dr.
Anchorage, AK 99502-3060
Gold
Warner Creek
Fortymile mining district

Polar Mining Inc. (EIR)
4545 Wood River Dr.
Fairbanks, AK 99709-3404
Gold
Goldstream Creek
Fairbanks mining district

Polley, Everett J., Jr. (EIR)
10809 Oreland Mill Rd.
Louisville, KY 40229-2427
Gold
South Fork Fortymile River
Fortymile mining district

Prince Creek Mining Co. (SWR)
Alvin H Agoff
PO Box 2791
Palmer, AK 99645-2791
Gold
Prince Creek
Iditarod mining district

Pushcar, Jerry (WR)
Jerry Pushcar
PO Box 1604
Nome, AK 99762-1604
Gold
Iron Creek
Kougarok mining district

R.B. Gravel Sales (EIR)
Gerald L. Hassel
PO Box 49
Ester, AK 99725-0049
Gold
Ready Bullion Creek
Fairbanks mining district

Redmond Mining Company (WR)
Richard J Redmond
PO Box 8700
Indian, AK 99540-8700
Gold
Macklin Creek
Kougarok mining district

Reed, Scott C. (EIR)
PO Box 121
Eagle, AK 99738-0121
Gold
North Fork Fortymile
Fortymile mining district

Regner, Leo A. (EIR)
PO Box 72733
Fairbanks, AK 99707-2733
Gold
Lilliwig Creek
Fortymile mining district

Roberts, Robert W. (EIR)
PO Box 225
Tok, AK 99780-0225
Gold
Chicken Creek
Fortymile mining district

Rock Laundry Mining (EIR)
D. Bruce Catt
PO Box 45
Central, AK 99730-0045
Gold
Crooked Creek
Circle mining district

Rosander Mining Company Inc. (WR)
Rosander Mining Company Inc
PO Box 129
Mcgrath, AK 99627-0129
Gold
Colorado Creek
Innoko mining district

Sather, Steven P. (EIR)
1488 Holy Cross Dr.
Fairbanks, AK 99709-6765
Gold
Fairbanks Creek
Fairbanks mining district

Sayer, Paul (WR)
Paul Sayer
PO Box 10
Homer, AK 99603-0010
Gold
10 Pup Little Creek
Innoko mining district

Scofield, Walter P (EIR)
PO Box 945
Tok, AK 99780-0945
Gold
South Fork Fortymile
Fortymile mining district

Scott Hunt Properties (EIR)
1944 Old Steese Hwy N.
Fairbanks, AK 99712-1018
Gold
Phelan Creek
Delta River mining district

Seuffert Mining (EIR)
George W. Seuffert Jr.
PO Box 68
Chicken, AK 99732-0068
Gold
Chicken Creek
Fortymile mining district

Shupe, Michael C. (NR)
1035 W Northern Lights Blvd.
Anchorage, AK 99503-2409
Gold
Boulder Creek
Koyukuk mining district

Silverado Mines (US) Inc. (NR)
505 - 1111 W Georgia St.
Vancouver, BC V6E 3M3
Gold
Nolan Creek
Koyukuk mining district

Sitnasuak Native Corp. (WR)
Sitnasuak Native Corp
PO Box 905
Nome, AK 99762-0905
Gold
Grass Creek
Nome mining district

Skookum Mining (EIR)
John H. Cole
PO Box 10139
Fairbanks, AK 99710-0139
Gold
Portage Creek
Circle mining district

Slate Creek Mining Co (EIR)
315 S Pearl St.
Centralia, WA 98531-4010
Gold
Slate Creek
Rampart mining district

Soule, Harold L. (SCR)
Harold L Soule
2840 E 142nd Ave.
Anchorage, AK 99516-3903
Gold
Windy Creek
Yentna mining district

State of Alaska, Mining, Land, & Water (WR)
3700 Airport Way
Fairbanks, AK 99709-4699
Gold
Norton Sound
Nome mining district

State of Alaska, Mining, Land, & Water (WR)
3700 Airport Way
Fairbanks, AK 99709-4699
Gold
Norton Sound
Nome mining district

State of Alaska, Mining, Land, & Water (WR)
3700 Airport Way
Fairbanks, AK 99709-4699
Gold
Norton Sound
Nome mining district

Stevens, Andrea A. (SWR)
Andrea A Stevens
621 Highview Dr.
Anchorage, AK 99515-3718
Gold
Marvel Creek
Aniak mining district

Suckow, Ronald Lewis (EIR)
2136 Old Steese Hwy N.
Fairbanks, AK 99712
Gold
Half Dollar Creek
Circle mining district

Swarthout, Ralph J. (SCR)
Ralph J Swarthout
PO Box 141801
Anchorage, AK 99514-1801
Gold
Beach Sands
Yakataga mining district

Swenson, Lloyd D. (NR)
1843 Bridgewater Dr.
Fairbanks, AK 99709-4102
Gold
Slate Creek
Koyukuk mining district

Swenson, Richard A. (EIR)
PO Box 16205
Two Rivers, AK 99716-0205
Gold
Doric Creek
Hot Springs mining district

Taiga Mining Co. Inc. (WR)
Taiga Mining Co Inc
PO Box 113108
Anchorage, AK 99511-3108
Gold
Bear Creek
Hughes mining district

Taiga Mining Co. Inc. (WR)
Taiga Mining Co Inc
PO Box 113108
Anchorage, AK 99511-3108
Gold
Dry Creek
Hughes mining district

Taylor, Larry R. (EIR)
PO Box 101
Eagle, AK 99738-0101
Gold
Fortymile River
Fortymile mining district

Thurman Oil & Mining (EIR)
James L. Thurman
925 Aurora Dr.
Fairbanks, AK 99709-5538
Gold
American Creek
Hot Springs mining district

Thurneau, Vernon A. (EIR)
1573 Farmers Loop Rd.
Fairbanks, AK 99709-6707
Gold
Fortymile River
Fortymile mining district

Tommy Van Inc. (EIR)
Tom C. Van Ostrand
PO Box 314
Healy, AK 99743-0314
Gold
Platt Creek
Bonnifield mining district

Treasure Creek Mining (EIR)
Donald M. Read
PO Box 71638
Fairbanks, AK 99707-1638
Gold
Treasure Creek
Fairbanks mining district

Treasure Creek Mining (EIR)
Donald M. Read
PO Box 71638
Fairbanks, AK 99707-1638
Gold
Vault Creek
Fairbanks mining district

Treesh, James W. (EIR)
18550 Man O War Rd.
Eagle River, AK 99577-8335
Gold
Cherry Creek
Fortymile mining district

Tru Deck Mining (EIR)
James L. Decker
PO Box 135
Healy, AK 99743-0135
Gold
Sheep Creek
Bonnifield mining district

Tundra Explorations (WR)
Estate Of Rhinehart M Berg/
Thorleif Wetlesen
C/O Wallis W. Brooks
325 Garrison Way
Gulph Mills, PA 19428
Gold
Candle Creek
Fairhaven mining district

Turner, Martin A. (WR)
Martin A Turner
854 Valle Vista Ave.
Vallejo, CA 94590-3543
Gold
Norton Sound
Nome mining district

Vogler, Joseph E., Estate of (EIR)
PO Box 70040
Fairbanks, AK 99707-0040
Gold
Ketchum Creek
Circle mining district

Vogler, Lynn (EIR)
PO Box 70040
Fairbanks, AK 99707-0040
Gold
Ketchum Creek
Circle mining district

Wade, Mike L. (WR)
Mike L Wade
PO Box 1623
Nome, AK 99762
Gold
Canyon Creek
Nome mining district

Watts, Donald L. (EIR)
PO Box 81515
College, AK 99708-1515
Gold
Grubstake Creek
Bonnifield mining district

Watts, Donald L. (EIR)
PO Box 81515
College, AK 99708-1515
Gold
Grubstake Creek
Bonnifield mining district

Weathers, Douglas L. (SCR)
Douglas L Weathers
PO Box 8082
Nikiski, AK 99635-8082
Gold
Cache Creek
Yentna mining district

White Bear Mining (SWR)
Harry E Faulkner Sr
PO Box 1307
Bethel, AK 99559-1307
Gold

Ophir Creek
Aniak mining district

Wicken, James T. (NR)
1709 Central Ave.
Fairbanks, AK 99709-4220
Gold
Gold Creek
Koyukuk mining district

Wiggers, Dan A. Sr., Estate of (NR)
HC 30 Box 5382
Wasilla, AK 99654-9712
Gold
Hammond River
Koyukuk mining district

Wilder, Karen (EIR)
107 7th Avenue #2
Fairbanks, AK 99701-5063
Gold
Little Boulder Creek
Hot Springs mining district

Wilkes, Fred M. (SCR)
Fred M Wilkes
205 E Dimond, Box 276
Anchorage, AK 99515
Gold
Bird Creek
Yentna mining district

Williams, Michael A. (EIR)
PO Box 603
Tok, AK 99780-0603
Gold
Kenyon Creek
Fortymile mining district

Wilmarth, Richard C. (SWR)
Richard C Wilmarth
PO Box 33
Red Devil, AK 99656-0033
Gold
Chicken Creek
Iditarod mining district

Wolff, Margaret (EIR)
PO Box 56331
North Pole, AK 99705-1331
Gold
Walker Fork
Fortymile mining district

Wood, James L. (EIR)
13302 ½ S Bridge Ave.
Yuma, AZ 85365-9772
Gold
Little Boulder Creek
Hot Springs mining district

Wrede, Ronald J. (EIR)
2116 NE 80th St.
Seattle, WA 98115-4538
Gold
Switch Creek
Circle mining district

Wyrick, L.E. (SWR)
L E Wyrick
PO Box 782
Willow, AK 99688-0782
Gold
Granite Creek
Aniak mining district

Younger Creek Mining Co. (EIR)
James R. Gerth
1182 Copper St.
North Pole, AK 99705-5777
Gold
Younger Creek
Fortymile mining district

Zimmer, George W. (SCR)
George W Zimmer
PO Box 572
Cooper Landing, AK 99572-0572
Gold
Quartz Creek
Seward mining district

APPENDIX D

Selected significant mineral deposits and mineral districts in Alaska[a]

The alphabetized list of mineral deposits and mineral districts is keyed to the list of explanatory paragraphs that follow. For example, The Lik deposit in the alphabetized list is "**Lik,** 1, (fig. D-1)." This says that the location of Lik is shown as number 1 in figure D-1.

Alaska-Juneau, 100, (fig. D-3).
Anderson Mountain, 54, (fig. D-1).
Aniak district, 84, (fig D-3).
Apex-El Nido, 104, (fig. D-3).
Apollo-Sitka mines, 86, (fig. D-3).
Arctic, 9, (fig. D-1).
Avan Hills, 12, (Fig. D-3).
Baultoff, 75, (fig. D-2).
Bear Mountain, 21, (fig. D-2).
Big Creek/Ladue, 58, (fig. D-1).
Big Hurrah, 32, (fig. D-3).
Binocular and other prospects, 72, (fig. D-1).
Bohemia Basin, 103, (fig. D-3).
Bokan Mountain, 122, (fig. D-3).
Bonanza Creek, 45, (fig. D-2).
Bond Creek, 73, (fig. D-2).
Bonnifield district massive sulfide deposits, 54, (fig. D-1).
Bornite, 8, (fig. D-1).
Brady Glacier, 98, (fig. D-3).
BT, 54, (fig. D-1).
Buck Creek, 23, (fig. D-2).
Calder Mine, 133, (fig D-2).
Cape Creek, 22, (fig. D-2).
Carl Creek, 74, (fig. D-2).
Casca VABM, 53, (fig. D-1).
Castle Island, 111, (fig. D-1).
Chandalar mining district, 17, (fig. D-3).
Chichagof, 101, (fig. D-3).
Chistochina, 68, (figs. D-2, D-3).
Circle mining district, 52, (fig. D-3).
Claim Point, 82, (fig. D-3).
Coal Creek, 63, (fig. D-2).
Copper City, 119, (fig. D-1).
Cornwallis Peninsula, 110, (fig. D-1).
Council mining district, 33, (fig. D-3).
Delta massive sulfide belt, 55, (fig. D-1).
Denali prospect, 67, (fig. D-1).
Dolphin, 49e, (fig. D-3).
Donlin Creek, 137, (fig. D-3).
Drenchwater, 3, (fig. D-1).
Dry Creek, 54, (fig. D-1).
Eagle Creek, 34, (fig. D-3).
Ear Mountain, 25, (fig. D-2).
Ellamar, 78, (fig. D-1).
Ernie Lake (Ann Creek), 15, (fig. D-1).
Esotuk Glacier, 20, (fig. D-2).
Fairbanks mining district, 49, (fig. D-3).
Fairhaven/Inmachuk district, 39, (fig. D-3).
Fort Knox, 49a, (fig. D-3).
Fortymile mining district, 60, (fig. D-3).
Frost, 7a, (fig. D-1).
Funter Bay mining district, 99, (fig. D-3).
Galena Creek, 21a, (fig. D-1).
Gil Claims, 49f, (fig. D-3).
Ginny Creek, 4, (fig. D-1).
Golden Zone mine, 64, (figs. D-1, D-3).
Goodnews Bay, 85, (fig. D-3).
Grant Mine, 49c, (fig. D-3).
Greens Creek, 105, (fig. D-1).
Groundhog Basin, 112, (fig. D-1).
Haines Barite/Palmer, 95, (fig. D-1).
Hannum, 27, (fig. D-1).
Hirst Chichagof, 101, (fig. D-3).
Horsfeld, 76, (fig. D-2).
Hot Springs mining district, 47, (figs. D-2, D-3).
Hyder mining district, 117, (figs. D-1, D-2).
Iditarod district, 43, (fig. D-3).
Illinois Creek, 132, (figs. D-1, D-3).
Independence, 79, (fig. D-3).
Independence Creek, 28, (fig. D-1).
Inmachuk River, 39, (fig. D-3).
Innoko-Tolstoi mining district, 44, (fig. D-3).
Ivanof, 88, (fig. D-2).
Jimmy Lake, 94, (fig. D-1).
Johnson River, 125, (fig. D-3).
Jualin, 128, (fig. D-3).
Jumbo, 118, (fig. D-1).
Kaiyah, 138, (fig. D-3).
Kantishna mining district, 61, (fig. D-3).
Kasaan Peninsula, 114, (fig. D-1).
Kasna Creek, 92, (fig. D-1).
Kemuk Mountain, 123, (fig. D-3).
Kennecott deposits, 71, (fig. D-1).
Kensington, 127, (fig. D-3).
Kivliktort Mountain, 5a, (fig. D-1).
Klery Creek, 14, (fig. D-3).
Klukwan, 96, (fig. D-3).
Kougarok Mountain, 26, (fig. D-2).
Koyukuk-Hughes mining district, 42, (fig. D-3).
Koyukuk-Nolan mining district, 16, (fig. D-3).
Latouche, Beatson, 80, (fig. D-1).
Liberty Belle, 54, (fig. D-1).
Lik, 1, (fig. D-1).
Livengood-Tolovana mining district, 48, (fig. D-3).
Lost River, 24, (fig. D-2).
Lucky Shot, 79, (fig. D-3).
McLeod, 124, (fig. D-2).
Mertie Lode, 99, (fig. D-3).
Midas mine, 77, (fig. D-1).
Mike deposit, 90, (fig. D-2).
Mirror Harbor, 102, (fig. D-3).
Misheguk Mountain, 13, (fig. D-3).
Mosquito, Peternie, 56, (fig. D-2).
Mt. Prindle, 50, (fig. D-3).
Nabesna mine, 69, (fig. D-3).
Niblack, 121, (fig. D-1).
Nim prospect, 65, (fig. D-1).
Nimiuktuk River, 126, (fig. D-1).
Nixon Fork, 135, (fig. D-3).
Nome mining district, 30, (fig. D-3).
Nunatak, 97, (fig. D-2).
Omalik, 35, (fig. D-1).
Omar, 7, (fig. D-1).
Orange Hill, 73, (fig. D-2).
Pebble Copper, 129, (fig. D-1).
Placer River, 38, (fig. D-2).
Pleasant Creek, 53, (fig. D-1).
Pogo, 130, (fig. D-3).
Poovookpuk Mountain, 40, (fig. D-2).
Porcupine Lake, 18, (fig. D-2).
Purcell Mountain, 41, (fig. D-2).
Pyramid, 87, (fig. D-2).
Quartz Creek, 37, (fig. D-1).
Quartz Hill, 120, (fig. D-2).
Red Bluff Bay, 109, (fig. D-3).
Red Devil, 83, (fig. D-3).
Red Dog, 2, (fig. D-1).
Red Mountain, 82, (fig. D-3).
Rex deposit, 91, (fig. D-2).
Rock Creek, 31, (fig. D-3).
Rua Cove, 81, (fig. D-1).
Ruby mining district, 46, (fig. D-3).
Ryan Lode, 49b, (fig. D-3).
Salt Chuck, 115, (fig. D-3).
Sheep Creek, 54, (fig. D-1).
Shotgun Hills, 131, (fig. D-3).
Sinuk River region, 29, (fig. D-1).
Slate Creek, 59, (fig. D-3).
Sleitat Mountain, 93, (fig. D-2).
Smucker, 11, (fig. D-1).
Snettisham, 107, (fig. D-3).
Snipe Bay, 113, (fig. D-3).
Solomon mining district, 33, (fig. D-3).
Spirit Mountain, 70, (fig. D-3).
Stampede mine, 62, (fig. D-3).
Story Creek, 5, (fig. D-1).
Sumdum, 106, (fig. D-1).
Sun, 10, (fig. D-1).
Taurus, 57, (fig. D-2).
Three Castle Mountain, 53, (fig. D-1).
Tracy Arm, 108, (fig. D-1).
True North, 49d, (fig. D-3).
Twin Mountain, 51, (fig. D-2).
Union Bay, 116, (fig. D-3).
Valdez Creek district, 66, (fig. D-3).
Vinasale Mountain, 134, (fig. D-3).
Virginia Creek, 54, (fig. D-1).
Von Frank Mountain, 136, (fig. D-3).
War Baby, 79, (fig. D-3).
Weasel Mountain, Bee Creek, 89, (fig. D-2).
Whoopee Creek, 6, (fig. D-1).
Willow Creek, 79, (fig. D-3).
Wind River, 19, (fig. D-1).
Windy Creek, 36, (fig. D-2).
Zackly, 67a, (fig. D-1).

[a]This generalized summary does not describe all of the known 6,400 mineral deposits in Alaska.

NOTE: In cooperation with DGGS and the Russian Academy of Sciences, the USGS published Open-File Report 93-339 (Nokleberg and others, 1993), *Metallogenesis of mainland Alaska and the Russian northeast*, which describes 273 lode deposits and 43 significant placer districts in Alaska.

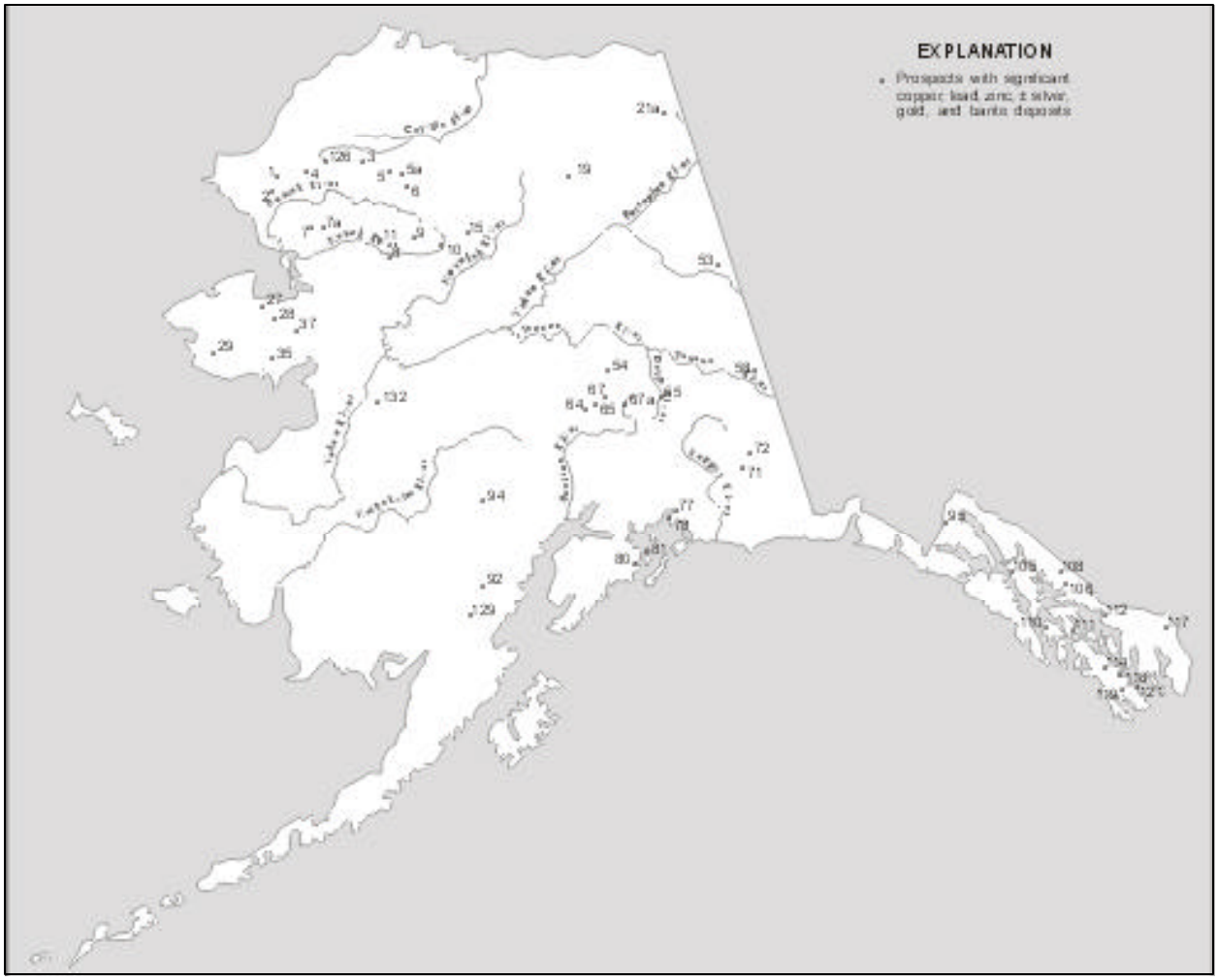


Figure D-1. *Significant copper, lead, zinc with credits of silver, gold, and barite deposits in Alaska, 1999.*

Map no.

1 **Lik**—Major stratabound massive sulfide (Zn–Pb–Ag–Ba) deposit in black shale and chert. Proven reserve (Lik) estimate of 24 million tons of 9% Zn, 3.1% Pb, and 1.4 oz/ton Ag (fig. D-1).

2 **Red Dog**—At least five major stratabound massive sulfide deposits hosted in Pennsylvanian or Mississippian shale; similar to locality 1. (a) The Main deposit at Red Dog contains 46.2 million tons of proven ore grading 19.2% Zn, 5.2% Pb, with 2.92 oz/ton Ag. (b) The Aqqaluk deposit contains probable, indicated, and inferred reserves of 73.0 million tons grading 15.2% Zn, 4.03% Pb, and 2.17 oz/ton Ag. (c) The Qanaiyaq (formerly named Hilltop) deposit with an indicated reserve is 10.6 million tons grading 17.8% Zn, 5.5% Pb, and 3.41 oz/ton Ag. (d) Inferred resource in the Paalaaq deposit is 14.3 million tons of 15.0% Zn, 4.0% Pb, and 2.63 oz/ton Ag. (e) Anarraq deposit discovered in 1999 has an inferred reserve of 19.0 million tons of 15.8% Zn, 4.8% Pb, and 2.07 oz/ton Ag (fig. D-1).

3 **Drenchwater**—Mississippian and Pennsylvanian shales and cherts contain three stratabound base metal occurrences spatially related to acid volcanics. The lowest unit, a siliceous mudstone, contains a 2 ft layer with up to 23% Zn. An overlying gray chert contains up to 11% Zn and up to 5% Pb with some Ag in fracture fillings. At the top of the overlying tuffaceous layer, Ag-bearing Zn and Pb mineralization outcrops discontinuously for at least 6,500 ft, and contains up to 26% Zn and 51% Pb in grab samples (fig. D-1).

4 **Ginny Creek**—Epigenetic, disseminated Zn–Pb–Ag deposits with barite in sandstone and shale of Noatak Sandstone of Late Devonian through Early Mississippian age. Random grab samples of surface float contain 0.3% to 3.0% Zn and highly variable amounts of Pb and Ag (fig. D-1).

5 **Story Creek**—Epigenetic replacement deposits of Zn–Pb–Ag–Cu–Au hosted in brecciated zones in Devonian Kanayut Conglomerate or Lower Mississippian Kayak Shale. Grab samples of high-grade material contain up to

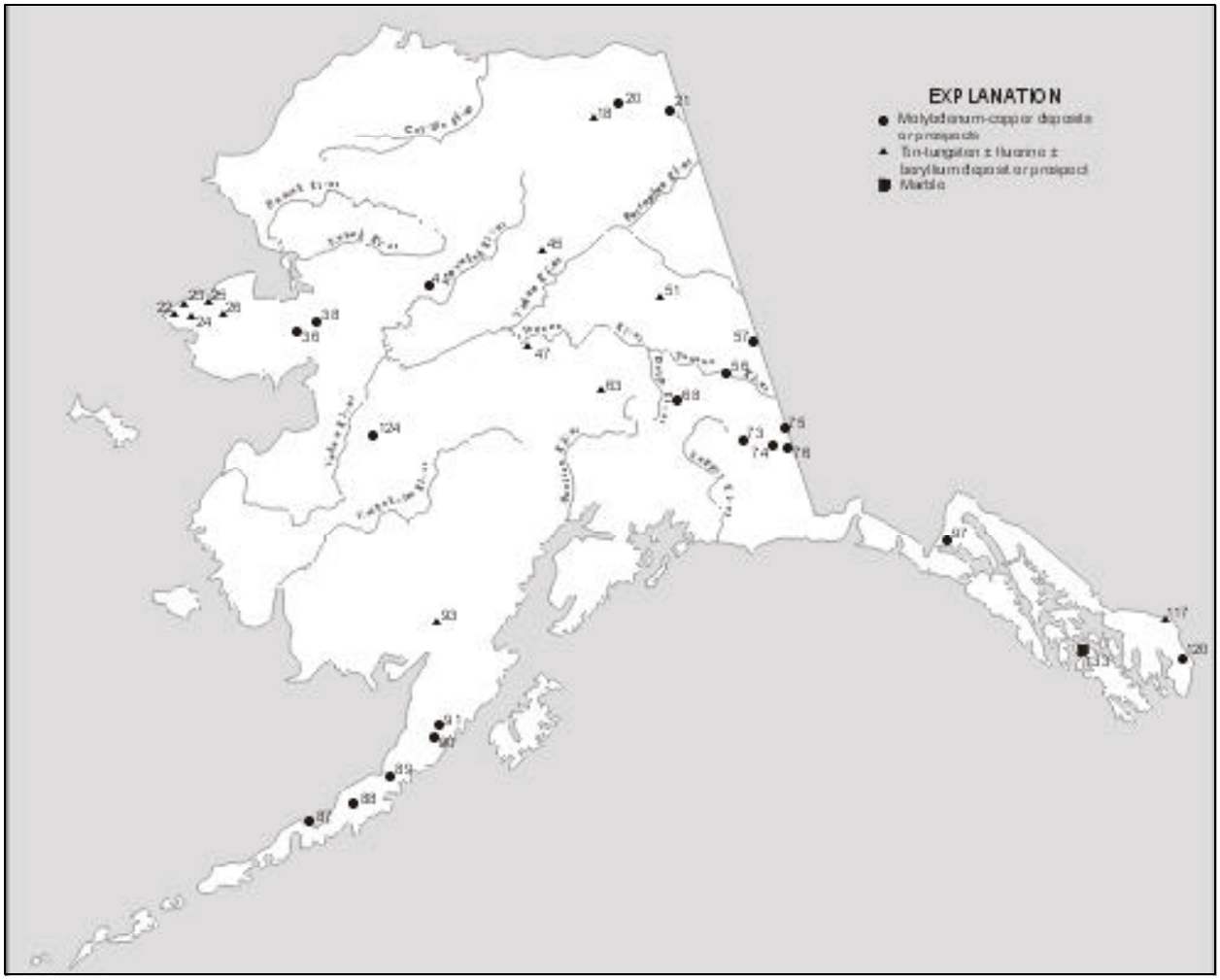


Figure D-2. *Significant molybdenum–copper and tin–tungsten with credits of fluorite and beryllium deposits in Alaska, 1999.*

0.43% Cu, 34% Pb, 28.8% Zn, 0.04 oz/ton Au, and 30 oz/ton Ag (fig. D-1).

5a **Kivliktort Mountain**—Mineralized float is widespread on the north flanks of the mountain, apparently spatially related to the contact between shales at the base of the hills and coarse-grained siliceous clastic rocks on the upper slopes. Rock samples containing up to 30% Zn have been reported (fig. D-1).

6 **Whoopee Creek**—Epigenetic replacement deposits of Zn–Pb–Cu–Ag–Au–Cd in breccia zones in Devonian Kanayut Conglomerate or Lower Mississippian Kayak Shale. Random grab samples of mineralized material contain 0.24% Cu, 0.37% Cd, 46% Zn, 44% Pb, 0.14 oz/ton Au, and 14.8 oz/ton Ag (fig. D-1).

7 **Omar**—Epigenetic replacement deposits of Paleozoic age; include bedded barite occurrences. Grab samples contain 15.3% Cu, 0.15% Pb, 0.95% Zn, 0.05% Co, and 0.3 oz/ton Ag. BLM estimates 35 million tons of 4% Cu (fig. D-1).

7a **Frost**—Possible 9 million tons of barite in pods, lenses, and wavy-banded quartz-calcite-barite veins. Chalcopyrite and galena occur in the veins which cross cut Paleozoic limestone and dolomite for a minimum distance of 1 mi. Selected samples contain up to 13.2% Zn (fig. D-1).

8 **Bornite**—Major stratabound Cu–Zn deposit in brecciated carbonate rock of Devonian age; 5.0 million ton orebody contains 4.0% Cu and accessory Zn and Co. Larger reserve estimate of 40 million tons of about 2% Cu and undisclosed amount of Zn and Co. At grade of 1.2% Cu, reserves are 100 million tons (fig. D-1).

9 **Arctic**—Major volcanogenic (Cu–Zn) massive sulfide deposit hosted in sequence of metarhyolite, metatuff, and graphitic schist of Devonian age; indicated reserves of 40 million tons grade 4.0% Cu, 5.5% Zn, 0.8% Pb, 1.6 oz/ton Ag, and 0.02 oz/ton Au (fig. D-1).

10 **Sun**—Major (Cu–Pb–Zn–Ag) massive sulfide deposit in sequence of middle Paleozoic metarhyolite and

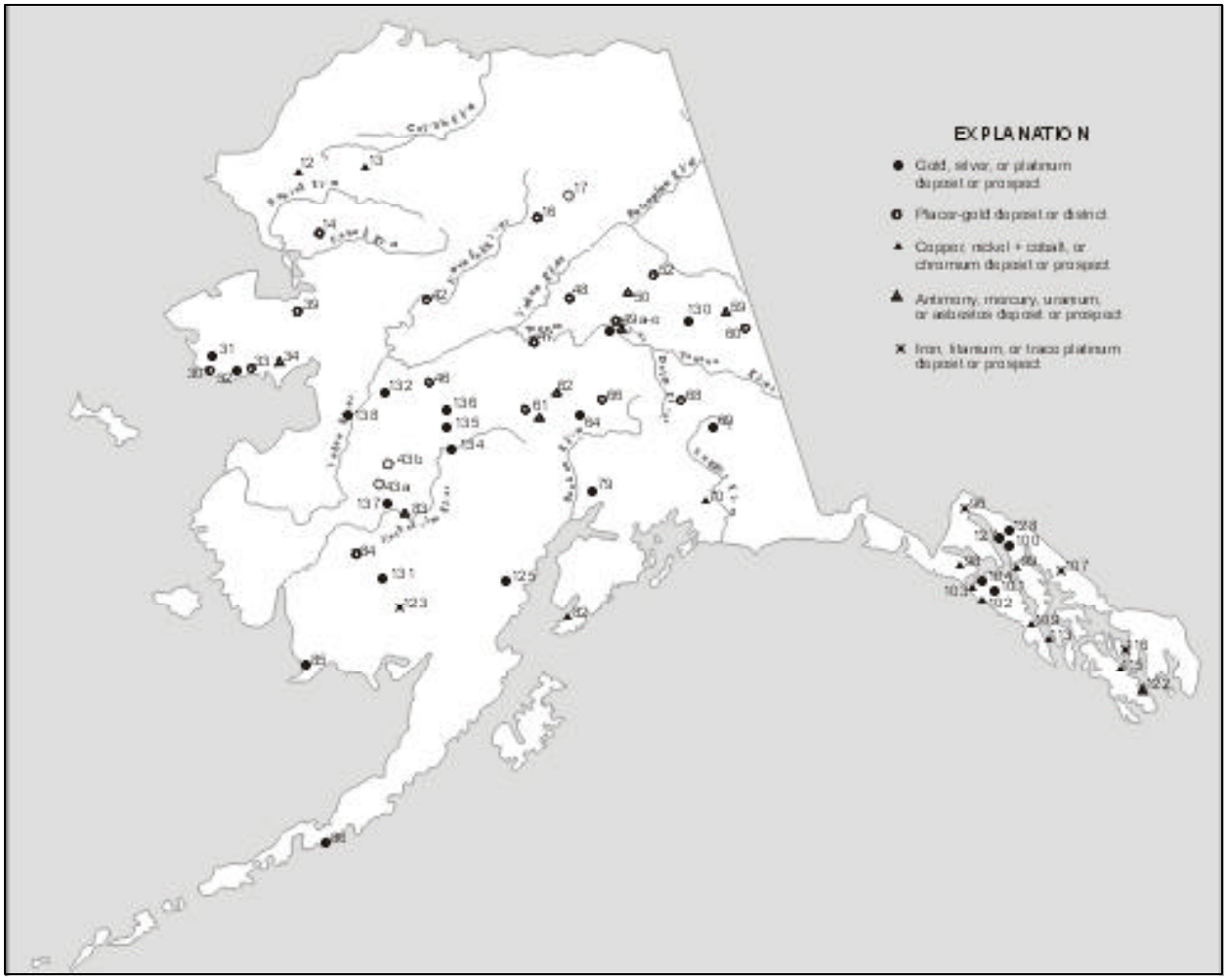


Figure D-3. *Significant gold, silver, platinum, and strategic mineral deposits in Alaska, 1999.*

metabasalt. Average grades are 1 to 4% Pb, 6 to 12% Zn, 0.5 to 7% Cu, 3 to 11 oz/ton Ag (fig. D-1).

11 **Smucker**—Middle Paleozoic volcanogenic massive sulfide deposit; 3,000 ft long and up to 190 ft wide; contains significant tonnage of Cu–Pb–Zn ore that grades 1.5% Pb, 5 to 10% Zn, 3 to 10 oz/ton Ag, with minor Au (fig. D-1).

12 **Avan Hills**—Disseminated chromite in layered ultramafic rocks; grab samples contain up to 4.3% Cr with 0.015 oz/ton PGM (fig. D-3).

13 **Misheguk Mountain**—Chromite occurrences similar to those in Avan Hills (fig. D-3).

14 **Klery Creek**—Lode and placer Au deposits worked intermittently from 1909 through 1930s. Total production through 1931, mostly from placer deposits, estimated at 31,320 oz Au (fig. D-3).

15 **Ernie Lake (Ann Creek)**—Stratabound massive sulfide occurrence in metarhyolite, metatuff, and marble. Gossan zones strongly anomalous in Cu–Pb–Zn and Ag (fig. D-1).

16 **Koyukuk–Nolan mining district**—Major placer Au district; from 1893 to 1999 produced an estimated 342,489 oz Au. Gold placers in Nolan Creek mined on surface and underground, both sources of large gold nuggets. Significant deep placer reserves remain (fig. D-3).

17 **Chandalar mining district**—Major Au-producing district; substantial production in excess of 65,860 oz Au through 1999 from lode and placer sources; lode Au found in crosscutting quartz veins that intrude schist and greenstone. Active development of placer deposits and lodes in progress. Inferred lode reserves estimated to be 45,000 tons with grade of 2 oz/ton Au (fig. D-3).

18 **Porcupine Lake**—Stratiform fluorite occurrences and argentiferous enargite, tetrahedrite associated with felsic volcanic rocks of late Paleozoic age. Reported grades of up to 30% fluorite (CaF_2) reported, with grab samples of 4.8% Cu (fig. D-2).

19 **Wind River**—Stratabound Pb–Zn massive sulfide prospects; reported grades of up to 5% Pb (fig. D-1).

20 **Esotuk Glacier**—Disseminated Mo–Sn–W–Pb–Zn mineralization in skarns associated with Devonian(?) schistose quartz monzonite. Grab samples contain up to 0.08% Sn and 0.15% W (fig. D-2).

21 **Bear Mountain**—Major stockwork Mo–W–Sn occurrence in intrusive breccia. Rock samples containing up to 0.8% Mo and 0.6% W occur within a 35-acre area where soil samples average more than 0.2% MoS_2, and an adjacent 25-acre area where rubble contains wolframite has soils averaging greater than 0.12% WO_3. Rubble crop in this area indicates a Tertiary porphyry system as the source of the Mo and W (fig. D-2).

21a **Galena Creek**—Steeply dipping veins contain up to 21% Cu, 3.5% Zn, and 1.3% Pb with 5.5 oz/ton Ag on the east side of the creek, and on the ridge west of the creek a large area of disseminated mineralization and veinlets contains predominantly Zn (fig. D-1).

22 **Cape Creek**—Major placer Sn producer. More than 500 tons Sn produced from 1935 to 1941; from 1979 to 1990, produced 1,040 tons Sn. Derived from Cape Mountain in contact zone of Cretaceous granite and limestone (fig. D-2).

23 **Buck Creek**—Major placer Sn producer. More than 1,100 tons Sn produced from 1902 to 1953 (fig. D-2).

24 **Lost River**—Major Sn, fluorite, W, and Be deposit associated with Cretaceous Sn granite system. More than 350 tons Sn produced from skarn and greisen lode sources. Measured reserves amount to 24.6 million tons that grade 0.15% Sn, 16.3% CaF_2, and 0.03% WO_3, based on 45,000 ft of diamond drilling (fig. D-2).

25 **Ear Mountain**—Placer Sn district and Sn–Cu–Au–Ag–Pb–Zn skarn mineralization of Cretaceous age. Area also anomalous in U (fig. D-2).

26 **Kougarok Mountain**—Sn deposit hosted in quartz–tourmaline–topaz greisen of Cretaceous age. Grades may average 0.5% Sn and 0.01% Ta and Nb, but a high-grade resource of 150,000 tons grading 1% + Sn has been identified, with incrementally higher tonnage at lower grades (fig. D-2).

27 **Hannum**—Stratiform, carbonate-hosted Pb–Zn–Ag massive sulfide deposit of mid-Paleozoic age in heavily oxidized zone that ranges from 30 to 150 ft thick. Mineralized zone reported to assay up to 10% Pb, 2.2% Zn, 0.04 oz/ton Au, and 1.76 oz/ton Ag (fig. D-1).

28 **Independence Creek**—Pb–Zn–Ag massive sulfide deposit; high-grade ore shipped in 1921 contained 30% Pb, 5% Zn, up to 150 oz/ton Ag. Mineralization restricted to shear zone in carbonates (fig. D-1).

29 **Sinuk River region**—Several Pb–Zn–Ag–Ba–F bearing massive sulfide deposits and layered Fe deposits in carbonate and metavolcanic rocks of Nome Group. Mineralized zones extend for over 8,000 ft along strike (fig. D-1).

30 **Nome mining district**—Major placer Au producer. Production from 1897–1999 in excess of 4,978,449 oz Au all from placers. Sporadic Sb and W production in past (fig. D-3).

31 **Rock Creek**—750,000 oz Au resource, with about 10.2 million tons grading 0.074 oz/ton Au in vein swarms and stringers in an area 1,500 ft long, 500 ft maximum width and 300 ft deep (fig. D-3).

32 **Big Hurrah**—Epigenetic vein deposit in black slate and metasedimentary rocks of the Soloman schist. Deposit contains some W mineralization and has produced over 27,000 oz Au from nearly 50,000 tons milled ore. Proven, inferred, and indicated reserves total 104,000 tons that grade 0.61 oz/ton Au, 0.55 oz/ton Ag, and credits of WO_3 (fig. D-3).

33 **Solomon and Council mining districts**—Major placer Au districts; produced over 1,046,513 oz through 1999. Three structurally controlled Au deposits in Bluff area—Daniels Creek, Saddle, and Koyana Creek—contain minimum inferred reserves of 6.5 million tons grading 0.1 oz/ton Au (fig. D-3).

34 **Eagle Creek**—U prospect in Cretaceous Kachauik alkalic intrusive rocks. Highly anomalous geochemical values and U concentrations of 1,000 ppm reported (fig. D-3).

35 **Omalik**—Vein-type Pb–Zn–Ag massive sulfide prospect in Paleozoic carbonate rocks; from 1881 to 1900, produced 400 tons of Pb–Zn ore that averaged about 10% Pb and 40 oz/ton Ag. Grades of oxidized Zn ore reported to be up to 34% Zn (fig. D-1).

36 **Windy Creek**—Disseminated Mo–Pb–Zn mineralization in quartz veins and skarns with reported values as high as 0.15% Mo (fig. D-2).

37 **Quartz Creek**—Significant Pb–Zn–Ag mineralization; reported grades of 15% combined Pb–Zn and 10 oz/ton Ag (fig. D-1).

38 **Placer River**—Significant Mo–F mineralization disseminated in intrusive rocks. Reported values of 0.2% Mo (fig. D-2).

39 **Fairhaven/Inmachuk district**—Placer deposits with 348,079 oz production from 1902–1999; significant reserves remaining in a large ancestral channel system. Large base metal sulfide concentrations and U values in concentrates (fig. D-3).

40 **Poovookpuk Mountain**—Porphyry Mo mineralization. Reported grades of up to 0.25% Mo (fig. D-2).

41 **Purcell Mountain**—Mo and Ag occurrences associated with Cretaceous alkalic igneous plutons, alaskite, and bostonite dikes (fig. D-2).

42 **Koyukuk–Hughes mining district**—Production of 245,188 oz Au from 1930 to 1999, mainly from Alaska Gold Co. dredge at Hogatza; dredge reactivated in 1981, but deactivated in 1984, and reactivated again in 1990. Nonfloat mechanized operation on Utopia Creek produced significant amount of placer Au from 1930 to 1962 (fig. D-3).

43 **Iditarod district**—Major placer Au district; produced 1,562,674 oz Au through 1999. Significant reserves of lode Au and lode W at Golden Horn deposit Chicken Mountain, and other known lodes in region associated with shear zones and monzonite intrusive rocks of Late Cretaceous age (fig. D-3).

44 **Innoko–Tolstoi mining district**—Major placer Au district with significant lode Au–Sb–Hg potential; lode sources for placers are Late Cretaceous volcanic-plutonic complexes and dike swarms that intrude Mesozoic flysch; mining district produced 723,290 oz Au through 1999, almost all from placer deposits (fig. D-3).

45 **Bonanza Creek**—Skarn-type W mineralization along intrusive contact; no published information available (fig. D-2).

46 **Ruby mining district**—Placer Au–Sn district; produced more than 477,171 oz Au from 1931 to 1999; mining district also contains Pb–Ag prospects with grades reportedly as high as 82 oz/ton Ag (fig. D-3).

47 **Hot Springs mining district**—Placer Au–Sn district; produced more than 576,082 oz Au and over 720,000 lb cassiterite through 1999. Includes Eureka and Tofty subdistricts (figs. D-2, D-3).

48 **Livengood–Tolovana mining district**—Placer Au district; produced more than 527,978 oz Au since discovery in 1914 to 1999. Substantial reserves remain mainly on Livengood Bench, a Pliocene ancestral channel (fig. D-3).

49 **Fairbanks mining district**—Nationally ranked Au-producing district; largest producer in Alaska. Produced about 8,145,550 oz Au from placer deposits (1902–1999). Major lode Au and lode Sb producer; produced more than 304,548 oz Au and over 2000 tons Sb from veins and shear zones through 1990. Production of W exceeded 4,000 short ton units since 1915, all derived from skarn near Cretaceous quartz monzonite (fig. D-3).

49a **Fort Knox**—Disseminated Au deposit within granodiorite/quartz monzonite pluton near Fairbanks. Proven and probable reserves as of December 31, 2000, open at depth, are 3,686,000 oz of Au in 138.4 million tons of rock at an average Au grade of 0.024 oz/ton. Measured and indicated resources are 34.45 million tons containing 963,000 ounces of gold. Fairbanks Gold Mining Inc. mined 1,461,677 oz of Au from 1996 to 2000. (fig. D-3).

49b **Ryan Lode**—Based on a 0.015 oz/ton cutoff, total reserves in the metasediment-hosted Ryan Lode and subparallel igneous-hosted Curlew Shear are 822,200 oz of Au in 14.6 million tons of rock. A geologic resource of about 2.4 million oz occurs within the total shear zone system (fig. D-3).

49c **Grant Mine**—A series of subparallel Au-bearing quartz veins in the schist and quartzite of Ester Dome based on exploration in 1990. Indicated reserves on one vein system, the O'Dea, are 212,000 tons of 0.36 oz/ton Au. Other similar vein systems have been identified within the property (fig. D-3).

49d **True North**—Au occurs in siderite-quartz veins in carbonaceous quartzite and schist within a terrane containing eclogitic rocks. The mineral inventory is 18.2 million tons grading 0.072 oz/ton Au for a contained 1,314,000 oz Au. Further exploration is expected to increase the reserve base (fig. D-3).

49e **Dolphin—**Recently recognized mineralized intermediate intrusion contains anomalous Au, As, Bi and Sb. Discovery hole in 1995 intercepted 330 ft of 0.049 oz/ton Au (fig. D-3).

49f **Gil Claims**—Gold occurs in two calc-silicate zones within Paleozoic schist units. Gold enrichment occurs along iron-stained shears and within quartz-calcite veinlets. Drilling has identified an in-place Au resource of 433,000 oz at an average grade of 0.04 oz/ton Au (fig. D-3).

50 **Mt. Prindle**—Significant U-rare-earth mineralization in Mesozoic alkaline igneous rocks. Rock geochemical values of up to 0.7% U; up to 15% rare-earth elements reported (fig. D-3).

51 **Twin Mountain**—Significant W mineralization associated with skarn development along contact zone of quartz monzonite stock of Cretaceous age (fig. D-2).

52 **Circle mining district**—Currently one of Alaska's largest producing placer Au districts; produced 1,049,157 oz Au since discovery in 1893 to 1999. Has significant potential for Sn, W, and Au mineralization from variety of lode sources (fig. D-3).

53 **Three Castle Mountain, Pleasant Creek, Casca VABM**—Stratabound Pb–Zn massive sulfide mineralization. Reported grades of up to 17% Zn and 2% Pb (fig. D-1).

54 **Bonnifield district massive sulfide deposits (Anderson Mountain, Dry Creek, Sheep Creek, Virginia Creek, BT, Liberty Belle)**—Significant volcanogenic Cu–Pb–Zn–Ag massive sulfide deposits of Devonian to Mississippian age in Bonnifield mining district. Potential for high-grade deposits reported. Includes Liberty Belle stratabound Au–B deposit and mineralization in Sheep Creek; latter contains Sn as well as base metals (fig. D-1).

55 **Delta massive sulfide belt**—Contains at least 30 known volcanogenic massive sulfide deposits and occurrences. Grades from 0.3 to 1.1% Cu, 1.7 to 5.7% Zn, 0.5 to 2.3% Pb, 0.7 to 2.0 oz/ton Ag, and 0.018 to 0.061 oz/ton Au; estimated potential reserve of 40 million tons for all deposits. Recent exploration has identified several gold prospects associated with silicified structures in the White Gold trend (fig. D-1).

56 **Mosquito, Peternie**—Porphyry Mo prospects of early Tertiary age; reported grades of up to 0.17% Mo (fig. D-2).

57 **Taurus**—Significant major porphyry Cu–Au prospect of Paleocene age. East Taurus Zone contains inferred reserves of 140 million tons grading about 0.30% Cu and 0.01 oz/ton Au, and 0.03% Mo (fig. D-2).

58 **Big Creek/Ladue**—Stratabound Pb–Zn–Ag massive sulfide prospects in metavolcanic rocks (fig. D-1).

59 **Slate Creek**—At least 55 million tons of 6.3%, high-quality chrysotile asbestos in serpentinized ultramafic rocks of Permian(?) age (fig. D-3).

60 **Fortymile mining district**—Major placer Au district. Produced over 542,396 oz placer and very minor lode Au since discovery in 1883 to 1999, the longest continuous production of Au (113 years) of any Alaskan mining district (fig. D-3).

61 **Kantishna mining district**—Major placer Au and lode Ag–Au–Pb–Zn–Sb–W district. Produced 99,307 oz placer and lode Au, about 307,000 oz lode Ag, and 2,500 tons Sb from shear zones and vein deposits hosted in metamorphic units of Yukon-Tanana terrane. Nearly 90 lode deposits have been identified; potential exists for significant Ag–Au–Pb–Zn resources. Metalliferous stratabound base metal deposits occur in schist and quartzite (fig. D-3).

62 **Stampede mine**—Major Sb deposit; produced more than 1,750 tons Sb from large shear zone in poly-metamorphic rocks of Yukon–Tanana terrane (fig. D-3).

63 **Coal Creek**—Greisen-hosted Sn–Cu–W deposit in "McKinley" age pluton (55 million years old). Reported reserves of 5 million tons of ore that grade 0.28% Sn and 0.3% Cu with credits of W, Ag, and Zn (fig. D-2).

64 **Golden Zone mine**—Major Au–Cu–Ag deposits in Late Cretaceous breccia pipe and skarn deposits. Produced more than 1,581 oz Au, 8,617 oz Ag, and 21 tons Cu. On the basis of recent (1994) drilling, the Pipe, Bunkhouse, and Copper King deposits contain 13.3 million tons grading 0.095 oz/ton Au (figs. D-1 and D-3).

65 **Nim Prospect**—Porphyry Cu–Ag–Au deposit of Late Cretaceous age. Reported grades of up to 5.0% Cu and 9 oz/ton Ag (fig. D-1).

66 **Valdez Creek district**—About 508,554 oz Au production through 1999. Cambior Alaska Inc., the largest placer mine in Alaska, operated in this district until September 1995 (fig. D-3).

67 **Caribou Dome** (**Denali)**—Ten identified stratabound Cu deposits in volcanic sedimentary rocks of Triassic age. Proven and probable ore is 700,000 tons grading 6% Cu with Ag credits, with indicated resources that may contain 2 million tons ore over strike length of 4,000 feet (fig. D-1).

67a **Zackly**—Disseminated Cu and Au in a garnet-pyroxene skarn and marble. Reserves are estimated at 1.4 million tons grading 2.6 percent Cu and 0.175 oz/ton Au (fig. D-1).

68 **Chistochina**—Porphyry Cu prospects of Tertiary age and placer Au district; produced more than 181,261 oz Au and small amount Pt from placer deposits (figs. D-2, D-3).

69 **Nabesna mine**—Classic high-grade Au skarn that envelopes quartz diorite of Jurassic(?) age; produced over 66,500 oz Au from about 88,000 tons of ore from 1930 to 1941 (fig. D-3).

70 **Spirit Mountain**—Massive and disseminated Cu–Ni mineralization in mafic-ultramafic complex (fig. D-3).

71 **Kennecott deposits**—Major stratiform Cu–Ag massive sulfide deposits localized near contact between Chitistone Limestone and Nikolai Greenstone of Triassic age; contained some of highest grade Cu lodes mined in North America. From 1911 to 1938, produced more than 600,000 tons Cu and 10 million oz Ag from 4.8 million tons ore. Some reserves remain (fig. D-1).

72 **Binocular and other prospects**—Kennecott-type Cu–Ag massive sulfide deposits (fig. D-1).

73 **Bond Creek–Orange Hill**—Two major porphyry Cu–Mo deposits of Late Cretaceous age; reported inferred reserves of 850 million tons ore that grade 0.3 to 0.5% Cu and 0.03% Mo (fig. D-2).

74 **Carl Creek**—Porphyry Cu prospect in altered intrusive complex; similar to locality 73 (fig. D-2).

75 **Baultoff**—Porphyry Cu prospect in altered intrusive rocks; inferred reserves of 145 million tons of 0.20% Cu; similar to locality 73 (fig. D-2).

76 **Horsfeld**—Porphyry Cu prospect; similar to locality 73 (fig. D-2).

77 **Midas mine**—Significant stratabound Cu (Ag–Au–Pb–Zn) massive sulfide deposit in volcanic sedimentary rocks of Tertiary Orca Group. Produced more than 1,650 tons Cu from 49,350 tons ore (fig. D-1).

78 **Ellamar**—Stratabound Cu–Zn–Au massive sulfide deposit in sediment of Eocene(?) Orca Group. Produced more than 8,000 tons Cu, 51,307 oz Au, and 191,615 oz Ag from about 301,835 tons ore (fig. D-1).

79 **Willow Creek, Independence, Lucky Shot, War Baby**—Major lode Au deposits (Ag–Cu–Pb–Zn–Mo) in veins that cut Mesozoic quartz diorite. Produced more than 606,400 oz Au from lode sources and about 55,600 oz Au from associated placer deposits (fig. D-3).

80 **Latouche, Beatson**—Major stratabound Cu–Zn–Ag massive sulfide deposits in Orca Group sedimentary rocks and mafic volcanic rocks. Produced more than 10,250 tons Cu from 6 million tons ore. Inferred reserves of 5 million tons ore that grade 1% Cu, 1.5% Pb+Zn (fig. D-1).

81 **Rua Cove**—Major stratabound Cu–Zn massive sulfide deposit in complex ore shoots enclosed in mafic volcanic rocks of Orca Group. Reported reserves of over 1.1 million tons ore that grade 1.25% Cu (fig. D-1).

82 **Red Mountain and Claim Point**—Significant Cr occurrence associated with layered ultramafic complexes of Tertiary age at Red Mountain near Seldovia. More than 39,951 tons of metallurgical-grade ore shipped through 1976; huge low-grade Cr resource may remain, of which 30 million tons grade 5.1% Cr_2O_3 (fig. D-3).

83 **Red Devil**—Major Hg–Sb deposit; high-grade epithermal Hg–Sb deposit hosted in shear zones in Kuskokwim

Group sedimentary rocks. More than 35,000 flasks Hg produced from 75,000 tons ore (fig. D-3).

84 **Aniak district**—Significant placer Au district. Aniak mining district produced 578,708 oz Au from placer deposits, mainly from the Nyac and Donlin Creek areas (fig. D-3).

85 **Goodnews Bay**—Major placer Pt district; estimated to have produced over 555,000 oz refined PGE metals from 1934 to 1976; one of the largest known PGE metal resources in United States. Possible resources of 60 million yd^3 of deep, PGE-bearing gravels remain. Lode source believed to be Alaskan-type zoned ultramafic complex of Jurasssic or Cretaceous age. Possible significant offshore placer potential (fig. D-3).

86 **Apollo–Sitka mines**—Major lode Au deposits; produced more than 107,600 oz Au from ore that averaged about 0.22 oz/ton Au. Inferred reserves are 748,000 tons grading 0.76 oz/ton Au, 2.16 oz/ton Ag, with base metal credits (fig. D-3).

87 **Pyramid**—Late Tertiary porphyry Cu–Mo deposit; inferred reserves of 125 million tons ore that grade 0.4% Cu and 0.03% Mo reported (fig. D-2).

88 **Ivanof**—Late Tertiary porphyry Cu prospect; grades of up to 0.72% Cu reported. Potential for large tonnages (fig. D-2).

89 **Weasel Mountain, Bee Creek**—Porphyry Cu–Mo prospect of late Tertiary to Quaternary age; grades of up to 0.48% Cu and 0.035% Mo reported. Potential for moderate tonnages of low-grade mineralization (fig. D-2).

90 **Mike deposit**—Porphyry Mo prospect of late Tertiary age; grades of up to 0.21% Mo reported. Potential for large tonnages of low-grade Mo mineralization (fig. D-2).

91 **Rex deposit**—Porphyry Cu prospect similar to locality 90; grades of up to 0.3% Cu reported. Potential for moderate reserves of low-grade mineralization (fig. D-2).

92 **Kasna Creek**—Major stratiform Cu–Pb–Zn and skarn-sulfide deposits of Mesozoic age in mafic, volcanic, and sedimentary rocks; reported reserves of over 10 million tons ore that grade more than 1% Cu (fig. D-1).

93 **Sleitat Mountain**—High-grade east-west-trending, Sn–W–Ag topaz–quartz greisen system hosted in 59-million-year-old granite and in hornfels. Zone up to 3,000 ft long and 500 ft wide. One drill-hole showed 85 ft of 1.8% Sn, and 0.4% W. Inferred resources are 64,000 to 106,000 tons Sn in 29 million tons ore (fig. D-2).

94 **Jimmy Lake**—Complex Cu–Ag–Sn mineralization of late Tertiary(?) age; reported grades of up to 105 oz/ton Ag and 3% Cu (fig. D-1).

95 **Haines Barite/Palmer**—Major stratiform Ba–Pb–Zn–Cu–Ag deposit in pillow basalt-dominated section of Paleozoic or Triassic age; consists of 48- to 60-ft-thick zone of 60% barite with upper zone (2 to 8 ft thick) of massive sulfides that contain 2% Pb, 3% Zn, 1% Cu, up to 4 oz/ton Ag, and 0.12 oz/ton Au. Estimated to contain 750,000 tons of 65% barite with Zn and Ag credits (fig. D-1).

96 **Klukwan**—Major Fe–Ti deposits in zoned ultramafic complex of Mesozoic age; reported to contain 3 billion tons of material that contains 16.8% Fe and 1.6 to 3.0% Ti (fig. D-3).

97 **Nunatak**—Porphyry Mo deposit; reported reserves of 2.24 million tons ore grading 0.067% Mo, 0.16% Cu, and 129.5 million tons of 0.026% Mo, 0.18% Cu (fig. D-2).

98 **Brady Glacier**—Major Ni–Cu deposit in layered gabbro–pyroxenite complex of Tertiary age. Proven reserves of 100 million tons ore that grade 0.5% Ni, 0.3% Cu reported and about 0.03% Co; also contains PGE concentrations (fig. D-3).

99 **Mertie Lode and Funter Bay mining district**—Contains substantial reserves of lode Au mineralization. Past production totaled about 15,000 oz Au. Deposits also contain significant Ni–Cu and Pb–Zn–Ag mineralization. Funter Bay deposit contains reported reserves of 560,000 tons that grade 0.34% Ni, 0.35% Cu, and 0.15% Co in gabbro-pipe system (fig. D-3).

100 **Alaska–Juneau**—Major lode Au deposit that consists of 100- to 300-ft-wide zone that contains en echelon, Au–bearing quartz veins in metamorphic rocks; produced more than 3.52 million oz Au from 88.5 million tons ore from 1893 to 1944. Reserves (all categories) of 105.7 million tons of 0.05 oz/ton Au remain (fig. D-3).

101 **Chichagof and Hirst Chichagof**—Major lode Au deposits in quartz veins that cut Mesozoic graywacke; produced more than 770,000 oz Au, most of which was produced at Chichagof Mine. Inferred leased reserves estimated to be 100,000 oz Au (fig. D-3).

102 **Mirror Harbor**—Ni–Cu mineralization in layered gabbro complex of Mesozoic age; reported proven reserves of 8,000 tons of 1.57% Ni and 0.88% Cu and reported inferred reserves of several million tons ore that grade 0.2% Ni and 0.1% Cu (fig. D-3).

103 **Bohemia Basin**—Major Ni–Cu–Co mineralization in layered mafic complex similar to locality 102; reported reserves of 22 million tons ore that grade 0.33 to 0.51% Ni, 0.21 to 0.27% Cu, and 0.02% Co, all of which are recoverable with standard flotation technology (fig. D-3).

104 **Apex–El Nido**—Significant lode Au–W deposits that occur as crosscutting veins in graywacke; produced more than 50,000 oz Au (fig. D-3).

105 **Greens Creek**—Major sediment-hosted Pb–Zn–Cu–Ag–Au volcanogenic massive sulfide deposit of Devonian or Triassic age; most recent reserve estimate of the original orebody is 11.0 million tons grading 0.12 oz/ton Au, 13.3 oz/ton Ag, 12.8% Zn, and 4.0% Pb. Additional reserves in the southwest orebody are 2.0 million tons grading 13.5% Zn, 5.5% Pb, 0.27 oz/ton Au, and 33 oz/ton Ag. Total combined reserves and resources of the mine are estimated to be 18 million tons (fig. D-1).

106 **Sumdum**—Volcanogenic Cu–Pb–Zn massive sulfide deposit in Mesozoic metamorphic complex with potential strike length of over 10,000 ft. Inferred reserves of 26.7 million tons ore that grade 0.57% Cu, 0.37% Zn, and 0.3 oz/ton Ag reported (fig. D-1).

107 **Snettisham**—Fe–Ti deposit in mafic zoned intrusive complex; reported grades of about 18.9% Fe and 2.6% Ti (fig. D-3).

108 **Tracy Arm**—Stratabound Cu–Zn–Pb massive sulfide prospect in Mesozoic schist; over 1,100 ft long and up to 12 ft thick. Reported grades of 1.5% Cu, 3.9% Zn, 0.76 oz/ton Ag, and 0.013 oz/ton Au (fig. D-1).

109 **Red Bluff Bay**—Significant chrome mineralization in Mesozoic ultramafic complex (probably ophiolite); reported reserves of 570 tons of material that grade 40% Cr and 29,000 tons that grade 18 to 35% Cr (fig. D-3).

110 **Cornwallis Peninsula**—Volcanogenic Cu–Pb–Zn–Ag–Ba massive sulfide deposit of Triassic(?) age; reported grades of up to 20% Pb–Zn and 23 oz/ton Ag (fig. D-1).

111 **Castle Island**—Stratiform barite deposit of Triassic age hosted in carbonate and pillow basalt; about 856,000 tons of raw and refined barite produced from 1963 to 1980; also contains Zn, Pb, and Cu sulfides. Reported to be mined out (fig. D-1).

112 **Groundhog Basin**—Area contains several massive sulfide prospects in Mesozoic schist and gneiss whose origins are now thought to be plutonic associated. Reported grades of up to 8% Pb, 29 oz/ton Ag, and 0.5 oz/ton Au. Sn has also been recently identified. Area also contains potential for porphyry Mo deposits (fig. D-1).

113 **Snipe Bay**—Ni–Cu deposit in zoned mafic-ultramafic complex; inferred reserves of 430,000 tons of 0.3% Ni, 0.3% Cu, and 0.13 oz/ton Ag reported (fig. D-3).

114 **Kasaan Peninsula**—Major skarn-type Cu–Fe-Au massive sulfide deposit of Jurassic age; area has produced over 14,000 tons Cu, and 55,000 oz Ag. Reported reserves of 4 million tons ore that grade 50% Fe and less than 2% Cu (fig. D-1).

115 **Salt Chuck**—Cu–PGM–Ag–Au deposit in contact zone between pyroxenite and gabbro within Alaskan-type zoned mafic-ultramafic pluton. From 1900 to 1941, 2,500 tons Cu, over 20,000 oz PGM, and Au and Ag credits were produced from 325,000 tons ore (fig. D-3).

116 **Union Bay**—Significant Fe–Ti mineralization in ultramafic complex; area also contains Pt and V concentrations (fig. D-3).

117 **Hyder mining district**—Area produced more than 25,000 tons high-grade W–Cu–Pb–Zn–Ag ore from 1925 to 1951 from crosscutting ore shoots in Texas Creek granodiorite of Tertiary age. Area also contains potential for porphyry Mo–W mineralization and massive sulfide–skarn Pb–Ag–Au–W deposits (figs. D-1, D-2).

118 **Jumbo**—Cu–Fe–Mo–Ag skarn deposit; produced more than 5,000 tons Cu, 280,000 oz Ag, and 7,000 oz Au from 125,000 tons ore. Zoned magnetite–Cu skarns are associated with epizonal granodiorite pluton of Cretaceous age. Reported reserves of 650,000 tons ore that grade 45.2% Fe, 0.75% Cu, 0.01 oz/ton Au, and 0.08 oz/ton Ag (fig. D–1).

119 **Copper City**—Stratiform Cu–Zn–Ag–Au massive sulfide deposit hosted in late Precambrian or earliest Paleozoic Wales Group. Reported grades of up to 12.7% Cu, 2.7% Zn, 2.5 oz/ton Ag, and 0.2 oz/ton Au (fig. D–1).

120 **Quartz Hill**—A porphyry Mo deposit hosted in a 25-million-year-old composite felsic pluton. Probable reserves are 232 million tons with a grade of 0.22% MoS_2, and possible reserves are 1.2 billion tons with 0.12% MoS_2 (fig. D-2).

121 **Niblack**—Volcanogenic Cu–Pb–Au–Ag massive sulfide deposit hosted in Precambrian(?) Wales Group or Ordovician to Silurian Descon Formation; produced more than 700 tons Cu, 11,000 oz Au, and 15,000 oz Ag. Current resource is 2.78 million tons at 3.3% Zn, 1.7% Cu, 1.14 oz/ton Ag and 0.087 oz/ton Au. (fig. D-1).

122 **Bokan Mountain**—Numerous U–Th prospects associated with Jurassic peralkaline intrusive complex; from 1955 to 1971, produced more than 120,000 tons ore that graded about 1% U_3O_8. Contains inferred reserves of about 40 million tons of 0.126% Nb and up to 1% REE metals (fig. D-3).

123 **Kemuk Mountain**—Magmatic Fe–Ti deposit hosted in Cretaceous(?) pyroxenite. Inferred reserves of 2.4 billion tons that average 15 to 17% Fe, 2 to 3% TiO_2, and 0.16% P_2O_5 (fig. D-3).

124 **McLeod**—Porphyry Mo deposit that contains quartz-molybdenite fissure veins in quartz-feldspar porphyry. Chip samples contain up to 0.09% Mo (fig. D-2).

125 **Johnson River**—Epigenetic(?) quartz-sulfide stockwork or massive sulfide deposit hosted in volcaniclastic, pyroclastic, and volcanic rocks of Jurassic Talkeetna Formation. Deposit has drilled-out reserves at a $45/ton cutoff with no cut of high Au assays, 1,099,580 tons grading 0.32 oz/ton Au, 0.24 oz/ton Ag, 0.76% Cu, 1.17% Pb, and 8.37% Zn (fig. D-3).

126 **Nimiuktuk River**—Small hill of massive, high-grade barite estimated to contain at least 1.5 million tons barite. Widespread stream-sediment Ba anomalies in area indicate further barite potential (fig. D-1).

127 **Kensington**—Stockwork quartz veins in sheared and chloritized quartz diorite produced 10,900 tons grading 0.18 oz/ton Au prior to 1930. Recent reserve estimates indicate at least 11.5 million tons grading 0.143 oz/ton Au. Subparallel Horrible vein system contains 3.93 million tons grading 0.11 oz/ton Au (fig. D-3).

128 **Jualin**—Five quartz-fissure veins in Cretaceous quartz diorite, more than 15,000 ft of underground workings;

produced 48,387 oz Au, mainly prior to 1930. Reserves estimated at 1.07 million tons of 0.349 oz/ton Au (fig. D-3).

129 **Pebble Copper**—Cu–Au porphyry with identified resource of 1 billion tons grading 0.30% Cu and 0.010 oz/ton Au with Mo in the 0.03 to 0.04% range (fig. D-1).

130 **Pogo**—Au hosted in a series (3 discovered to date) of sub-parallel and tabular, gently dipping, quartz vein zones hosted by Paleozoic gneisses intruded by Cretaceous felsic plutonic rocks. Au in the 3 ft to 60 ft thick quartz bodies has a strong correlation with Bi. A 1999 conservative kriged geological resource for the Liese L1 and L2 zones is 10.7 million tons at an average grade of 0.524 oz/ton, for a total of 5.6 million oz at a 0.1 oz/ton cut-off grade. Other high-grade Au targets have been identified along an 8-mi-long trend southeast of the Liese zones (fig. D-3).

131 **Shotgun Hills**—Quartz stockwork and breccia Au–Cu–As mineralization in a Late Cretaceous rhyolite (granite porphyry) stock. A preliminary, inferred Au resource of 980,000 oz (36.11 million tons at an average grade of 0.027 oz/ton Au) at a 0.016 oz/ton Au cut-off grade, with initial metallurgical tests indicating >90% Au recovery by cyanide leaching (fig. D-3).

132 **Illinois Creek**—Au–Ag–Cu–Pb–Zn–Bi–As-bearing, Fe–Mn oxide (gossan) shear zone crosscutting dolomitic quartzite localized near Cretaceous granitic pluton. Shear zone averages 148 ft wide, has a drill-defined east-west strike length of 11,600 ft, and is open along strike and depth. Produced approximately 56,600 oz Au and 222,000 oz Ag from 1997 to 1999. Proven and probable reserves as of December 31, 1997, calculated using a $330 Au price, totalled 144,200 oz of Au represented by 1.9 million tons of ore at a grade of 0.076 oz of Au and 1.6 oz of Ag/ton (figs. D-1, D-3).

133 **Calder Mine**—Seven recrystallized carbonate units exposed at the apex of a large regional antiform. Drilling has identified 13 million tons of chemically homogenous, high-brightness, high-whiteness marble with a purity of 98 to 99% calcium carbonate. Potential resource of 80 million tons of high-value calcium carbonate (fig. D-2).

134 **Vinasale Mountain**—Intrusion-hosted Au deposit. Au mineralization is associated with arsenopyrite and pyrite in quartz-dolomite hydrothermal breccias, magmatic breccias, and zones of phyllic and silicic alteration hosted within a 69 Ma quartz monzonite stock. Both disseminated and veinlet mineralization exist. An inferred resource of 14.35 million tons grading 0.067 oz/ton Au, with an 0.03 oz/ton cut-off grade has been identified by drilling in the Central zone (fig. D-3).

135 **Nixon Fork**—Au–Cu skarn deposits; Historic Nixon Fork mine produced 59,500 oz Au from Late Cretaceous skarns associated with quartz monzonite-Devonian limestone contact zones. Underground mining resumed in October 1995, with 133,900 oz of Au, 1,800 tons of Cu, and significant Ag produced through mine closure in 1999 (fig. D-3).

136 **Von Frank Mountain**—Au and very weak Cu mineralization are associated with chalcopyrite, pyrite, and rare molybdenite within a zone of quartz stockwork veining hosted in a 69 Ma quartz-diorite stock. The stock is a cupola of the larger Von Frank Pluton. Drill intercepts include thicknesses up to 429 ft with an average grade of 0.013 oz/ton Au. Higher grade intercepts include 0.035 oz/ton Au up to 135 ft (fig. D-3).

137 **Donlin Creek**—Au mineralization associated with disseminated pyrite and arsenopyrite, sulfide veinlets, and quartz-carbonate-sulfide veinlets in sericite-altered Late Cretaceous to early Tertiary rhyodacitic porphyry dikes and sills. Au mineralization is structurally controlled and refractory. Measured and indicated resource on January 2001 estimated at 6.9 million oz of Au grading 0.09 oz/ton Au and an inferred resource of 6.0 million oz Au grading 0.08 oz/ton Au at a 0.04 oz/ton Au cut-off grade. Using a higher cut-off grade of 0.1 oz/ton Au, the measured and indicated resource is 3.1 million ounces of gold grading 0.151 oz/ton Au with an additional inferred resource of 2.4 million ounces gold grading 0.145 oz/ton Au (fig. D-3).

138 **Kaiyah**—Au–Ag epithermal prospect in silicified Koyukuk sedimentary rocks adjacent to Poison Creek caldera. Polymetallic sulfides in quartz veins, with some veins over 100 feet thick, and silicification are associated with pervasive advanced argillic, and sericite alteration (fig. D-3).

APPENDIX E

State and federal agencies and private interest groups involved in mineral development activities, 2000

(The *Alaska Miners Association Directory* lists technical and professional consultants and companies available for work in Alaska. The report is published annually and is free to AMA members. The cost for non members is $15 plus shipping and handling.)

STATE OF ALASKA AGENCIES

DEPARTMENT OF COMMUNITY AND ECONOMIC DEVELOPMENT
State Office Building, 9th Fl.
P.O. Box 110800 (mailing)
Juneau, AK 99811-0800
(907) 465-2500 (907) 465-3767 (fax)

Function: Promotes economic development in Alaska.

Division of Community and Business Development
550 W. 7th Ave., Ste. 1770
Anchorage, AK 99501
(907) 269-8110 (907) 269-8125 (fax)

State Office Building, 9th Fl.
333 Willoughby Ave.
P.O. Box 110804 (mailing)
Juneau, AK 99811-0804
(907) 465-2017
(907) 465-3767 (fax)
http://www.dced.state.ak.us/cbd/
email: frankie_pillifant@dced.state.ak.us

Unit 7, 3677 College Rd.
Fairbanks, AK 99709
(907) 451-3050
(907) 451-3053 (fax)
email: swainbnk@ptialaska.net

Function: Primary state government advocacy agency for economic growth. Researches and publishes economic data on Alaska's mining industry. Attracts capital investment by advertising Alaska's resource potential. Provides research staff aid for the Alaska Minerals Commission. The Division also encourages the development of new markets for Alaska resources, increases the visibility of Alaska and its products in the international marketplace, and makes referrals and provides technical assistance to those interested in developing export markets for Alaska-produced or value-added goods and services.

Alaska Industrial Development & Export Authority (AIDEA)
813 W. Northern Lights Blvd.
Anchorage, AK 99503
(907) 269-3000 (907) 269-3044 (fax)
http://www.aidea.org

Function: AIDEA provides capital to finance economic growth throughout Alaska—from multi-million-dollar mining projects to small, family-owned businesses; from urban centers to small towns and rural villages. Regardless of project size, location, or business type, all AIDEA-financed projects must enhance the state's economy and provide or maintain jobs for Alaskans. AIDEA's financing assistance programs—the Credit Program and the Development Finance Program—have played an important role in Alaska's mineral development. The Credit Program includes the Loan Participation, Business and Export Assistance loan guarantee, and the Tax-Exempt Revenue Bond programs. AIDEA's Development Finance Program allows AIDEA to develop, own, and operate facilities within Alaska such as roads, ports, and utilities which are essential to the economic well-being of an area; are financially feasible; and are supported by the community in which they are located.

Alaska Science & Technology Foundation
4500 Diplomacy Dr., Ste. 515
Anchorage, AK 99508
(907) 272-4333 (907) 274-6228 (fax)
email: bchaney@astf.org
http://www.astf.org

Function: The Foundation was created to make public funds available for long-term investment in economic development and technological innovation within the state and to improve the health status of its residents. Through the awarding of grants for basic and applied research and development, the Foundation will enhance the state's economy and help build its science and engineering capabilities.

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
410 Willoughby Ave., Ste. 303
Juneau, AK 99801-1795
(907) 465-5010 (907) 465-5070(fax)
(907) 465-5040 TTY
(907) 465-5065 Commissioner's Office
(907) 465-5060 Public Information

Function: Issues permits for activities (including mining) that affect air or water quality or involve land disposal of wastes. Sets air- and water-quality standards. Inspects, monitors, and enforces environmental quality statutes, regulations, and permits. Reviews all federal permits.

Alaska Department of Environmental Conservation
Anchorage Office
555 Cordova St.
Anchorage, AK 99501-2617
(907) 269-7500 (907) 269-7600 (fax)
(907) 269-7511 TYY
Permits/Compliance Assistance
1-800-510-2332 (inside Alaska only)
1-800-269-7586 (outside Alaska)
email: compass@envircon.state.ak.us

Alaska Department of Environmental Conservation
Fairbanks Office
610 University Ave.
Fairbanks, AK 99709-3643
(907) 451-2360 (907) 451-2188 (fax)
(907) 451-2184 TTY

DEPARTMENT OF FISH AND GAME
1255 W. 8th St.
P.O. Box 25526 (mailing)
Juneau, AK 99802-5526
(907) 465-4100 (907) 465-4759
http://www.state.ak.us/local/akpages/FISH.GAME/habitat/hab_home.htm

Habitat and Restoration Division
(907) 465-4105

Function: Habitat and Restoration Division protects fish and fish habitat through the implementation of the Fishway Act, the Anadromous Fish Act, and other authorities. Manages refuges, sanctuaries, and critical habitats. Requires prior written

APPENDIX F
Alaska Mining Websites

Mining Companies

Abacus Mining & Exploration Co.	http://www.abacusminerals.com/
Almaden Resources Corp.	http://www.almadenresources.com/
Anglo Gold Ltd.	http://www.anglogold.com
Alaska Resource Data Files	http://ardf.wr.usgs.gov
Avalon Development Corp.	http://www.alaska.net/~avalon/
Barrick Gold Co.	http://www.barrick.com/
Boliden Limited	http://www.boliden.ca/
Cambior Inc.	http://www.cambior.com
Camflo Resources Ltd.	http://www.camflo.com/s/default.asp
CanAlaska Ventures, Ltd.	http://www.canalaska.com/
Coeur d'Alene Mines Corp. (Coeur Alaska Inc.)	http://www.coeur.com/
Cominco Ltd. (Cominco Alaska Inc.)	http://www.teckcominco.com/
Consolidated Pacific Bay Minerals Ltd.	http://www.pacific-bay.com/
Copper Ridge Explorations Inc.	http://www.copper-ridge.com
Cusac Gold Mines Ltd.	http://www.cusac.com
EMEX Corp.	http://www.emexcorp.com/
Engineer Mining Corp.	http://www.emcorp.yk.ca/
Grayd Resource Corp.	http://www.grayd.com/
Great Quest Metals Ltd.	http://www.greatquest.com
Hecla Mining Co.	http://www.hecla-mining.com/
Homestake Mining Co.	http://www.homestake.com
Hyder Gold Inc.	http://www.bmts.bc.ca/hgi/
Inco Ltd.	http://www.incoltd.com/
International Bravo Resource Corp.	http://www.internationalbravo.com
International Freegold Mineral Development Inc.	http://www.augoldgroup.com/itf.html
Kennecott Exploration Co.	http://www.kennecottexploration.com/
Kennecott Minerals Co.	http://www.kennecottminerals.com/
Kinross Gold Corp.	http://www.kinross.com/
Latitude Mineral Corp.	http://www.latitudeminerals.com
Newmont Mining Corp.	http://www.newmont.com/
NovaGold Resources Inc.	http://www.novagold.net
Pacific Rim Mining Co.	http://www.pacrim-mining.com/
Placer Dome Inc.	http://www.placerdome.com/
Red Diamond Mining Co., Inc.	http://www.reddiamondmining.com
Rimfire Minerals Corp.	http://www.rimfire.bc.ca/
Rubicon Minerals Corp.	http://www.rubiconminerals.com/home.htm
Quaterra Resources Inc.	http://www.quaterraresources.com/
Santoy Resources	http://www.bmts.bc.ca/san/
Shear Minerals Ltd.	http://www.shearminerals.com
Silverado Gold Mines Ltd.	http://www.silverado.com/
Teck Corp.	http://www.teckcominco.com
Teryl Resources Corp.	http://www.terylresources.com
Tri-Valley Corp.	http://www.tri-valleycorp.com/
Troymin Resources Ltd.	http://www.troymin.com/
Usibelli Coal Mine Inc.	http://www.usibelli.com/
Ventures Resource Corp.	http://www.venturesresource.com/
Western Keltic Mines Inc.	http://www.keltic.com/

Alaska Native Corporations

Ahtna Inc.	http://www.ahtna-inc.com/
Aleut Corp.	http://www.aleutcorp.com/
Arctic Slope Regional Corp.	http://www.asrc.com/
Bering Straits Native Corp.	http://www.beringstraits.com/
Bristol Bay Native Corp.	http://touchngo.com/BBNC/
Calista Corp.	http://www.calistacorp.com/
Chugach Alaska Corp.	http://www.chugach-ak.com
Cook Inlet Region Inc.	http://www.ciri.com/
Doyon Ltd.	http://www.doyon.com/
Koniag Inc.	http://www.koniag.com/
NANA Regional Corp.	http://www.nana.com/
Sealaska Corp.	http://www.sealaska.com/

APPENDIX G

U.S. Customary Units/Metric Units Conversion Chart

To convert from:	To:	Multiply by:
Weight/Mass/Ore Content		
ounces (avoirdupois)	grams	28.350
ounces (troy)	grams	31.1035
pounds	kilograms	0.4536
short tons	metric tons	0.9072
grams	ounces (avoirdupois)	0.03527
	ounces (troy)	0.03215
kilograms	pounds	2.2046
metric tons	short tons	1.1023
parts per million (ppm)	parts per billion (ppb)	1,000
parts per million (ppm)	ounces per ton	0.0292
parts per million (ppm)	grams/metric tons (tonnes)	1.00
Length		
miles	kilometers	1.6093
yards	meters	0.9144
feet	meters	0.3048
	centimeters	30.48
	millimeters	304.80
inches	centimeters	2.54
	millimeters	25.4
kilometers	miles	0.6214
meters	yards	1.0936
	feet	3.2808
millimeters	feet	0.00328
	inches	0.03937
centimeters	inches	0.3937
Area		
square miles	square kilometers	2.590
acres	square meters	4,046.873
	hectares	0.4047
square yards	square meters	0.8361
square feet	square meters	0.0929
square inches	square centimeters	6.4516
	square millimeters	645.16
square kilometers	square miles	0.3861
square meters	acres	0.000247
	square feet	10.764
	square yards	1.196
hectares	acres	2.471
	square meters	10,000.00
square centimeters	square inches	0.155
square millimeters	square inches	0.00155
Volume		
cubic yards	cubic meters	0.7646
cubic feet	cubic meters	0.02832
cubic inches	cubic centimeter	16.3871
cubic meters	cubic yards	1.3079
	cubic feet	35.3145
cubic centimeters	cubic inches	0.06102
gallons (U.S.)	liters	3.7854
liters	gallons (U.S.)	0.2642
milliliters	ounces (fluid)	0.03381
ounces (fluid)	milliliters	29.5735

Temperature conversions:
From degrees Fahrenheit to degrees Celsius, subtract 32 and multiply by 5/9.
From degrees Celsius to degrees Fahrenheit, multiply by 9/5 and add 32.

SOURCE: *Minerals Today*, February 1993, U.S. Bureau of Mines.

APPENDIX H
Primary metals production in Alaska, 1880-2000

Year	Gold		Silver		Mercury		Antimony		Tin		Lead		Zinc		Platinum		Copper		Chromium	
	(oz)	(m$)	(oz)	(t$)	(flask[b])	(t$)	(lb)	(t$)	(lb)	(t$)	(tons)	(t$)	(tons)	(t$)	(oz)	(t$)	(lb)	(m$)	(tons)	(t$)
1880-1899	1.153.889	23.85	496.101	329.0	- -	- -	- -	- -	- -	- -	250	17.0	- -	- -	- -	- -	- -	- -	- -	- -
1900	395,030	8.17	73,300	45.5	- -	- -	- -	- -	- -	- -	40	3.4	- -	- -	- -	- -	- -	- -	- -	- -
1901	335,369	6.93	47,900	28.6	- -	- -	- -	- -	- -	- -	40	3.4	- -	- -	- -	- -	250,000	0.04	- -	- -
1902	400,709	8.28	92,000	48.5	- -	- -	- -	- -	30,000	8.0	30	2.5	- -	- -	- -	- -	360,000	0.04	- -	- -
1903	420,069	8.68	143,600	77.8	- -	- -	- -	- -	50,000	14.0	30	2.5	- -	- -	- -	- -	1,200,000	0.16	- -	- -
1904	443,115	9.16	198,700	114.9	- -	- -	- -	- -	28,000	8.0	30	2.5	- -	- -	- -	- -	2,043,586	0.28	- -	- -
1905	756,101	15.63	132,174	80.2	- -	- -	- -	- -	12,000	4.0	30	2.6	- -	- -	- -	- -	4,805,236	0.75	- -	- -
1906	1,066,030	22.04	203,500	136.4	- -	- -	- -	- -	68,000	38.6	30	3.4	- -	- -	- -	- -	5,871,811	1.13	- -	- -
1907	936,043	19.35	149,784	98.8	- -	- -	- -	- -	44,000	16.8	30	3.2	- -	- -	- -	- -	6,308,786	1.26	- -	- -
1908	933,290	19.29	135,672	71.9	- -	- -	- -	- -	50,000	15.2	40	3.4	- -	- -	- -	- -	4,585,362	0.61	- -	- -
1909	987.417	20.41	147.950	76.9	- -	- -	- -	- -	22.000	7.6	69	5.9	- -	- -	- -	- -	4.124.705	0.54	- -	- -
1910	780.131	16.13	157.850	85.2	- -	- -	- -	- -	20.000	8.3	75	6.6	- -	- -	- -	- -	4.241.689	0.54	- -	- -
1911	815.276	16.85	460.231	243.9	- -	- -	- -	- -	122.000	52.8	51	4.5	- -	- -	- -	- -	27.267.778	3.40	- -	- -
1912	829.436	17.14	515.186	316.8	- -	- -	- -	- -	260.000	119.6	45	4.1	- -	- -	- -	- -	29.230.491	4.82	- -	- -
1913	755.947	15.63	362.563	218.9	- -	- -	- -	- -	100.000[c]	44.1[c]	6	0.6	- -	- -	- -	- -	21.659.958	3.35	- -	- -
1914	762.596	15.76	394.805	218.3	- -	- -	- -	- -	208.000	66.6	28	1.3	- -	- -	- -	- -	21.450.628	2.85	- -	- -
1915	807.966	16.70	1.071.782	543.3	- -	- -	520.000	W	204.000	78.8	437	41.1	- -	- -	- -	- -	86.509.312	15.14	- -	- -
1916	834.068	17.24	1.379.171	907.4	- -	- -	1.200.000	W	278.000	121.0	820	113.2	- -	- -	8	0.7	119.654.839	29.50	- -	- -
1917	709.049	14.66	1.239.150	1.020.6	- -	- -	500.000	W	200.000	123.3	852	146.6	- -	- -	53	5.5	88.793.400	24.40	1.100	W
1918	458.641	9.48	847.789	847.8	- -	- -	540.000	W	136.000	118.0	564	80.1	- -	- -	284	36.6	69.224.951	17.10	1.100	W
1919	455,984	9.42	629,708	705.3	- -	- -	- -	- -	112,000	73.4	687	72.1	- -	- -	569	73.7	47,220,771	8.80	- -	- -
1920	404,683	8.37	953,546	1,039.7	- -	- -	- -	- -	32,000	16.1	875	140.0	- -	- -	1,478	160.1	70,435,363	13.00	- -	- -
1921	390,558	8.07	761,085	761.1	45	1.5	- -	- -	8,000	2.4	759	68.3	- -	- -	40	2.7	57,011,597	7.40	- -	- -
1922	359,057	7.42	729,945	729.9	- -	- -	- -	- -	2,800	0.9	377	41.5	- -	- -	29	2.8	77,967,819	10.50	- -	- -
1923	289,539	5.98	814,649	668.1	- -	- -	- -	- -	3,800	1.6	410	57.4	- -	- -	- -	- -	85,920,645	12.60	- -	- -
1924	304,072	6.29	669,641	448.6	2	0.3	- -	- -	14,000	7.1	631	100.9	- -	- -	28	2.6	74,074,207	9.70	- -	- -
1925	307,679	6.36	698,259	482.4	44	3.6	W	W	28,600	15.4	789	140.6	- -	- -	10	1.2	73,055,298	10.30	- -	- -
1926	324,450	6.70	605,190	377.0	22	1.7	W	W	16,000	10.4	778	124.4	- -	- -	3,570	274.5	67,778,000	9.49	- -	- -
1927	286,720	5.97	350,430	215.0	- -	- -	- -	- -	53,400	34.0	1,008	127.0	- -	- -	- -	- -	55,343,000	7.25	- -	- -
1928	331,140	6.85	351,730	187.0	- -	- -	- -	- -	82,000	41.0	1,019	118.0	- -	- -	120	9.0	41,421,000	5.96	- -	- -
1929	375.438	7.76	472.900	252.0	4	0.5	- -	- -	77.200	35.0	1.315	166.0	- -	- -	475	32.0	40.570.000	7.13	- -	- -
1930	408.983	8.47	408.570	157.3	- -	- -	- -	- -	29.400	9.3	1.365	136.5	- -	- -	- -	- -	32.651.000	4.24	- -	- -
1931	459.000	9.51	352.000	102.0	15	1.2	- -	- -	8.200	2.0	1.660	126.0	- -	- -	393	14.0	22.614.000	1.88	- -	- -
1932	493.860	10.20	234.050	66.0	8	0.5	- -	- -	- -	- -	1.260	75.6	- -	- -	- -	- -	8.738.500	0.55	- -	- -
1933	469.286	9.70	154.700	55.0	- -	- -	- -	- -	5.800	2.3	1.157	85.6	- -	- -	605	18.6	29.000	0.02	- -	- -
1934	537.281	8.78	154.700	100.0	- -	- -	- -	- -	8.200[c]	4.3	839	62.1	- -	- -	2.555	85.6	121.000	0.06	- -	- -
1935	469.495	16.43	286.600	206.0	- -	- -	- -	- -	98.800	49.8	815	65.2	- -	- -	8.685	259.6	15.056.000	1.25	- -	- -
1936	540.580	18.92	484.306	375.0	- -	- -	- -	- -	226.000	105.0	941	86.6	- -	- -	5.654	241.9	39.267.000	3.72	- -	- -
1937	627.940	21.98	494.340	382.0	- -	- -	962.000	147.6	372.000[c]	202.3[c]	823	97.1	- -	- -	9.823	313.4	36.007.000	4.74	- -	- -
1938	662.000	23.17	479.853	310.0	8	0.6	444.000	54.8	210.000	89.1	994	91.5	- -	- -	41.000	2.460.0	29.760.000	2.98	- -	- -
1939	676,780	23.68	201,054	136.5	- -	- -	210,000	25.9	66,000	38.0	937	88.1	- -	- -	33,900	2,034.0	278,500	0.04	- -	- -
1940	755,900	26.45	191,679	136.3	156[c]	130.9	306,000	42.8	92,000	52.0	840	72.0	- -	- -	28,886	1,093.0	110,000	0.02	- -	- -
1941	692,314	24.23	199,700	142.0	W	W	774,000	87.3	93,600[c]	61.0[c]	742	58.0	- -	- -	22,630	813.0	144,000	0.02	- -	- -
1942	487,657	17.07	135,200	96.0	W	W	316,000	41.0	5,600	2.5	523	44.0	- -	- -	22,000	779.0	48,000	0.01	- -	- -
1943	99,583	3.49	31,700	22.0	786	153.4	368,000	33.3	2,000[c]	1.0[c]	200	22.0	- -	- -	27,900	1,020.0	54,000	0.01	5,564	186.3
1944	49,296	1.73	15,240	10.8	841	165.0	70,080	30.0	- -	- -	44	5.8	- -	- -	33,616	2,017.0	4,000	0.01	1,845	64.6
1945	68,117	2.38	9,983	6.2	275	180.0	W	W	- -	- -	11	1.8	- -	- -	22,949	1,377.0	10,000	0.01	- -	- -
1946	226,781	7.93	41,793	26.3	699	68.7	W	W	- -	- -	115	25.0	- -	- -	22,882	1,418.7	4,000	0.01	- -	- -
1947	279,988	9.79	66,150	46.3	127	10.6	52,000	16.1	2,000	2.2	255	76.5	226	0.15	13,512	1,351.2	24,000	0.06	- -	- -
1948	248,395	8.69	67,341	58.7	108	7.8	88,000	29.3	10,000	10.8	317	88.9	226	0.15	13,741	1,209.2	28,000	0.07	- -	- -
1949	229,416	8.03	36,056	32.4	102	7.9	88,000	31.3	114,000	100.8	49	11.2	226	0.15	17,169	1,545.2	7,700	0.02	- -	- -

APPENDIX H
continued

Year	Gold (oz)	Gold (m$)	Silver (oz)	Silver (t$)	Mercury (flask[b])	Mercury (t$)	Antimony (lb)	Antimony (t$)	Tin (lb)	Tin (t$)	Lead (tons)	Lead (t$)	Zinc (tons)	Zinc (t$)	Platinum (oz)	Platinum (t$)	Copper (lb)	Copper (m$)	Chromium (tons)	Chromium (t$)
1950	289,285	10.13	52,638	48.0	W	W	W	W	158,000	170.3	144	27.5	--	--	W	W	12,000	0.03	--	--
1951	239,628	8.38	32,870	29.8	28	W	1,718,000	2,061.6	138,000	198.0	21	7.2	--	--	W	W	2,000	0.01	--	--
1952	240,571	8.42	31,825	28.7	40	W	740,000	1,406.0	180,000	243.9	1	0.3	--	--	W	W	--	--	W	W
1953	253,771	8.88	35,387	32.1	1,023	270.0	W	W	98,000	105.9	--	--	--	--	17,489	1,696.4	--	--	W	W
1954	248,511	8.70	33,694	31.8	1,046	276.0	--	--	398,000	409.9	--	--	--	--	18,790	1,615.9	8,000	0.02	2.953	208.0
1955	249,294	8.73	33,693	30.4	43	12.0	--	--	172,000	182.5	1	0.3	--	--	17,253	1,466.5	2,000	0.01	7,082	625.3
1956	204,300	7.33	26,700	24.1	3,414	837.0	134,400	150.0	--	--	1	0.3	--	--	17,934	1,829.3	--	--	7,200	711.5
1957	215,467	7.54	28,862	26.0	5,461	1,349.0	71,120	80.0	--	--	9	3.0	--	--	15,479	1,377.6	--	--	4,207	431.0
1958	186,000	6.53	24,000	22.0	3,380	774.0	--	--	--	--	--	--	--	--	10,284	647.9	10,000	0.03	--	--
1959	171,000	5.99	22,000	20.0	3,750	852.0	--	--	--	--	--	--	--	--	10,698	770.3	72,000	0.04	--	--
1960	180,000	6.30	23,000	21.0	4,450	938.0	W	W	--	--	--	--	--	--	13,352	1,054.8	82,000	0.04	--	--
1961	114,228	3.99	--	--	4,080	816.0	--	--	--	--	--	--	--	--	16,133	1,274.5	184,000	0.06	--	--
1962	165,142	5.78	--	--	3,843	711.0	--	--	--	--	--	--	--	--	12,520	951.5	--	--	--	--
1963	99,000	3.48	6,100	9.0	400	76.0	W	W	--	--	5	1.1	--	--	12,322	961.1	--	--	--	--
1964	58,000	2.05	7,200	6.0	303	95.0	46,400	60.3	--	--	--	--	--	--	13,010	1,522.2	22,000	0.01	--	--
1965	43,000	1.51	5,000	6.0	180	104.0	46,400	60.3	--	--	14	4.0	--	--	10,365	1,368.2	64,000	0.03	--	--
1966	27,325	0.96	7,000	9.0	185	101.0	16,000	19.2	--	--	19	4.3	--	--	9,033	1,273.7	--	--	--	--
1967	22,948	0.80	6,000	9.0	161	79.0	20,000	22.0	--	--	--	--	--	--	7,888	1,238.4	W	W	--	--
1968	21,000	0.81	3,000	6.5	156	78.0	6,000	6.0	--	--	--	--	--	--	8,433	1,652.9	--	--	--	--
1969	21,227	0.88	2,000	4.2	238	100.0	94,000	100.0	--	--	2	0.5	--	--	8,500	2,321.2	--	--	--	--
1970	38,400	1.38	4,000	7.0	3,100	1,260.0	365,000	410.0	--	--	--	--	--	--	6,015	925.1	W	W	--	--
1971	34,000	1.36	2,000	4.0	675	285.0	68,000	74.0	34,000	47.0	--	--	--	--	5,407	625.6	--	--	--	--
1972	8,639	0.56	1,000	2.0	125	44.0	160,000	185.0	W	W	--	--	--	--	6,478	985.5	--	--	--	--
1973	15,000	1.86	13,200	22.0	70	52.5	420,000	515.0	10,000	12.0	6	2.0	--	--	5,524	964.5	--	--	--	--
1974	16,000	2.56	1,500	3.5	70	52.5	80,000	95.0	W	W	--	--	--	--	4,351	1,067.0	--	--	--	--
1975	14,980	3.35	6,000	25.0	--	--	120,000	145.0	22,000	60.0	--	--	--	--	3,726	623.3	--	--	--	--
1976	22,887	6.90	6,500	24.0	--	--	160,000	165.0	W	W	14	6.0	--	--	3,212	515.2	--	--	8,000[c]	1,200.0[c]
1977	50,000	7.80	8,000	20.0	--	--	W	W	W	W	--	--	--	--	6,891	1,119.8	--	--	--	--
1978	60,000	12.00	6,000	50.0	--	--	W	W	W	W	--	--	--	--	--	--	--	--	--	--
1979	65,000	18.00	6,500	93.0	--	--	100,000	125.0	100,000	830.0	--	--	--	--	--	--	--	--	--	--
1980	75,000	32.00	7,500	111.0	--	--	--	--	120,000	984.0	31	29.0	--	--	--	--	--	--	--	--
1981	134,200	55.20	13,420	111.3	W	W	--	--	106,000	700.0	--	--	--	--	900	200.0	--	--	--	--
1982	175,000	69.90	22,000	198.0	--	--	--	--	198,000	1,365.0	--	--	--	--	W	W	--	--	--	--
1983	169,000	67.60	33,200	332.0	--	--	22,400	45.0	215,000	1,100.0	--	--	--	--	W	W	--	--	--	--
1984	175,000	62.13	20,000	159.0	5	1.5	135,000	225.8	225,000	400.0	--	--	--	--	W	W	--	--	--	--
1985	190,000	61.18	28,500	171.0	27	10.0	65,000	98.0	300,000	650.0	--	--	--	--	--	--	--	--	--	--
1986	160,000	60.80	24,000	134.4	12	2.8	45,000	67.5	340,000	890.0	--	--	--	--	W	W	--	--	--	--
1987	229,707	104.51	54,300	391.0	--	--	--	--	288,000	460.0	--	--	--	--	W	W	--	--	--	--
1988	265,500	112.84	47,790	282.0	W	W	--	--	300,000	950.0	--	--	--	--	25	13.8	--	--	--	--
1989	284,617	108.70	5,211,591	27,300.0	--	--	--	NR	194,000	672.0	9,585	7,700.0	19,843	29,400.0	--	--	--	--	--	--
1990	231,700	89.20	10,135,000	50,675.0	--	--	--	--	57,000	200.0	44,220	30,954.0	181,200	253,680.0	--	--	--	--	--	--
1991	243,900	88.29	9,076,854	39,110.0					6,800	22.1	69,591	33,403.7	278,221	278,221.0	15	5.3	--	--	--	--
1992	262,530	88.46	9,115,755	34,913.0	--	--	--	--	1,500	5.9	68,664	31,585.0	274,507	301,957.7	--	--	--	--	--	--
1993	191,265	68.64	5,658,958	24,333.0	--	--	--	--	21,000	50.6	38,221	13,759.6	268,769	236,516.7	3	1.2	--	--	--	--
1994	182,100	70.29	1,968,000	10,391.0	--	--	--	--	--	--	36,447	25,512.9	329,003	296,102.7	5	2.1	--	--	--	--
1995	141,882	56.04	1,225,730	6,655.0	--	--	--	--	--	--	58,098	34,428.6	359,950	345,552.0	1	0.4	--	--	--	--
1996	161,565	62.62	3,676,000	19,078.0	--	--	--	--	--	--	70,086	52,284.0	366,780	361,646.0	2	0.8	780,000	0.80	--	--
1997	590,516	207.29	14,401,165	70,710.0	--	--	--	--	--	--	88,560	49,593.0	419,097	494,888.0	--	--	3,440,000	3.54	--	--
1998	594,191	174.62	14,856,000	82,154.0	--	--	--	--	--	--	102,887	49,386.0	549,348	505,400.0	--	--	3,800,000	2.85	--	--
1999	517,890	144.26	16,467,000	85,628.0	--	--	--	--	--	--	125,208	57,596.0	643,642	630,769.0	--	--	4,200,000	3.00	--	--
2000	546,000	152.39	18,226,615	90,404.0	--	--	--	--	--	--	123,224	51,754.0	669,112	682,494.0	--	--	2,800,000	2.30	--	--
Other[c]	--	--	--	--	1,438	--	--	--	--	--	--	--	--	--	71,946	17,091.9	--	--	--	--
TOTAL	**35,788,310**	**2,741.12**	**130,036,533**	**557,698.0**	**40,945**	**9,910.5**	**11,070,800**	**6,655.1**	**7,287,700**	**12,523.5**	**861,091**	**440,965.9**	**4,360,150**	**4,416,627.6**	**668,548[d]**	**65,815.7**	**1,392,813,932**	**240.52**	**39,051**	**3,426.7**

[a]From published and unpublished state and federal documents.
[b]76-lb flask.
[c]Not traceable by year.
[d]Crude platinum; total production of refined metal is about 575,000 oz.
W = Withheld.
-- = Not reported.
t$ = Thousand dollars.
m$ = Million dollars.

APPENDIX I

Production of industrial minerals, coal, and other commodities in Alaska, 1880-2000

Year	Coal		Sand and gravel		Rock[a]		Barite		Other[b]
	s.tons	m$	s.tons	m$	s.tons	m$	s.tons	t$	$
1880-1899[c]	19,429	0.14	--	--	7,510	0.04	--	--	--
1900	1,200[d]	0.02[d]	--	--	510	0.01	--	--	--
1901	1,300[d]	0.02[d]	--	--	700	0.01	--	--	500
1902	2,212[d]	0.02[d]	--	--	800	0.01	--	--	255
1903	1,447	0.01	--	--	920	0.01	--	--	389
1904	1,694	0.01	--	--	1,080	0.02	--	--	2,710
1905	3,774	0.02	--	--	970	0.02	--	--	740
1906	5,541	0.02	--	--	2,863	0.03	--	--	19,965
1907	10,139	0.05		--	3,899	0.03	--	--	54,512
1908	3,107[d]	0.01[d]	--	--	2,176	0.03	--	--	81,305
1909	2,800	0.02	--	--	1,400	0.01	--	--	86,027
1910	1,000[d]	0.01[d]	--	--	W	W	--	--	96,408
1911	900[d]	0.01[d]	--	--	W	W	--	--	145,739
1912	355[d]	0.01[d]	--	--	W	W	--	--	165,342
1913	2,300	0.01	--	--	W	W	--	--	286,277
1914	1,190	0.01	--	--	W	W	--	--	199,767
1915	1,400	0.03	--	--	W	W	--	--	205,061
1916	12,676	0.05	--	--	W	W	--	--	326,731
1917	54,275	0.27	--	--	W	W	--	--	203,971
1918	75,816	0.41	--	--	W	W	--	--	171,452
1919	60,894	0.35	--	--	50,014	0.29	--	--	214,040
1920	61,111	0.36	--	--	37,044	0.27	--	--	372,599
1921	76,817	0.49	--	--	59,229	0.31	--	--	235,438
1922	79,275	0.43	--	--	54,251	0.30	--	--	266,296
1923	119,826	0.76	--	--	83,586	0.41	--	--	229,486
1924	99,663	0.56	--	--	35,294	0.26	--	--	348,728
1925	82,868	0.40	--	--	32,193	0.19	--	--	454,207
1926	87,300	0.46	--	--	33,283	0.20	--	--	423,000
1927	104,300	0.55	--	--	41,424	0.22	--	--	--
1928	126,100	0.66	--	--	63,347	0.31	--	--	--
1929	100,600	0.53	--	--	54,766	0.26	--	--	194,000
1930	120,100	0.63	--	--	66,234	0.33	--	--	157,300
1931	105,900	0.56	--	--	59,175	0.29	--	--	108,000
1932	102,700	0.53	--	--	54,167	0.27	--	--	223,400
1933	96,200	0.48	--	--	56,291	0.28	--	--	--
1934	107,500	0.45	--	--	64,234	0.36	--	--	46,155
1935	119,425	0.50	--	--	74,049	0.38	--	--	46,755
1936	136,593	0.57	--	--	76,379	0.38	--	--	45,807
1937	131,600	0.55	--	--	50,057	0.25	--	--	147,048
1938	159,230	0.62	--	--	189,090	0.21	--	--	125,302
1939	143,549	0.60	42,332	0.02	--	--	--	--	--
1940	170,174	0.88	515,011	0.10	--	--	--	--	--
1941	241,250	0.97	530,997	0.09	--	--	--	--	1,367,000
1942	246,600	0.99	W	W	--	--	--	--	1,124,000
1943	289,232	1.84	W	W	--	--	--	--	--
1944	352,000	2.37	712,496	0.50	--	--	--	--	2,350,309
1945	297,644	1.87	W	W	--	--	--	--	5,910,704
1946	368,000	2.36	W	W	--	--	--	--	2,005,241
1947	361,220	2.55	W	W	219,000	1.00	--	--	5,927,319
1948	407,906	2.79	W	W	67,341	0.33	--	--	1,257,699
1949	455,000	3.60	W	W	W	W	--	--	7,181,886
1950	421,455	3.03	3,050,020	2.38	W	W	--	--	2,100,000
1951	494,333	3.77	6,818,000	3.54	W	W	--	--	3,600,000
1952	648,000	5.77	6,817,800	3.54	W	W	--	--	9,052,000
1953	861,471	8.45	7,689,014	5.08	47,086	0.17	--	--	1,231,350
1954	666,618	6.44	6,639,638	6.30	283,734	0.47	--	--	1,572,150
1955	639,696	5.76	9,739,214	8.24	265,740	0.29	--	--	1,552,427
1956	697,730	6.37	9,100,000	8.30	50,000	0.02	--	--	1,551,500
1957	842,338	7.30	6,096,000	8.79	528,000	1.95	--	--	2,751,000
1958	759,000	6.93	4,255,000	3.87	615,000	2.07	--	--	695,000
1959	602,000[d]	5.88[d]	5,600,000	5.10	54,000	0.20	--	--	1,338,000

Year	Coal		Sand and gravel		Rock[a]		Barite		Other[b]
	s. tons	m$	s. tons	m$	s. tons	m$	s. tons	t$	$
1960	669,000[d]	5.95[d]	5,892,000	5.35	80,000	0.30	--	--	975,000
1961	650,000[d]	5.87[d]	5,241,000	4.19	--	--	--	--	--
1962	675,000[d]	6.41[d]	5,731,000	5.36	--	--	--	--	--
1963	853,000	5.91	16,926,000	22.01	W	W	W	W	2,589,000
1964	745,000	5.01	26,089,000	18.49	W	W	W	W	4,912,000
1965	860,000[d]	5.88[d]	29,959,000	33.93	W	W	W	W	5,296,000
1966	927,000	6.95	17,457,000	21.79	W	W	44,000	350.0	6,167,000
1967	930,000	7.18	22,300,000	26.25	W	W	W	W	4,924,000
1968	812,000[d]	5.03[d]	17,515,000	20.73	W	W	91,000	W	4,117,000
1969	728,000[d]	4.65[d]	16,205,000	18.62	1,954,000	3.90	90,000	850.0	5,163,000
1970	786,000[d]	5.28[d]	20,375,000[d]	26.07[d]	6,470,000	10.01	134,000[d]	1,875.0	7,994,000
1971	748,000[d]	5.05[d]	26,391,000	41.99	2,658,000	5.07	102,000[d]	1,075.0	--
1972	720,000[d]	6.26[d]	14,187,000	15.21	652,000	3.01	W	W	--
1973	700,000[d]	6.23[d]	19,350,000	19.01	5,967,000	12.00	112,000	1,792.0	12,846,000
1974	700,000	7.34	118,740,000[d]	240.94[d]	5,484,000	12.95	110,000	1,895.0	14,495,000
1975	766,000	7.81	48,145,000	95.78	8,877,000	26.65	2,000[d]	30.0	12,731,000
1976	705,000	8.00	74,208,000[d]	204.73[d]	6,727,000	20.09	W	W	14,019,000
1977	780,000[d]	12.00[d]	66,126,000	134.25	4,008,000	17.47	--	--	14,486,000
1978	750,000	15.00	51,100,000	122.00	3,437,000	14.65	22,000	750.0	--
1979	750,000	16.00	50,900,000	104.90	3,650,000	15.45	20,000	800.0	930,000
1980	800,000	16.00	40,000,000	86.00	3,700,000	15.40	50,000	2,000.0	97,500
1981	800,000	17.60	46,000,000	88.20	4,200,000	19.30	--	--	256,000
1982	830,000	18.00	45,000,000	91.00	3,400,000	15.60	--	--	150,000
1983	830,000	18.00	50,000,000	105.00	5,270,000	25.00	--	--	242,000
1984	849,161	23.75	27,000,000	95.00	2,700,000	16.00	--	--	875,875
1985	1,370,000	39.73	28,184,080	112.06	2,500,000	12.00	--	--	559,000
1986	1,492,707	40.10	20,873,110	75.76	4,200,000	20.32	--	--	384,800
1987	1,508,927	42.35	16,696,374	42.66	1,805,000	11.62	--	--	388,400
1988	1,551,162	44.30	17,264,500	48.75	3,600,000	24.65	--	--	389,000
1989	1,452,353	41.46	14,418,000	39.88	2,914,000	20.34	--	--	1,492,000
1990	1,576,000	44.99	15,013,500	40.82	3,200,000	22.10	--	--	400,000
1991	1,540,000	39.00	14,160,011	45.45	3,000,000	22.50	--	--	462,000
1992	1,531,800	38.30	14,599,746	42.20	2,900,000	22.97	--	--	430,000
1993	1,586,545	38.10	13,162,402	40.64	3,561,324	26.21	--	--	465,000
1994	1,490,000	36.75	13,518,321	40.95	3,843,953	27.04	--	--	459,500
1995	1,640,000	41.30	9,847,550	30.89	2,811,152	22.13	--	--	182,500
1996	1,481,000	38.00	9,890,463	32.20	3,000,045	23.56	--	--	200,000
1997	1,446,000	38.05	13,800,000	51.91	3,200,000	20.00	--	--	217,000
1998	1,339,000	35.23	12,363,450	57.28	1,636,200	14.04	--	--	215,000
1999	1,560,000	41.05	10,600,000	52.42	1,640,000	18.01	--	--	--
2000	1,473,355	38.77	10,600,000	49.86	5,200,000	36.59	--	--	--
Other[d]	--	--	--	--	2,300,000[e]	W	79,000	W	--
TOTAL[f]	**55,647,355**	**970.75**	**1,163,434,000**	**2,506.38**	**123,933,000**	**589.42**	**856,000**	**11,417.00**	**177,761,872**

[a]Building-stone production figures for 1880-1937 are for the southcentral and interior regions of Alaska only.
[b]Includes 2.4 million lb U_3O_8 (1955-71); 505,000 tons gypsum (1905-26); 286,000 lb WO_3 (intermittently 1916-80); 94,000 lb asbestos (1942-44); 540,000 lb graphite (1917-18 and 1942-50); and undistributed amounts of zinc, jade, peat, clay, soapstone, miscellaneous gemstones, and other commodities (1880-1993).
[c]Production not traceable by year.
[d]When state (territorial) and federal figures differ significantly, state figures are used. Figures for sand and gravel production in 1974 show state estimates (118,740,000 s. tons; 240.94 m$) and federal (42,614,000 s. tons; 88.96 m$). The federal estimate was not added to total production.
[e]Marble quarried on Prince of Wales Island, southeastern Alaska (1900-41).
[f]Rounded to nearest 1,000 ton.
m$ = Million dollars.
t$ = Thousand dollars.
-- = Not reported.
W = Withheld.

Above: Stan Dodd logging core at the Uncle Sam project. Gold mineralization is related to Cretaceous-age plutonic rocks at this project near Delta Junction. *(Photo provided by Kennecott Exploration Inc.)*

Top Right: Drilling by Major Alaska Drilling Inc. at North Star Exploration's Elephant Mountain project. Two holes were drilled to test extensions of plutonic-hosted gold and polymetallic mineralization. *(Photo by T.K. Bundtzen, Pacific Rim Geological Consulting.)*

Middle Right: Four NANA/Dynatec drill rigs testing extensions of Cominco's Anarraaq deposit. Drilling in 2000 defined the limits of mineralization on the eastern and southwestern margins of the deposit. *(Photo provided by John Wood, AIDEA.)*

Bottom Right: Bill Williams, Madeline Williams, and Sam Dashevsky at North Star Exploration's IRT (Indian River Trend) property near Hughes. *(Photo by T.K. Bundtzen, Pacific Rim Geological Consulting.)*