

Alaska's Mineral Industry 1999



SPECIAL REPORT 54
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
in cooperation with
Division of Community & Business Development
Division of Mining, Land & Water

A faint, light gray outline map of the state of Alaska serves as a background for the entire page. The map shows the state's coastline, including the Aleutian Islands to the west and the Gulf of Alaska to the south.

Alaska's Mineral Industry 1999

by
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Division of Geological & Geophysical Surveys

SPECIAL REPORT 54

EXECUTIVE SUMMARY

Alaska's Mineral Industry 1999, Special Report 54, is the 19th annual report produced jointly by the Departments of Natural Resources and Community and Economic Development through their Divisions of Geological & Geophysical Surveys (DGGS) and Community & Business Development (DCBD), respectively.

Despite record low prices for several metals, the total value of Alaska's mineral industry, including exploration and development investments and the value of the production, was \$1.119 billion. This is an 8 percent increase from the previous year, and only 4 percent below the previous record of \$1.162 billion in 1997. Of this total, \$52.3 million was invested in exploration, \$33.8 million in development projects, and the products were valued at \$1.033 billion, of which \$921 million consisted of metals.

Exploration expenditures in Alaska in 1999 declined 9 percent to \$52.3 million from \$57.3 million in 1998, but much larger declines were seen in most other areas of the world. Most of these investments were in the eastern interior region of the state, where gold exploration in the region between Fairbanks and the Pogo deposit north of Delta Junction continued at a robust level. The gold resource at Pogo increased 8 percent to 5.6 million ounces following the 1999 drilling program, and an exploration adit was driven about 3,000 feet under the upper of the two major zones. In the Fairbanks district Kinross Gold had a busy season exploring for mill-feed near Fort Knox mine and at the Gil, Ryan Lode, and True North properties. There was also renewed interest in the northern region following the discovery by Cominco of a major new deep zinc-lead-silver deposit north of the Red Dog Mine, and a \$9 million exploration program is scheduled for the 2000 season. Other areas of the state with active 1999 exploration programs included the Seward Peninsula, the Circle district, the Haines area, and near Greens Creek Mine. Exploration for platinum-group metals increased during 1999 in response to record high prices for platinum, palladium, and rhodium. Most of the activity was in the Alaska Range, but some of the known occurrences in southeastern Alaska were also examined.

About 12,793 state mining claims and 1,892 prospecting sites (7,568 claim-equivalents) were staked in 1999, as well as 308 federal mining claims. Most of the activity was near Red Dog Mine and in the Big Delta area west of the Pogo deposit.

Development expenditures in 1999 were \$33.8 million, down 39 percent from the \$55.4 million in 1998, mainly due to the completion of the Production Rate Increase (PRI) project at the Red Dog Mine. Substantial investments were made by Kinross in the Fairbanks district, by Coeur Alaska at Kensington Mine north of Juneau, and by Kennecott/Hecla at Greens Creek Mine. Development projects planned for 2000 suggest that there will be a substantial increase in investment.

Record production of zinc and lead concentrates at Red Dog and Greens Creek mines in 1999 (along with higher base-metal prices) served to offset the decline in both hardrock and placer gold production. During the year the underground Nixon Fork gold mine closed, and the open-pit Illinois Creek hardrock mine was on care-and-maintenance status. There was no production from the major placer mine at Nome, recently acquired by NovaGold Resources, and several small placer mines did not operate due to low gold prices. Nevertheless, the value of production was \$1,032.9 million, of which \$921 million (89 percent) was for metals, and zinc accounted for fully 68 percent of the metal value, or 61 percent of all production. Gold, long the mainstay of Alaska's industry, accounted for about 16 percent of the metal production, or 14 percent of all production. Coal production increased in 1999, as did rock production, but there was a slight decline in the production of sand and gravel.

Alaska's mineral industry provided an estimated 3,166 full-time equivalent jobs in 1999, down 9 percent from the previous year. Most of the decline was in mineral exploration and placer mining.

In 1999 DGGS contracted for an airborne geophysical survey of about 1,000 square miles west and north of Pogo, and for the first time added radiometric equipment to complement the standard magnetic and electromagnetic surveys. As in past years the announcement of the pending survey led to additional land acquisition by several mining companies. A DGGS team began geologic ground-truth mapping of the Fortymile area following the airborne geophysical surveys of 1998 and a joint effort by the U.S. Geological Survey and the state Division of Mining, Land & Water continued baseline water-quality studies in the Fortymile and Goodpaster drainages. Cominco Alaska received the Governor's Exporter of the Year award for 1999, and Wayne Gibson received the Governor's Reclamation Award for his work on Golden Creek in the Melozitna district. Revenues to the State of Alaska and to several municipalities increased from \$14.8 million in 1998 to \$16.9 million in 1999.



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Publication of this report is required by Alaska Statute 41 "to determine the potential of Alaska land for production of metals, minerals, fuels, and geothermal resources; the location and supplies of groundwater and construction materials; the potential geologic hazards to buildings, roads, bridges, and other installations and structures; and shall conduct such other surveys and investigations as will advance knowledge of the geology of Alaska."

NOTE: Mention of any company or brand name does not constitute endorsement by any branch or employee of the State of Alaska.

GOVERNOR'S FOREWORD



Boosted by record production, Alaska's minerals industry had another outstanding year in 1999, with a total value of almost \$1.12 billion, the second highest on record and the fourth billion dollar year in a row. Alaska's mining industry continues to be a major factor in our state's increasingly 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 \$1.119 billion, production accounted for a record \$1.033 billion, of which \$921 million was from metals. 1999 was the first year in Alaska's history that production alone topped the billion-dollar mark. Investment in exploration accounted for \$52.3 million of the industry's overall value and \$33.8 million was spent on development projects.

Record production of zinc and lead concentrates at Red Dog and Greens Creek mines in 1999, combined with higher base-metal prices, offset declines in both hard-rock and placer gold production. The value of production easily topped the previous high of \$936.2 million in 1997.

In all, Alaska's mineral industry provided almost 3,200 high paying, full-time jobs for Alaskans. While that number was down from the previous year, mainly due to the temporary closure of placer mining operations, 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 North America for overall investment attractiveness.

Spending on exploration during 1999 declined 9 percent to \$52.3 million, but larger declines were seen in other mining regions of the world. Exploration investments were primarily in the eastern interior region of the state where gold exploration in the region between Fairbanks and the Pogo deposit north of Delta Junction continued at a robust level. The gold resource at Pogo increased 8 percent to 5.6 million ounces following the 1999 drilling program, and an exploration adit was driven about 3,000 feet under the upper of the two major zones. There was also renewed interest in the northern region following the discovery by Cominco of a major new deep zinc-lead-silver deposit north of the Red Dog Mine.

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. Airborne geophysical surveys and related field programs help point the way to future exploration and development.

The year 1999 continued to be a healthy one for Alaska's mining industry. While challenges to the industry remain, the State of Alaska plans to continue its support and encouragement for this important sector of Alaska's economy.

Governor Tony Knowles

COMMISSIONERS' FOREWORD

Although exploration investment worldwide continued to decline, Alaska was almost immune, with only a slight reduction in exploration in 1999. Highlights included a major new discovery of zinc north of Red Dog, continued excitement at and around the Pogo gold discovery and the Fort Knox Mine near Fairbanks, and greater interest in the platinum-group metals.

The \$1.033 billion value of production for 1999 was over \$100 million greater than for the previous year, mainly due to the increased production of zinc at Red Dog and Greens Creek, and of coal at Usibelli Coal Mine at Healy. Much of the coal, and all of the lead, zinc, and silver is exported, so with the recovery of the world economy, the future looks bright.

With recent reorganization within the Department of Community & Economic Development, we will be better able to define the aspirations of many of the rural communities, and help diversify the local economies. We expect that in many instances mining will play as much of a role as it does in northwest Alaska.

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



1999 was again a year of challenge for Alaska's mineral industry. Metal prices rebounded early in the year only to fall back to lower levels. Despite the relatively low prices industry interest in state mineral land continued to be strong.

Alaska continued to experience robust exploration activity, bucking a worldwide downturn in mineral exploration of 20 to 30 percent. During 1999, approximately \$52.3 million was spent on exploration in Alaska. Roughly 70 percent of these expenditures occurred in the eastern interior region. The Goodpaster mining district was the hub of activity as companies conducted exploration programs on claims staked around the Pogo property.

The Department of Natural Resources (DNR) and the U.S. Geological Survey (USGS) also focused research efforts in the eastern interior region. Geologists from the DNR Division of Geological & Geophysical Surveys began investigations in the Fortymile area to follow up the 1998 airborne survey of this area. Baseline water geochemical sampling and a geological mapping program in the Fortymile and Goodpaster River watersheds were conducted.

In northwestern Alaska, the discovery by Cominco Alaska Inc. of a large, flat-lying zinc-lead-silver deposit 6 miles north of Red Dog Mine continues to define this district as one of the world's premier lead-zinc districts. This discovery on state land further validates the state's selection decisions. More than 6,000 new state mining claims were staked to cover the new deposit. On the Seward Peninsula, DNR offered 28 offshore mining lease tracts near Nome for competitive bid.

DNR's e-commerce efforts have focused on streamlining the annual placer mining permitting process, an effort that will speed up permit issuance. State land status plats are now available on line thanks to the efforts of the DNR Lands Records Information Section. Check it out at <http://www.dnr.state.ak.us/landrecords>.

The mining industry will continue to be a major player in the diversification of the rural economy whether the development occurs on state lands, patented mining claims, or Alaska Native corporation lands. The mineral industry will continue to be a vital player in helping to improve the rural standard of living and create employment opportunities for Alaska's rural residents. We at DNR will continue to help foster this relationship with rural Alaska and the mineral industry while maintaining a pro-active stewardship of Alaska's public lands.

Pat Pourchot, Commissioner, Department of Natural Resources

CONTENTS

Executive Summary	ii
Introduction	1
Employment	2
Acknowledgments	3
Exploration	3
Northern Region	3
Western Region	4
Eastern Interior Region	8
Southcentral Region	13
Southwestern Region	15
Southeastern Region	15
Development	15
Northern Region	15
Western Region	15
Eastern Interior Region	17
Southcentral Region	17
Southeastern Region	18
Production	18
Northern Region	23
Metals	23
Industrial Minerals	25
Western Region	25
Metals	25
Industrial Minerals	26
Eastern Interior Region	26
Metals	26
Coal	26
Industrial Minerals	27
Southcentral Region	27
Metals	27
Industrial Minerals	27
Southwestern Region	27
Metals	27
Industrial Minerals	27
Southeastern Region	28
Metals	28
Industrial Minerals	28
Drilling	28
Government Actions	30
Appendixes	
A. New claims staked in Alaska, 1995–99	33
B. Prospecting sites in Alaska, 1995–99	35
C. Mining licenses issued by and received from the Alaska Department of Revenue	37
D. Selected significant mineral deposits and mineral districts in Alaska	50
E. State and federal agencies and private interest groups involved in mineral development activities	60
F. Alaska mining websites	67
G. U.S. customary units and metric units conversion chart	69
H. Primary metals production in Alaska, 1880–1999	70
I. Production of industrial minerals, coal, and other commodities in Alaska, 1880–1999	72

CONTENTS

Figures

1. Graph showing exploration and development expenditures and the value of production of Alaska mineral industry, 1981–99	1
2. Chart showing 1999 mineral industry employment by category	2
3. Map showing regions of mineral activity in Alaska as described in this report	3
4. Chart illustrating 1999 exploration expenditures by commodity	5
5. Map showing selected mineral exploration projects in Alaska, 1999	6
6. Photo showing core drilling for gold mineralization on the Fred Creek prospect at Mt. Distin	7
7. Photo showing work on the face in the Pogo decline	9
8. Photo showing composite of the Liese 1½ vein, a newly discovered vein exposed in the Pogo decline	10
9. Photo showing early construction of Pogo decline and portal facilities	11
10. Photo showing Era helicopter landing at American Copper & Nickel Co. drill site on south face of Tiger Mountain	12
11. Photo showing Era helicopter performing an airborne geophysical survey	14
12. Map showing selected mineral development projects in Alaska, 1999	17
13. Graph showing sand and gravel production in Alaska, 1950–99	21
14. Graph showing amount and value of gold production in Alaska, 1880–1999	21
15. Graph showing coal production in Alaska, 1915–99, including exports to Korea	21
16. Map showing selected production projects, 1999	22
17. Photo showing aerial view of the Main Deposit pit and support facilities at Red Dog Mine	25
18. Photo showing rock being loaded onto a barge bound for Dillingham	26
19. Photo showing view of ore processing facilities at Kinross Gold Corp.'s Fort Knox Mine	27
20. Photo showing view of office, shop, and milling complex at Fort Knox Mine	27
21. Photo showing work on TJ Enterprises reverse-circulation drill rig	29
22. Photo showing underground drilling station in Pogo decline	29
23. Photo showing inflatable kayak beached on gravel bar along Dennison Fork of the Fortymile River	31
24. Photo showing reclamation of Golden Creek in the Melozitna mining district	32
25. Photo showing reclamation of Golden Creek in the Melozitna mining district	32

CONTENTS

Tables

1. Total value of the mineral industry in Alaska by year (in millions of dollars)	1
2. Estimated Alaska mine employment, 1992-99	2
3. Reported exploration expenditures and employment in Alaska, 1999	4
4. Reported exploration expenditures in Alaska by commodity, 1982-99	5
5. Summary of claim activity, 1984-99	7
6. Red Dog ore reserves	7
7. Reported mineral development expenditures and employment in Alaska by commodity and region, 1999	16
8. Reported mineral development expenditures in Alaska by commodity, 1982-99	16
9. Estimated mineral production in Alaska, 1997-99	18
10. Companies and individuals reported to be producing metal in Alaska, 1999	19
11. Average metal prices, 1993-99	22
12. Reported refined gold production, number of operators, and industry employment, 1997-99	23
13. Production for selected Alaska placer gold mines, 1993-99	23
14. Reported sand and gravel production and industry employment in Alaska by region, 1999	24
15. Reported rock production and industry employment in Alaska by region, 1999	24
16. Cominco Alaska's Red Dog Mine production statistics, 1989-99	25
17. Fort Knox Gold Mine production statistics, 1996-99	26
18. Greens Creek Mine production statistics, 1989-99	28
19. Drilling footage by region in Alaska, 1999	28
20. Drilling footage reported in Alaska, 1982-99	29
21. Companies reporting significant drilling programs in Alaska, 1999	29
22. Revenues paid to the State of Alaska and municipalities by Alaska's mineral industry, 1994-99	30
23. Table of airborne geophysical survey work contracted by DGGS	31

Alaska's Mineral Industry 1999

R.C. Swainbank,¹ D.J. Szumigala,² M.W. Henning,³ and F.M. Pillifant⁴

INTRODUCTION

This summary of the 1999 Alaska mineral industry is made possible by information provided through replies to questionnaires mailed by the Alaska Division of Geological & Geophysical Surveys (DGGs), phone interviews, press releases, and other information sources. Funding for production of the report is 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 1999 calendar year is the 19th 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 investments, and the value of the mined products. As in past years, 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

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

	Exploration (expenditure)	Development (expenditure)	Production (value)	Total
1981	\$ 76.0	\$ 26.4	\$ 188.6	\$ 291.0
1982	45.0	41.6	196.4	283.0
1983	34.1	27.8	232.4	294.3
1984	22.8	53.6	199.4	275.8
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	552.7
1989	47.8	134.3	277.0	459.1
1990	63.3	14.3	533.0	610.6
1991	39.9	25.6	546.5	612.0
1992	30.2	30.0	560.8	621.0
1993	30.3	27.7	448.7	506.7
1994	31.1	44.9	507.5	583.5
1995	34.3	148.6	537.2	720.1
1996	44.6	394.0	590.4	1,029.0
1997	57.8	168.4	936.2	1,162.4
1998	57.3	55.4	920.2	1,032.9
1999	52.3	33.8	1,032.9	1,119.0
TOTAL	\$746.1	\$1,660.1	\$8,566.9	\$10,973.1

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

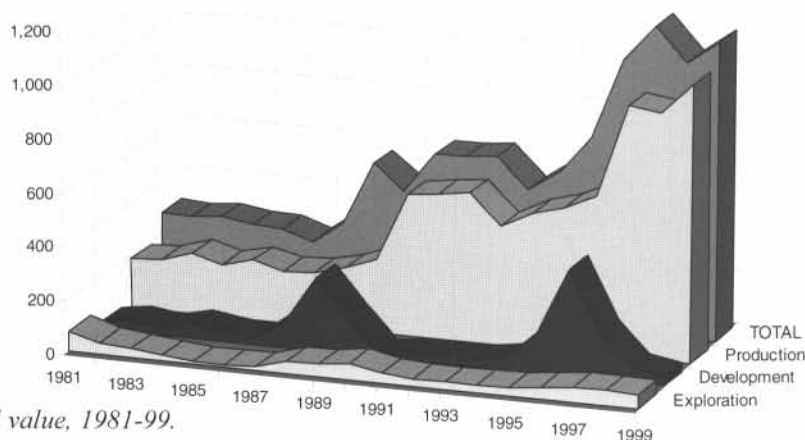


Figure 1. *Alaska's mineral industry total value, 1981-99.*

¹Alaska Division of Community & Business Development, Unit #7, 3677 College Road, Fairbanks, Alaska 99709-3732.

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to calculate the value of production. Forward sales at higher-than-spot prices are used if reported by a company. These values do not take into account the costs of mining and transportation, or smelter charges and penalties.

Mining companies sometimes report in metric units, but this report uses only U.S./English units. A conversion table is provided in Appendix G. In some instances values are reported as parts per million or parts per 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.

The 1999 cumulative value of the Alaska minerals industry is \$1.119 billion, an 8 percent increase compared with \$1.033 billion in 1998, and only 4 percent less than the record \$1.162 billion in 1997. Record metal production (\$921.2 million in 1999 versus \$814.4 million in 1998)

was offset by a decline in both exploration (\$52.3 million in 1999 versus \$57.3 million in 1998) and development (\$33.8 million in 1999 versus \$55.4 million in 1998) (table 1; fig. 1). Record production of zinc from both Red Dog and Greens Creek mines (\$630.8 million in 1999 versus \$505.4 million in 1998) more than compensated for the lower value of gold production (\$144.3 million in 1999 versus \$174.6 million in 1998). Fort Knox Mine near Fairbanks is Alaska's largest gold producer with an average daily production of approximately 1,000 ounces of gold.

EMPLOYMENT

The estimated total employment by the Alaska mineral industry was 3,166 full-time-equivalent jobs (table 2; fig. 2). This is a decline of 311 (9 percent) from the 3,477 jobs

Table 2. *Estimated Alaska mine employment, 1992–99^a*

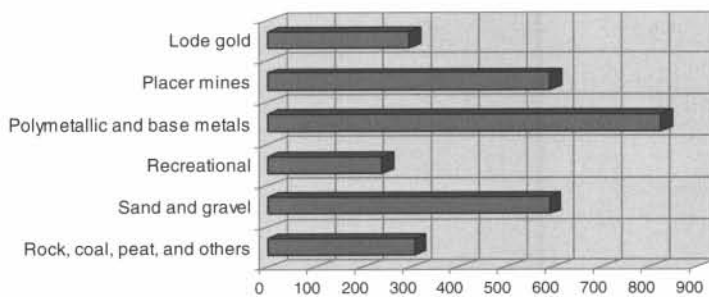
	1993	1994	1995	1996	1997	1998	1999
Gold/silver mining							
Placer	1,205	1,150	975	825	780	710	591
Lode	N/A	--	38	138	415	345	296
Polymetallic	26	--	--	68	230	275	275
Base metals	376	311	397	407	478	466	549 ^b
Recreational	270	280	255	260	270	255	240
Sand & gravel	580	640	577	598	700	658	590
Rock	205	210	200	149	123	121	128
Coal	109	115	120	115	118	128	121
Peat	49	55	30	38	42	40	38
Tin, jade, soapstone, ceramics, platinum	20	25	20	20	20	20	20
Mineral development	132	115	637	862	409	177	135
Mineral exploration	164	182	157	257	277	282	183
TOTAL	3,136	3,083	3,406	3,737	3,862	3,477	3,166

^aCalculated on a 260-day work year.

N/A = Not available.

-- Not reported.

Production Employment



1999 Total: 3,166 full-time-equivalent jobs

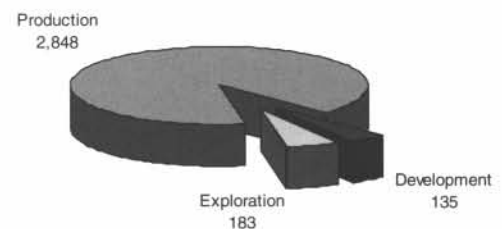


Figure 2. 1999 mineral industry employment by category.

in 1998. Most of the decline was in the precious metals sector, with the closure of the large placer gold mine at Nome, and the hardrock mines at Nixon Fork near McGrath and Illinois Creek Mine near Galena. There was a 23 percent drop in mineral development jobs and a 33 percent drop in mineral exploration jobs from 1998 to 1999.

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.

DGGS mailed approximately 1,000 questionnaires in November 1999, and received 187 replies. Dick Swainbank (DCBD) and Dave Szumigala (DGGS) prepared the body of the text, tables, and appendices with the assistance of Frankie Pillifant (DCBD) and Mitch Henning (DMLW).

The cover design is by Joni Robinson, and graphic illustrations are by Alfred Sturmman and Joni Robinson. Paula Davis edited the final version, and Joni Robinson completed the layout and design. Publication was made possible by funds from the Division of Community & Business Development.

EXPLORATION

Estimated minimum exploration expenditures throughout Alaska during 1999 were \$52.3 million, down 9 percent from the \$57.3 million invested in 1998. Alaska's exploration sector fared quite well, considering the massive reductions (20–25 percent) in exploration budgets worldwide. 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 18 years are listed in table 4. Figure 4 is a graphical representation of exploration expenditures by commodity. Figure 5 shows the location of significant exploration projects in Alaska during 1999. Sixty-nine percent of exploration expenditures were spent in the eastern interior region of Alaska. The Goodpaster mining district was the hub of exploration activity as companies conducted initial exploration programs on claims staked around the Pogo property in 1998.

About 12,793 new state mining claims, 1,892 new state prospecting sites (7,568 claim-equivalents), and 308 new federal claims were staked in Alaska in 1999. An additional 2,060 prospect sites (8,240 claim-equivalents) were extended for another year. Table 5 summarizes the number of claims staked and current from 1984 through 1999. It has been modified to account for new data generated by the Department of Natural Resources' Land Records Information Section. Most of the claim staking (appendixes A and B) was north of the Red Dog Mine and in the area between Fairbanks and Big Delta, and the majority of the prospecting sites were to the east of Fairbanks.

NORTHERN REGION

Cominco Alaska Inc. had a large diamond drill program in 1999 and announced a new large, flat-lying zinc–lead–silver deposit, named Anarraaq, located about six miles north of Red Dog Mine. The discovery of Anarraaq was the result of an integrated geophysical and geologic effort and it is the first high-grade discovery outside of the Red Dog mineral system. Drill intercepts up to 240 feet thick with 20 percent zinc and 5 percent lead were found at approximately 2,200 feet below the surface in holes spaced between 800 and 900 feet apart. Mineralization is open in all directions except to the southeast. Eight of nine core holes drilled to target depth intersected significant massive sulfide mineralization. Two holes were

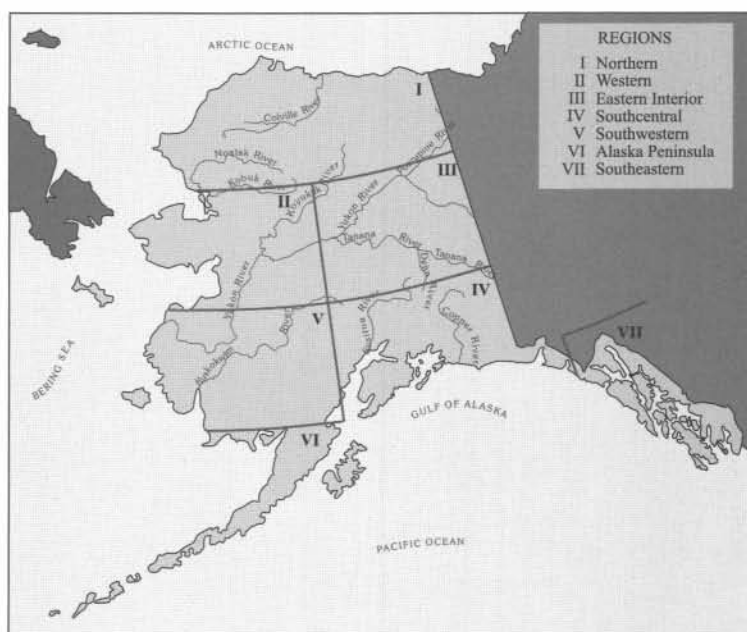


Figure 3. Regions of mineral activity in Alaska as described in this report.

stopped short of target depth and will be completed next year. Best mineralized intercepts include 30 percent zinc and 6 percent lead between 2,227 and 2,280 feet in hole 806; 15 percent zinc and 5 percent lead between 2,182 and 2,202 feet in hole 808; 18 percent zinc and 5 percent lead between 2,229 and 2,459 feet in hole 809; and 20 percent zinc, 5 percent lead, and 4 ounces per ton silver between 2,160 and 2,400 feet in hole 810.

The Anarraaq deposit lies within a large, 2 milligal gravity anomaly that defines the areal extent of a large (over 1 billion tons) barite body overlying the deposit. The barite and sulfides are separated by a thrust fault and 300 feet of barren shale. Mineralization consists of banded to massive sphalerite, galena, and pyrite. A preliminary interpretation of the Anarraaq mineralization by Cominco suggests the possibility of 13.2 million tons grading 18 percent zinc, 5 percent lead, and 2.89 ounces of silver per ton. Anarraaq is slightly lower grade than the main Red Dog ore body, but it will increase the grade of total ore reserves in the Red Dog area (table 6). The new discovery occurs on state-owned lands, unlike the present mine that is located on NANA Regional Corp. (First Nation) lands. Over 6,000 new state mining claims were staked to cover this potential new deposit that would need to be mined from an underground facility.

In addition to the Anarraaq discovery, Cominco's regional exploration program identified several other attractive drill targets. Additional exploration drilling is expected to outline the Anarraaq deposit and search for additional deposits within the region. Cominco is also considering drilling to evaluate the potential for natural gas in shale deposits near Red Dog Mine. Cost savings

from using natural gas instead of imported diesel could make marginal deposits profitable and reduce environmental risks.

Kennecott Minerals continues to evaluate the Bornite and Arctic deposits in the Ambler mineral belt. Drilling results at Arctic in 1998 were encouraging, and a new geologic model suggests that mineralization extends deeper. No work was done in 1999, but the company is considering the possibility of developing Arctic as an open-pit and underground mine. Lack of access to transportation remains the key problem to making Bornite and Arctic viable mining operations.

WESTERN REGION

Exploration was quite active on the Seward Peninsula during 1999. NovaGold Resources Inc. drilled the Anvil Creek area north of Nome in a \$500,000 program funded by Kennecott Exploration Co. in a region with more than 3 million ounces of historic placer gold production. Rich placer production from Anvil Creek overlies a flexure in a major structural feature—the Anvil Creek shear zone. The shear zone is coincident with quartz–carbonate–sulfide stockwork veins and pervasively silicified schist along the valley bottom. At least 7,000 feet of reverse-circulation drilling was completed in 32 holes. Drill intercepts included multiple 5-foot intervals averaging up to 0.277 ounces per ton gold, with northwest-trending drill fences spaced from 2,000 to 4,000 feet apart. Kennecott withdrew from the joint-venture agreement after drilling results did not meet expectations.

NovaGold optioned part of its Rock Creek gold deposit nearby to Viceroy Resource Corp. and continued to

Table 3. Reported exploration expenditures and employment in Alaska, 1999

	Northern	Western	Eastern interior	South-central	South-western	South-eastern	Total
Exploration expenditures							
Placer	\$ 12,000	\$ 73,000	\$ 130,000	\$ 25,000	\$ --	\$ 40,000	\$ 280,000
Lode	3,600,000	4,329,000	36,447,000	1,242,000	4,384,000	2,057,000	52,059,000
TOTAL	\$3,612,000	\$4,402,000	\$36,577,000	\$1,267,000	\$4,384,000	\$2,097,000	\$52,339,000
Exploration employment							
Employment							
Workdays	3,878	2,170	30,359	1,890	8,082	1,203	47,582
Workyears ^a	15	8	117	7	31	5	183
Number of companies reporting ^b	3	13	55	17	6	10	104

-- Not reported.

^aBased on 260-day workyear.

^bSome companies were active in several areas.

No exploration expenditures or employment reported for Alaska Peninsula in 1999.

act as operator on the project. A six-hole reverse-circulation drilling program included twinning previous holes and the recent results are 59 percent higher than previous results. Other highlights from the drilling include intercepts of 135 feet with 0.07 ounces per ton gold (including 40 feet with 0.186 ounces per ton gold), 150 feet with 0.071 ounces per ton gold (including 35 feet with 0.114 ounces per ton gold), and 145 feet with 0.04 ounces per ton gold (including 15 feet with 0.114 ounces per ton gold). The measured, indicated, and inferred resource at Rock Creek is presently 740,000 ounces of gold grading 0.081 ounces

per ton gold using a cut-off grade of 0.03 ounces per ton. There is an additional inferred resource of 260,000 ounces of gold at a gold grade of 0.065 ounces per ton at the Saddle deposit 1.8 miles to the southeast. Metallurgical testing indicates that mineralization consists of native gold, pyrite, sulfosalt minerals, and arsenopyrite. Gold recoveries using cyanide averaged between 91 and 98 percent, with 37 to 86 percent (dependent on two main ore types) recovery possible using a gravity circuit at a 65-mesh grind.

NovaGold Resources Inc. also announced a 2-million-ounce placer gold resource on its Nome patented mining

Table 4. Reported exploration expenditures in Alaska by commodity, 1982–99

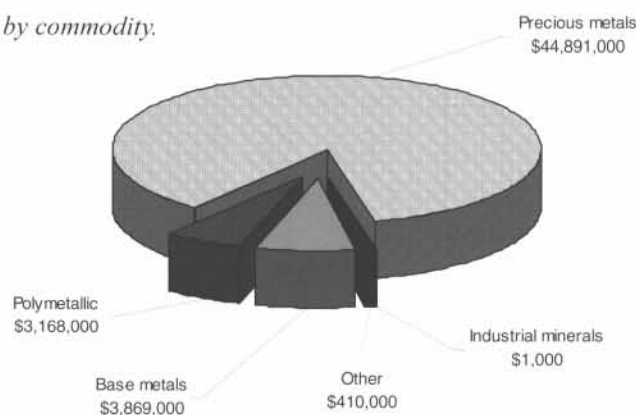
	Base metals	Polymetallic ^a	Precious metals	Industrial minerals	Coal and peat	Other	Total
1982	\$31,757,900	\$ N/A	\$ 10,944,100	\$ --	\$ 2,900,000	\$ 15,300	\$ 45,617,300
1983	9,758,760	N/A	20,897,555	2,068,300	1,338,454	70,000	34,133,069
1984	4,720,596	N/A	14,948,554	270,000	2,065,000	279,500	22,283,650
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
TOTAL	\$80,853,566	\$79,111,161	\$487,001,743	\$4,548,000	\$16,877,750	\$1,847,800	\$670,240,020

^aPolymetallic deposits considered as a separate category for the first time in 1992.

N/A = Not available.

-- Not reported.

Figure 4. 1999 exploration expenditures by commodity.



claims in marine beach and alluvial deposits. The resource was estimated using a modified polygonal method with data derived from 7,248 churn drill holes and over 70 years of historic production records. NovaGold believes that alternative stripping and mining methods, as well as improvements in fine gold recovery, could reduce overall mining costs and significantly enhance revenues.

Farther north at Mt. Distin (fig. 6), Consolidated Aston Resources Ltd. drilled 24 reverse-circulation holes for a total of 6,244 feet at the Fred Creek prospect and conducted other exploration work across the rest of the Mt. Distin property. Consolidated Aston is party to an exploration agreement and option to lease with Bering Straits Native Corp. (First Nation) and its subsidiary, Golden Glacier Inc. Drilling results are interpreted to reveal a strongly

disseminated gold system that is tabular, crudely stratiform, and hosted by metasedimentary rocks. The mineralized zone is up to 285 feet thick, and can be traced along strike for at least 1,640 feet and down-dip 330 feet. Gold assay results are remarkably consistent, with many holes mineralized over their entire length. For example, hole MDRC-99-13 averaged 0.012 ounces per ton gold from collar to 308-foot depth, and hole MDRC-99-11 averaged 0.010 ounces per ton gold from collar to 308-foot depth. Gold grades and thickness appeared to increase down-dip. Consolidated Aston believes that the pattern of mineralization is consistent with a leakage halo emanating from a down-dip mineralized source along the main structural trend. The company also conducted a phase 2, four-hole, core-drilling program on the Fred Creek gold target. Core

I Northern Region

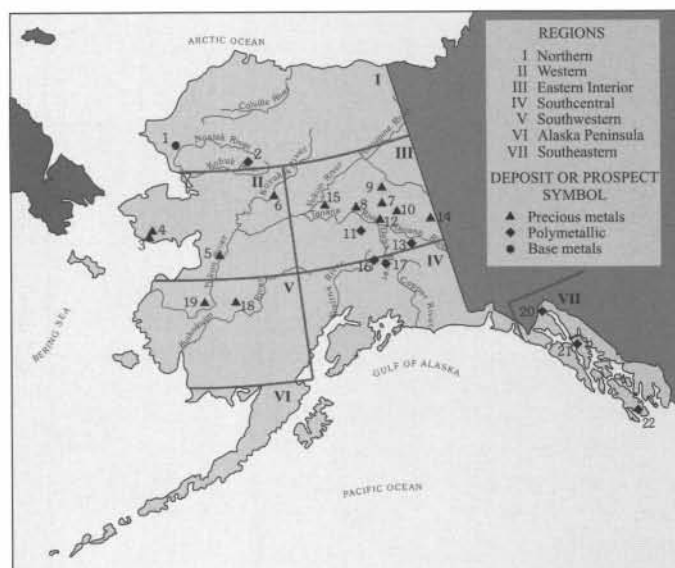
1. Red Dog Mine/District—Cominco Alaska Inc.
2. Arctic deposit—Kennecott Minerals Co.

II Western Region

3. Nome area—NovaGold Resources Inc./Kennecott Exploration Co./Viceroy Resource Corp.
4. Mt. Distin—Consolidated Aston Resources Ltd., Altar Resources
5. Kaiyah—North Star Exploration Inc.
6. Indian River—North Star Exploration Inc.

III Eastern Interior Region

7. Salcha River area—NovaGold Resources Inc., Camnor Resources Ltd., Oromin Exploration Ltd.
8. Fairbanks district
 - a. Fort Knox—Kinross Gold Corp.
 - b. Gil claims—Kinross Gold Corp./Teryl Resource Corp.
 - c. General—Kinross Gold Corp.
9. Circle district—Copper Ridge Explorations Inc./Camnor Resources Ltd., Golden Phoenix Mineral Inc., Newmont Exploration Ltd.
10. Pogo
 - a. Pogo—Teck Corp./Sumitomo Metal Mining America Inc.
 - b. Pogo/Goodpaster area—Numerous companies
11. Bonfield district—Grayd Resource Corp., Camnor Resources Ltd., Oromin Exploration Ltd.
12. Richardson district—Kennecott Exploration Co., Placer Dome Exploration Inc., Golden Phoenix Alaska Inc., Tri-Valley Corp.



13. Delta Mineral Belt—Grayd Resource Corp.
14. Fortymile district (Napoleon project and general)—Kennecott Exploration Co.
15. Elephant Mountain—North Star Exploration Inc.

IV Southcentral Region

16. Caribou Dome (Denali Copper)—Atna Resources Ltd.
17. Nikolai Mafic-Ultramafic Belt—M.A.N. Resources Inc./Nevada Star Resource Corp., Fort Knox Gold Resources Inc./Inco Ltd.

V Southwestern Region

18. Donlin Creek—Placer Dome Exploration Inc.
19. Stuyahok—Placer Dome Exploration Inc.

VI Alaska Peninsula Region

VII Southeastern Region

20. Palmer claims—Rubicon Minerals Corp.
21. Greens Creek—Kennecott Minerals Co./Hecla Mining Co.
22. Niblack—Abacus Minerals Inc./Teck Corp.

Figure 5. Selected exploration projects in Alaska, 1999.

Table 5. Summary of claim activity, 1984–99

Year	New Claims			Active Claims			Total Claims		
	State	Federal	Subtotal	State	Federal	Subtotal	State	Federal	Total
1984	5,236	3,111	8,347	na	na	78,612	na	na	86,959
1985	4,219	2,554	6,773	na	na	75,009	na	na	81,782
1986	3,579	1,739	5,318	na	na	65,705	na	na	71,014
1987	5,002	3,274	8,276	na	na	60,072	na	na	68,348
1988	8,062	3,786	11,848	na	na	63,694	na	na	75,542
1989	3,928	1,664	5,592	na	na	64,123	na	na	69,715
1990	2,573	1,888	4,461	32,275	25,792	58,067	34,848	27,680	62,528
1991	3,273	1,299	4,572	35,191	23,222	58,413	38,464	24,521	62,985
1992	2,640	695	3,335	34,281	20,254	54,535	36,921	20,949	57,870
1993	2,110	601	2,711	32,781	9,298	42,079	34,891	9,899	44,790
1994	4,056	341	4,397	31,703	8,495	40,198	35,759	8,836	44,595
1995	4,508	376	4,884	27,250	7,766	35,016	31,758	8,142	39,900
1996	9,488	681	10,169	28,273	9,346	37,619	37,761	10,027	47,788
1997	8,671	1,872	10,543	35,219	11,320	46,539	43,890	13,192	57,082
1998	9,776	427	10,203	40,579	11,033	51,612	50,355	11,460	61,815
1999	12,793 ^a	308	13,101	44,583	10,176	54,759	57,376	10,484	67,860

^aAn additional 1,892 prospecting sites, equivalent in area to 7,568 mining claims, were located in 1999, and 2,060 existing prospecting sites (8,240 claim equivalents) were extended for a second year.

Federal claims = 20 acres, State claims = 40 acres, State prospecting sites = 160 acres.

na - Specific data regarding State and Federal claims not available.

Information post 1990 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. Data prior to 1990 from Special Reports 40 and 44.

drilling totaled 2,267 feet with best results of 87 feet of 0.014 ounces per ton gold in hole MDC99-10 and 421 feet grading 0.10 ounces per ton gold in hole MDC99-11. To date, the Fred Creek prospect has a preliminary, estimated gold resource of 74,000 ounces at an average grade of 0.016 ounces per ton gold with a cut-off grade of 0.01 ounces per ton gold. The estimate was prepared using a cross-sectional method.

Altar Resources explored its Divide gold prospects and several base-metal showings. Pan sampling on the Divide property continued definition of a placer gold resource. During 1999 Altar Resources hand excavated and bulk sampled five pits that extended mineralized bedrock to a total distance of 2,300 feet with an average gold content of 0.02 ounces per ton. Geologic mapping at a 1:1,000 scale by Dr. Wyatt Gilbert on the Bulk Gold prospect reveals a spatial relationship between feldspathic orthogneiss (metagranite) and gold anomalies. Three shallow Winkie AX core holes were drilled at the Bulk Gold prospect for a total of 260 feet. Drillhole 99BGDH3 confirmed the presence of anomalous gold up to

Table 6. Red Dog ore reserves^a

	Tons (millions)	Zinc (wt%)	Lead (wt%)	Silver (oz/ton)
Main (Proven & Probable)	51.2	19.0	5.2	2.95
Aqqaluk (Possible)	80.4	13.6	3.7	1.90
Hilltop (Indicated)	10.6	17.8	5.5	3.41
Paalaaq (Inferred)	14.3	15.0	4.0	2.63
Total/Average	156.5	15.8	4.3	2.42

^aAs of December 31, 1999 from Cominco 1999 Annual Report.

Figure 6. Core drilling by TJ Enterprises for gold mineralization on the Fred Creek prospect at Mt. Distin. Phase 2 of Consolidated Aston Resources Ltd.'s exploration drilling program. Photo provided by Tom Sparks, Bering Straits Native Corp.



0.0375 ounces per ton, with 9,310 parts per million arsenic, and 7,170 parts per million antimony in a five-foot intercept, and an average of 0.02 ounces per ton gold over the entire 55-foot depth. Altar subsequently optioned the Bulk Gold property to Consolidated Aston Resources Ltd.

Altar also conducted exploration on the Midas Well property on the east side of the Mount Distin property. A coincident gold, arsenic, and antimony anomaly was identified by 80 mobile metal ion soil geochemical samples and 12 conventional soil samples. The geochemical anomaly is coincident with a northeast-trending magnetic anomaly on the DGGs airborne magnetic map of the Nome D-2 Quadrangle. Noranda Mining and Exploration Inc. conducted several days of sampling on Altar's Think Zinc and Metal Heaven base-metal properties.

Viceroy Alaska, a division of Viceroy Resources Corp., conducted exploration at the Illinois Creek Mine near Galena as part of its evaluation of the deposit.

North Star Exploration Inc. discovered a new gold-silver epithermal prospect approximately 80 miles southwest of Galena on the west side of the Yukon River. North Star's Kaiyah prospect consists of 80 state claims and 17 state prospecting sites totaling 5,920 acres. Host rocks include sandstone, shale, and conglomerate of the Koyukuk terrane adjacent to the Poison Creek caldera. Volcanic rocks include intermediate to felsic ash flow tuffs, massive basaltic andesite, and a small area of siliceous sinter. Anomalous gold and silver values occur in outcropping silicified sedimentary units cut by radial faults immediately east of the caldera rim. Structural analysis from fused Landsat and total field magnetic data suggests that the caldera system may extend over 12 miles in diameter.

North Star collected 236 rock samples at Kaiyah, and 46 samples contained over 0.003 ounces per ton gold. Gold values ranged up to 0.30 ounces per ton and silver values ranged up to 13.6 ounces per ton. Arsenic and bismuth values are elevated with higher precious-metal values, and mercury occurs in the low parts per million range. Silica veining was mapped in a structurally bounded zone that is 9,000 feet long and averages 4,000 feet wide. The upper part of the mineralized system consists of vuggy silica with open spaces lined by comb quartz; 300–400 feet lower in the system, silicification is characterized by stockwork veinlets and quartz flooding as a dense matrix. Altered areas contain pervasive alunite, jarosite, and sericite. Some steeply dipping veins are over 100 feet thick.

North Star also explored on Doyon Ltd.'s land near the village of Hughes on the east bank of the Koyukuk River. Fieldwork on the Indian River property identified an altered granodiorite body. The granodiorite exposure coincides with magnetic and resistivity geophysical anomalies. North Star believes that the granodiorite may be the source of the Indian River placer gold deposits.

North Star also worked on several properties within Doyon's Block 20 along the Yukon River. The Windy Creek zinc prospect is on the northwest side of the Yukon River near Senatis Mountain, approximately 25 miles north-northeast of Tanana. During 1999, North Star extended an 8,000-foot zinc soil anomaly outlined by WGM in 1977 to almost five miles in length, with a maximum width of 700 feet. Two new areas of bedrock zinc mineralization were discovered: a mineralized carbonate breccia that assayed 3.6 percent zinc and 0.2 percent lead, and a gossanous area with up to 3.18 percent zinc. Float samples of massive pyrite with sphalerite are common in the area. The target model is a carbonate replacement deposit, possibly a skarn, related to a nearby Cretaceous granite body.

EASTERN INTERIOR REGION

The biggest news from the Fairbanks district was the announcement that Kinross Gold Corp. completed acquisition of Newmont Exploration's rights in the 1.3-million-ounce True North gold project. Kinross paid \$28 million to buy back 100 percent interest in the deposit. The property had been part of a joint venture between Newmont and La Teko Resources; the latter company was recently acquired by Kinross. Newmont had expended about \$19 million at the True North property since taking over project management in 1995. Kinross immediately began evaluating the deposit with respect to trucking ore to the Fort Knox mill. True North ore grades are nearly three times that of Fort Knox ore. Production from True North is projected to increase annual production through the Fort Knox mill by about 100,000 ounces of gold. Kinross also acquired the adjacent Whiskey Gulch property from Silverado Gold Mines Ltd. in exchange for a net smelter royalty based on gold price at production.

Kinross Gold and 20 percent joint venture partner Teryl Resources announced drilling results for their Main Gil and North Gil prospects; indicated and inferred resources stand at 10.7 million tons grading 0.040 ounces per ton (433,000 ounces of gold). Drilling consisted of five diamond core holes (3,911 feet) and nine reverse-circulation holes (4,038 feet). Highlights of drilling at Gil North include 65 feet grading 0.041 ounces per ton and 75 feet grading 0.043 ounces per ton. Significant intercepts at the Main Gil prospect included 40 feet grading 0.068 ounces per ton and 120 feet grading 0.036 ounces per ton. Geophysical data interpretation indicated previously unknown geologic structures with east-west and northeast trends, and exploration targets on the east side of Slippery Creek and in All Gold Creek. Soil sampling outlined new areas with anomalous gold values in the North Gil area and in the eastern portion of the Gil Venture claim block. Kinross and Teryl also conducted some exploration on the West Ridge property abutting the southern boundary of the True North property. Kinross conducted a limited reverse-

circulation drilling program on the Amanitaville property south of Fort Knox Mine, with best drill intercepts of 50 feet of 0.08 ounces per ton of gold, 50 feet of 0.29 ounces per ton of gold, and 90 feet of 0.04 ounces per ton of gold.

The Goodpaster mining district to the east of Fairbanks was the locus of most exploration activity during 1999. The Pogo deposit, a 5.2-million-ounce gold prospect being evaluated by Teck Corp. and partner Sumitomo Metal Mining, was the largest exploration project in Alaska during 1999. An underground exploration permit from state and federal agencies was received in March and development work immediately began on the adit (fig. 7). Plans are to dig approximately 5,200 feet into the hillside (Pogo Ridge) hosting the Liese 1 zone orebody. The adit will intersect the Liese 1 zone (fig. 8), the uppermost of three known mineralized zones on the project. Access to the Liese 1 zone will allow collection of a bulk sample for metallurgical testing purposes, obtain geotechnical data, and test continuity of ore bodies. Drilling from the Liese 1 level will attempt to better define the deep Liese 3 zone previously intersected in two holes drilled from the surface. Teck had excavated approximately 3,000 feet of the adit, drilled a shaft pilot hole to 2,500 feet and completed a pre-feasibility study by the end of 1999 (fig. 9).

Teck also conducted a \$2.6 million surface exploration program on the 1,200-claim Pogo property. Sixty-four diamond core holes, totaling 50,000 feet, were drilled in 1999, including 32,000 feet of infill definition drilling around the Liese zone, 7,000 feet of geotechnical drilling, and 4,000 feet of exploration drilling. As a result of the summer surface infill-drilling program, the geologic (indicated and inferred) resource for the Pogo project has been upgraded seven percent to 10.7 million tons at a grade of 0.524 ounces per ton, for a total of 5.6 million contained ounces.

Teck announced a new orebody, the "North Zone," approximately 800 feet northwest of the Liese zone. The North Zone, consisting of two north-trending, east-dipping

quartz veins, was discovered on surface and intersected in the planned shaft pilot hole. Other exploration drill footage targeted the southeast extension of the main Liese zone mineralization and the Sonora Creek prospect 5 miles southeast of the main deposit area. The Sonora Creek soil grid reportedly has higher gold anomalies than the original Liese soil anomaly.

Numerous companies staked land around the Pogo deposit in 1998, and though depressed gold prices hindered financing necessary to complete exploration programs, several 1999 programs identified interesting gold targets in the Goodpaster region. Avalon Development Corp. managed joint exploration programs for nine different companies in the Goodpaster district. Their work revealed that in some places in the Goodpaster area, 10 parts per billion gold might be a significant value to pursue with further geochemical sampling.

Western Keltic Mines Inc. struck a deal with Barrick Gold Corp. on five of Western Keltic's and Rimfire Minerals Corp.'s properties (California, Surf, Big Bend, Boogie, and Central Creek) in the Goodpaster district. Barrick has the option of earning a 51 percent interest in any of the five properties. Exploration in 1999 consisted of geologic mapping, prospecting, and geochemical sampling of soils and rocks on the Boundary prospect along the northern border of the California and Surf properties, on the southeastern part of the Surf property, and in the Beverly Creek area of the California property. Western Keltic collected over 3,400 soil, 375 rock, and 285 stream-sediment samples for geochemical analysis. This work resulted in the discovery of large multi-element soil geochemical anomalies and zones of gold-bearing quartz-veined boulders, with values of up to 0.72 ounces per ton of gold. The Boundary prospect has a 2,300-foot-long soil anomaly with gold values ranging from 10 to 40 parts per billion associated with anomalous arsenic, bismuth, tellurium, antimony, and tungsten. The southeast Surf soil anomaly extends over 2.7 miles in a northwest-southeast direction and contains gold values up to 70 parts per billion with associated anomalous arsenic, bismuth, antimony, and tungsten. The Beverly Creek area has anomalous gold values in stream-sediment samples with an undefined extent.

Hyder Gold Inc. optioned five properties from Rimfire Minerals Corp. in the Pogo area and completed a Phase I program of contour soil sampling, stream-sediment sampling, prospecting, and reconnaissance geological mapping. Coincident gold (up to 0.009 ounces per ton), arsenic, bismuth, and antimony anomalies outlined a 1.8-mile by 0.9-mile area on the Eagle property and quartz-veined float on the Bou property. A Phase II program of systematic grid-based

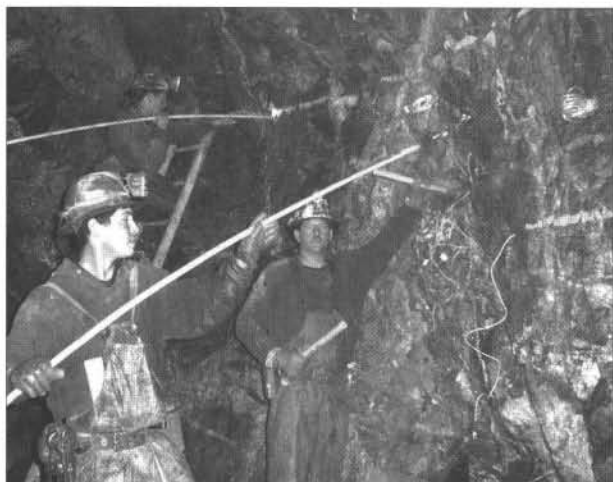


Figure 7. Day shift working on the face in the Pogo decline. Photo provided by Teck Resources Inc.

soil sampling, detailed geological mapping, and further prospecting on these properties identified gold mineralization (up to 0.17 ounces per ton of gold) related to quartz veinlets cutting Cretaceous granite. Elsewhere, Blackstone Resources terminated its option on Rimfire's Falcon property due to lack of financing.

Copper Ridge Explorations Inc. acquired five properties from KGE Management Ltd., which acquired the properties from Kinross Gold immediately after the closing of the Kinross-La Teko Resources merger. Alaskan properties include Discovery Gulch in the Circle mining district and Ogopogo in the Goodpaster mining district. Discovery Gulch had been under option to Camnor Resources Ltd. but Camnor terminated its option after a five-hole (1,520 foot) reverse-circulation drilling program in 1999 with the best intercept of 20 feet of 0.035 ounces per ton of gold in sericite-chlorite-carbonate-altered granodiorite with quartz veins containing up to 5 percent pyrite and 1 percent arsenopyrite. Copper Ridge conducted a soil auger sampling to test two significant gold-in-soil anomalies. Copper Ridge Explorations also acquired the right to earn 100 percent of the McKenzie claim block in the Circle district and conducted a reconnaissance sampling program.

Copper Ridge's Ogopogo project 1999 exploration program involved collecting 121 stream-sediment samples.

Gold values in stream sediments ranged up to 0.006 ounces per ton and coarse fraction samples returned gold values up to 0.047 ounces per ton. Other anomalous elements include arsenic, antimony, and tungsten. A subsequent soil geochemical survey collected 325 samples and identified three targets with gold values up to 0.008 ounces per ton and anomalous arsenic, bismuth, lead, antimony, and tellurium. Kinross Gold acquired the Northern Cross prospect from Copper Ridge Explorations. The Northern Cross prospect is 2 miles north of the Pogo deposit and is host to bismuth and tungsten pan concentrate anomalies from streams underlain by rocks similar to those which host the Pogo deposit.

Almaden Resources Corp. and partner Williams Creek Exploration Ltd. conducted stream-sediment, coarse-fraction sampling and prospecting programs on the Sonora property. Five drainages contained samples with values up to 40 parts per billion gold, with a background of less than 5 parts per billion gold.

Camnor Resources Ltd. and Oromin Exploration Ltd. conducted soil sampling, mapping, and prospecting on the 6-square-mile South Salcha project 25 miles northwest of the Pogo property. The work program consisted of 27 line-miles of soil sampling, geologic mapping, and rock sampling. Three linear, east-west-trending soil anomalies



Figure 8. Composite photo of the Liese 1½ vein, a newly discovered vein exposed in the Pogo decline that occurs between the Liese 1 and Liese 2 veins. Black bands in white quartz vein are mostly fine-grained sulfide minerals and some wallrock. Sample bag size is 11 inches by 17 inches. Photo provided by Teck Resources Inc.

defined by greater than 20 parts per billion gold occur at or near contacts between intrusive and gneissic rocks. The anomalies are 650 feet wide and vary from 2,600 to 4,600 feet long, with soil sample assays up to 140 parts per billion gold.

Valerie Gold Resources Ltd. entered into two option agreements to acquire an interest in the Octo property northwest of Pogo. Geologic mapping and geochemical surveys were completed, after which Valerie dropped its option.

Troymin Resources Ltd. collected over 400 stream-sediment and coarse-mineral-fraction samples from several creeks on five claim blocks southeast of Pogo. Gold values up to 0.015 ounces per ton, associated with anomalous bismuth, arsenic, molybdenum, and copper, were found at several areas.

NovaGold Resources Inc. identified three half-mile-scale drill targets on its 30-square-mile Caribou Creek project 25 miles northwest of the Pogo property. Each area contains highly anomalous gold, arsenic, antimony, and bismuth in surface rock chip and soil geochemical samples. Follow-up sampling on the No Grub Zone identified anomalous gold in soil values up to 0.03 ounces per ton of gold and rock chip samples with up to 0.11 ounces per ton of gold. Rock chip sampling in the newly identified Headwaters Zone returned values of up to 0.06 ounces per ton of gold. The northeast-trending Caribou Zone had values in rock chip samples up to 0.07 ounces per ton of gold. A detailed aeromagnetic and radiometric geophysical survey was flown over the Caribou Creek project area during the month of August. The 1999 Caribou Creek project exploration program was funded by Kennecott Exploration Co. as part of a joint-venture agreement with NovaGold, but Kennecott elected to discontinue funding after the 1999 season.

Ventures Resource Corp. and equity partner Teck Corp. completed 8,000 feet of diamond drilling in ten holes on the Carrie Creek portion of the Veta property in the

Goodpaster district. Extensive soil sampling augmented the drilling program at the Carrie Creek prospect. The best drill intercept was 23 feet of 0.03 ounces per ton of gold. The final two 1999 drill holes were relocated 2 miles south to test the newly discovered Serpentine zone. Drill core from the Serpentine zone contained altered, fractured, and veined rock. Results from the North Veta Area program (comprising the north-central segment of the Veta property) defined clusters of stream-sediment gold anomalies, with values ranging up to 0.029 ounces per ton gold, and highest panned concentrate values in the ounces per ton range. Sumitomo had a major program including drilling at the nearby Black Mountain prospect.

Ventures Resources also signed an exploration option agreement with Kennecott Exploration Co. on Ventures' 950-square-mile Champion property in the Fortymile mining district. Kennecott will focus its efforts on exploration for intrusive-related gold deposits. The agreement provided Kennecott the exclusive option to secure a joint venture with Ventures prior to October 31, 1999.

International Bravo Resource Corp. made a joint-venture agreement with Zeus Exploration, an affiliate of North Star Exploration Inc., for the East Divide, West Pogo, and Central gold prospects near Teck's Pogo property and Venture Resources' Veta property. Rock samples from an east-west trending, 1,000 foot by 4,000 foot quartz stockwork and sheeted zone hosted by intrusive rocks at the East Divide property assayed up to 0.19 ounces per ton gold, 1.1 percent copper and 3,860 parts per million bismuth. Visible sulfides within the quartz veins include pyrite, chalcopyrite, molybdenite, and bismuthinite. The West Pogo property has a wolframite-bismuthinite-scheelite vein prospect hosted by igneous rock and values up to 0.029 ounces per ton gold and 2,190 parts per million bismuth have been reported from samples collected there. Three other tungsten- and bismuth-bearing quartz

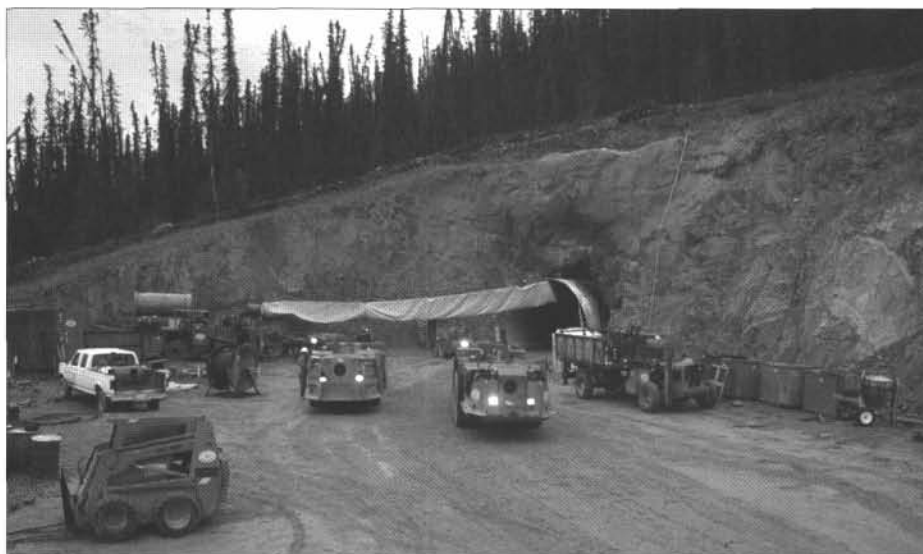


Figure 9. Early construction of Pogo decline and portal facilities. Photo provided by Teck Resources Inc.

veins occur near the schist-pluton contact on the West Pogo property. International Bravo also signed a letter of intent to acquire 51 percent interest in three other North Star Exploration properties known as the Highway Village Block properties. Bravo acquired an option from Hunter Exploration Group in ten property blocks in the Pogo and Fairbanks areas.

Blue Desert Mining Inc. conducted initial exploration programs on the Gobi-Portal and Mojave properties immediately southeast of the Pogo property. These properties cover 27,000 acres. Two areas with anomalous gold, tellurium, antimony, and bismuth values from stream-sediment samples were discovered and named the Sevenmile Creek and Portal areas. Blue Desert also worked on the Sahara property to the east of Pogo and collected a stream-sediment sample with 0.031 ounces per ton gold along with anomalous tellurium, antimony, and arsenic values. Blue Desert signed an agreement with AngloGold (U.S.A.) Inc. on the three properties in early 2000.

Fairfield Minerals Ltd. conducted a field program of geochemical sampling and prospecting on the Rock Creek and Shawnee properties northeast of Pogo. Stream-sediment and soil samples indicated weak but anomalous gold values ranging from 10 to 40 parts per billion in several areas. Other companies conducting initial exploration programs in the Goodpaster mining district include Snowfield Resources Ltd. on the Boulder Creek property, Camflo Resources Ltd. on the Gobi property, Newmont Alaska Ltd. on a property north of Pogo, and Achieva Development Corp. on the Shaw Creek property.

Golden Phoenix Alaska (Minerals Inc.) joined the flurry of claim staking in the emerging Uncle Sam area of the Richardson district southwest of the Pogo deposit. Other companies in the new staking fray were WGM Inc./Sumitomo, On-Line Exploration, and Anglo Alaska Gold.

Newmont Alaska Ltd. optioned the Gold Dust property in the Circle mining district from Great Quest Metals Ltd. Previous drilling on the property intercepted one zone containing 0.027 ounces per ton of gold over a width of 180 feet. Newmont confirmed previous work on the Alpine Zone and identified three new areas of anomalous gold values in soil samples. Newmont controls approximately 60 square miles of properties in the district.

Tri-Valley Corp. reached final agreement with Placer Dome Exploration Inc. on the 36-square-mile Buck and Buckeye portions of Tri-Valley's 51-square-mile Richardson project in the Richardson mining district. Placer Dome conducted a geologic mapping and geochemical survey using a broad-base soil auger sample grid. Several coincident gold, bismuth, tellurium, and tungsten anomalies were identified and three diamond drill holes were drilled in the area of one of the anomalies. Placer Dome notified Tri-Valley that it would proceed with the second year of exploration in 2000. Tri-Valley continued exploration

on the retained 14.5-square-mile portion of the claim block that includes the Democrat Dike lode prospect and on a promising high-grade placer prospect. Previous bulk sampling at the Democrat prospect yielded over 3,000 rough ounces of lode gold from 30,000 tons of partially crushed ore. Three Russian geologists from TsNIGRI continued evaluation of this mineralized dike system and identified a new gold-bearing zone. Ten square miles of 160-acre prospecting sites were staked to cover the trend. In the same area, Kennecott Exploration optioned ground from Golden Phoenix Minerals Inc. and conducted district-wide exploration.

Grayd Resource Corp. identified a significant gold-bearing zone on the Rumble Creek property west of Tok in the Delta mineral belt (fig. 10). Sampling of the White Gold trend outlined gold-bearing silicification zones up to 55 feet wide along the 5-mile trend. Gold values up to 1.79 ounces per ton, along with anomalous arsenic and antimony values, are associated with northeast-trending silicified structures with quartz-sericite and carbonate alteration envelopes and pyrite, arsenopyrite, and stibnite mineralization. Grayd also worked on the Dan-IC gold property in the Delta district. Grayd signed agreements late in the year to acquire 100 percent control of the Delta and Rumble Creek properties.

Grayd optioned its Dry Creek prospect in the Bonfield district south of Delta to Atna Resources Ltd. in June 1999. Atna funded a 14-hole, 10,260-foot diamond drill program. Twelve drill holes tested the DC North base metal, massive-sulfide mineralized horizon over a 13,500-foot strike length and two holes tested a large alteration zone underlying the DC North horizon. No exploration was carried



Figure 10. Era helicopter landing at American Copper & Nickel Co. (ACNC) drill site on south face of Tiger Mountain, Delta mineral belt. Meine Huser of Alaska Dreams Inc. (ADI) constructed helipad. Photo by Sam Dashevsky.

out in the WTF area or on the Anderson Mountain property. Drilling intersected an intense quartz-sericite-pyrite alteration zone 2,500 feet to the west of the Fosters zone along the DC North horizon. Drill hole DC99-65 intersected 5.5 feet of massive sulfide averaging 7.9 percent zinc, 4.0 percent lead, 3.74 ounces per ton silver, and 0.014 ounces per ton of gold. DC99-63, drilled in the Fosters zone down-dip of DC98-60, averaged 4.3 percent zinc, 2.0 percent lead, 2.07 ounces per ton silver and 0.014 ounces per ton of gold over 160 feet. DC99-64 intersected 10.5 feet grading 5.3 percent zinc, 1.8 percent lead, and 0.82 ounces per ton silver within a pyritic host rock with a true width of 100 feet. DC99-66 in the Discovery zone intersected 56 feet of 2.07 percent zinc, 0.77 percent lead, and 0.13 ounces per ton silver. Drilling results did not meet Atna's objective of defining a large deposit and Atna terminated its option with Grayd.

The 1999 exploration program at the Cirque property in the Bonnifield district by Camnor Resources Ltd. and Oromin Exploration Ltd. consisted of geologic mapping and reconnaissance diamond drilling. Four drill holes were completed on the Discovery zone and two holes were drilled on the Dol zone, for a total of 1,020 feet. The best volcanogenic-massive-sulfide mineralization intercepts were from hole 99-1 drilled on the Discovery zone, with 18 feet at 64 feet depth grading 0.08 ounces per ton of gold, 2.17 ounces per ton silver, and 11.55 percent combined zinc-lead-copper, and a second lens with a 6.6-foot width at 93.8 feet depth grading 0.027 ounces per ton of gold, 1.39 ounces per ton silver, and 11.49 percent combined zinc-lead-copper. The Discovery zone is interpreted to be a west-striking, moderately north-dipping zone plunging shallowly to the east. The Discovery zone has been traced for 2,300 feet along strike to the west and remains open along strike and down-dip to the north. Mineralization at the Dol zone is interpreted to represent mineralization distal to a vent source localized in dolomite.

North Star Exploration Inc. worked on the 89-million-year-old Elephant Mountain pluton near Rampart. Placer Dome Exploration Inc. discovered visible gold in altered granite outcrops at Elephant Mountain in 1991 and drilled several core holes containing anomalous gold in silicified, highly fractured granite. Placer Dome's soil sampling program outlined an open-ended 6,000-foot by 1,500-foot zone of anomalous gold and arsenic. Soil sampling by North Star in 1999 indicates that the anomalous zone continues for at least another 2,000 feet along the northeast-striking zone. Some of the soil anomalies coincide with high resistivity linears that are inferred to be surface expressions of fault/fracture zones in the pluton. North Star also explored the Step Mountain and nearby VABM Casca and Three Castle Mountain areas for Mississippi Valley type lead-zinc mineralization.

Cambior Exploration worked in the Livengood area. Cusac Gold Mines Ltd. signed an agreement to acquire an 80 percent working interest in the Moran Dome project, a 200-claim block covering 8,000 acres in the Melozitna mining district about 110 miles northwest of Fairbanks. The area contains historic placer mining locations, and stream-sediment sampling of local creeks outlines five anomalous regions with samples in excess of 0.30 ounces per ton gold.

Pacific Bay Minerals Ltd. acquired the TRIB property in the Ladue River area near the Canadian border. Limited lode exploration has identified anomalous gold values in quartzite and quartz breccias. Nearby, Achieva Development Corp. optioned a 50 percent interest in the Ladue claims to Luminex Ventures Inc. late in the year.

The State's Division of Geological & Geophysical Surveys awarded an airborne geophysical contract to Stevens Exploration Management Corp. and subcontractor, Geoterrex-Dighem, for about 950 square miles of the Salcha and Goodpaster mining districts. For the first time, the DGGs survey included radiometric data, which have proven useful for delineating rock types and alteration. Survey results will be released in early February 2000. DGGs conducted geological mapping and geochemical sampling in the area around Chicken as part of ground-truthing airborne geophysical surveys released earlier in the year. This work is part of a planned three-year study of the Fortymile mining district.

SOUTHCENTRAL REGION

Atna Resources Ltd. concluded a deal in early 1999 to earn 100 percent interest in the Caribou Dome Property. The Caribou Dome Property (previously known as the Denali Copper or Pass Creek prospect) is in southcentral Alaska, approximately 160 miles northeast of the city of Anchorage. The project site is several miles east of the former Valdez Creek placer mine. The Caribou Dome Property consists of 20 federal unpatented lode mining claims, ten millsite claims and 20 State of Alaska mining claims totaling approximately 1,258 acres. Previous work delineated 550,400 tons of mineralized material with an average grade of 5.84 percent copper within three of the nine known sulfide lenses. Atna conducted geochemical, geological, and geophysical surveys followed by a three-hole 2,442-foot diamond drill program to expand the potential size of the deposit. Geophysical surveys included induced polarization (IP), mise-a-la-masse, and ground magnetics. The IP survey defined two significant anomalies beyond previously known mineralization; a strong 700-foot-long chargeability high trending westward from the No. 2 Zone, and a second 600-foot-long anomaly south of and parallel to the eastern mineralized trend. Hand trenching extended the main mineralized trend 500 feet farther to the east. Chip samples from the new trench exposures assayed up to 6.7 percent copper over 2 feet.

Highlights of the 1999 Caribou Dome core drilling program are 5 feet of 5.9 percent copper from 1,059 to 1,064 feet (CD99-101) and one foot of 6.3 percent copper from 309 to 310 feet (CD99-102). Both drill intercepts were hosted in finely bedded pyrite and chalcopyrite within a calcareous argillite sequence. Results from the 1999 surface exploration and diamond drill program indicate good potential exists for expanding the areas of known mineralization of this prospective but complex property.

Usibelli Coal Mine Inc. was granted exploration permits for the Wishbone Hill property. The most coal that Usibelli can haul out of the area under the two-year exploration permit is 250 tons. Exploration trenches can be up to 30 feet wide and 250 feet long. Usibelli's permit allows 50 drill holes.

Shear Minerals Ltd. entered into a letter of intent with Shulin Lake Mining Inc. that allows Shear the right to earn a 50 percent interest in the Shulin Lake property. The property contains a large 2–3 mile diameter circular positive magnetic anomaly that is interpreted to be a high-level intrusive. Historic to recent placer gold is known in the region. Recent work by the property vendors indicates the presence of gold and diamond indicator minerals in the drainage surrounding the anomaly. Shear will investigate the property for kimberlitic/lamproitic intrusions, and base and precious metal potential.

Nevada Star Resource Corp. recently acquired approximately 8,000 acres of mining claims in the Nikolai nickel–platinum–copper belt in the southern Alaska Range. Between June 1996 and December 1998, Monty D. Moore and Associates and Nevada Star Resource Corp. of Seattle acquired mining rights to more than 81,600 acres and 8,580 acres of land, respectively, located on the southern flank of the Alaska Range. M.A.N. Resources Inc. will conduct exploration for platinum-group-element mineralization under a lease agreement with Nevada Star over a total of 2,212 mining claims. The Eureka Creek Project area is approximately 100 miles south-southeast of Fairbanks, and 156 miles northeast of Anchorage. Previous work identified platinum-group-element enriched sulfide concentrations in net textures at the base of the Tangle Lake and Landmark Gap ultramafic complex rocks and as disseminated nickel–copper sulfide mineralization in exposures along Broxson Gulch, Rainy Creek, Eureka Creek, and northern portions of the claim block. Meridian Geoscience Ltd. under contract with M.A.N. Resources, conducted a helicopter-borne magnetic–EM (electromagnetic) survey over the Eureka Creek and Tangle Lakes areas between June 12 and July 16, 1999 (fig. 11). A total of 1,984 line-miles were flown. Traverse flight line spacing was 328 feet (100 m) in the Tangle Lakes areas and 656 feet (200 m) in the Eureka Creek area. A number of promising electromagnetic conductors were discovered, particularly in the poorly exposed Tangle Lakes area. Geologic mapping included regional

and detailed mapping to ascertain the distribution, orientation, and structural setting of important host lithologies. Ground geophysical surveys are planned to test the identified targets.

Fort Knox Gold Resources Inc. entered into an agreement with Inco Ltd. and American Copper & Nickel Co. Inc. to increase its ownership from 20 to 100 percent in the Nikolai platinum–palladium–nickel property. Mineralization occurs in layered ultramafic–mafic intrusions and is hosted primarily by gabbro/norite, clinopyroxenite, and serpentized dunite/wehrlite units. Mineralization varies from weakly disseminated to net-textured sulfides in ultramafic rocks and disseminated to massive sulfides in gabbro/norite. The predominant sulfide phases are pyrrhotite, pentlandite and chalcopyrite. Platinum and palladium values are elevated in weakly mineralized intrusive rocks and reach as high as 0.45 ounces per ton platinum and 0.08 ounces per ton palladium in grab samples of massive sulfides. Core drilling near the Cantwell prospect intersected 17 feet of 3–5 percent sulfides with assay values of 0.020 ounces per ton platinum, 0.026 ounces per ton palladium, 0.8 percent nickel, and 0.5 percent copper.



Figure 11. *Era* helicopter performing an airborne geophysical survey in the Tangle Lakes area, Alaska Range, for M.A.N. Resources Inc. M.A.N. Resources is currently exploring the area for platinum-group-element mineralization associated with ultramafic to mafic intrusions. Photo provided by Lea Ann McDonald, *Era Helicopters*.

Fort Knox Gold also exercised an option to acquire 100 percent interest in the Gunsight property, approximately 90 miles north of Anchorage in the Talkeetna Mountains. Potential copper–gold porphyry mineralization will be tested by an IP geophysical survey in the Prescott Point area.

SOUTHWESTERN REGION

Placer Dome Exploration Inc. cut back its exploration staff and continued evaluation of its 11.5-million-ounce gold resource at Donlin Creek near Flat with one core-drilling rig. Placer Dome confirmed the grade of the deposit. Placer Dome also conducted a small exploration program on Calista's Stuyahok prospect. Unfortunately, Placer Dome closed its Anchorage office during 1999, but continued exploring in southwestern Alaska and the Richardson district in the eastern interior region. A pre-feasibility study at Donlin Creek was postponed due to dismal gold prices.

Two companies new to Alaska also optioned land in the area. Fjordland Resources Ltd. optioned the Kisa prospect from Cominco Inc. The Kisa prospect is believed to be similar to NovaGold Resources' 1-million-ounce Shotgun gold deposit. Poseidon Minerals Ltd. acquired lease rights to earn a 100 percent interest in the Ganes Creek and Colorado Creek properties, formerly under option to Placer Dome. Ganes Creek occupies a large regional north-east-trending structure and the best placer gold on the property appears to occur at the intersections of related west-northwest and west-southwest structures. Over 260,000 ounces of placer gold has been produced from the Ganes Creek drainage, with much of the gold coarse, angular, and associated with quartz gangue. The Colorado Creek area has produced over 50,000 ounces of placer gold and the creek occupies a large, linear, north-northwest drainage interpreted as a deep-rooted regional structure. Poseidon conducted a mobile metal ion soil geochemical survey on both properties.

SOUTHEASTERN REGION

Kennecott Exploration continued exploration in and around the Greens Creek Mine. Abacus Minerals continued to assess the Niblack Mine near Ketchikan, and received a \$2.5 million long-term, non-convertible, low-interest loan from the Economic and Development Assistance Fund in Ketchikan, Alaska. The funds are planned for further exploration and development at Niblack. A large group of claims was staked in the Wrangell Narrows area near Petersburg following an airborne geophysical survey sponsored by the State of Alaska, the federal government, several local communities, and Sealaska Corp.

Rubicon Minerals succeeded in outlining massive-sulfide mineralization with a ten-hole, 6,153-foot diamond core drilling and mapping program at its Palmer prospect near Haines. A new massive sulfide showing named the RW zone is 600 feet from the Lower Jarvis zone and 1,600 feet from the Upper Main zone along the same stratigraphic horizon. The RW zone was extended by drilling to 680 feet up-dip on sections 170 feet apart, with mineralization open in all directions. Drill results include 8.3 feet grading 5.85 percent zinc, 1.89 percent copper and 1 ounce per ton silver. Two holes drilled to test the MHC prospect did not intersect significant mineralization. The Cap showing was not tested in the 1999 program, but remains a target for future drilling. Another new high-grade surface-mineralized zone was discovered 150 feet above and in the stratigraphic hanging wall to the Main zone mineralization. Two grab samples assayed up to 18.75 percent zinc, 0.28 percent copper, and 0.56 ounces per ton silver.

Santoy Resources Ltd. signed an agreement with Stealth Ventures Ltd. to acquire 100 percent interest in the Salt Chuck copper–palladium–gold–silver deposit on Prince of Wales Island. First-year work commitments were minimal under the deal. Santoy compiled previous work data to better define a future exploration program.

DEVELOPMENT

Development expenditures dropped again in 1999 to \$33.8 million from \$55.4 million in 1998, though plans at several operations call for increased development in 2000. Table 7 shows the regional employment and development investment, and table 8 compares the 1999 expenditures with those of the prior 17 years. Figure 12 shows the locations of selected development projects. No development projects were reported in the southwestern or Alaska Peninsula regions in 1999.

NORTHERN REGION

Most of the development in this region was related to Cominco Alaska's Red Dog zinc–lead–silver mine and the

associated port, storage, and loading facility about 52 road-miles to the west. At the mine, preparations were being made to optimize the milling operation in the next few years by modifying the flotation circuit. At the port, drainage lines were installed, and a new 3,500-foot conveyor was installed between the storage area and surge bins.

Minor amounts of development, such as stripping frozen overburden, were reported for some of the northern region placer mines.

WESTERN REGION

Viceroy Resources conducted a 2,400-foot, 23-hole drill program at the Illinois Creek gold–silver mine during a

Table 7. Reported mineral development expenditures and employment in Alaska by commodity and region, 1999

	Northern	Western	Eastern interior	South-central	South-eastern	Total
Development expenditures						
Base metals	\$12,500,000	\$ --	\$ --	\$ --	\$ --	\$12,500,000
Polymetallic	--	--	--	--	2,500,000	2,500,000
Precious metals						
Placer	100,000	--	144,000	20,000	--	264,000
Lode	--	100,000	6,700,000	--	8,800,000	15,600,000
Coal and peat	--	--	2,575,000	--	--	2,575,000
Industrial minerals	100,000	--	90,000	110,000	100,000	400,000
TOTAL	\$12,700,000	\$100,000	\$9,509,000	\$130,000	\$11,400,000	\$33,839,000
Development employment						
Employment						
Workdays	14,570	970	8,756	670	10,220	35,186
Workyears ^a	56	4	34	2	39	135
Number of companies reporting ^b	3	2	11	4	4	24

-- No expenditures reported.

^aBased on 260-day workyear.^bSome companies active in more than one area.

No development expenditures or employment reported for southwestern and Alaska Peninsula regions in 1999.

Table 8. Reported mineral development expenditures in Alaska by commodity, 1982–99

	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
TOTAL	\$634,181,300	\$242,633,136	\$677,101,330	\$23,282,500	\$55,900,000	\$1,633,098,266

N/A = Figures not available prior to 1986.

-- Not reported.

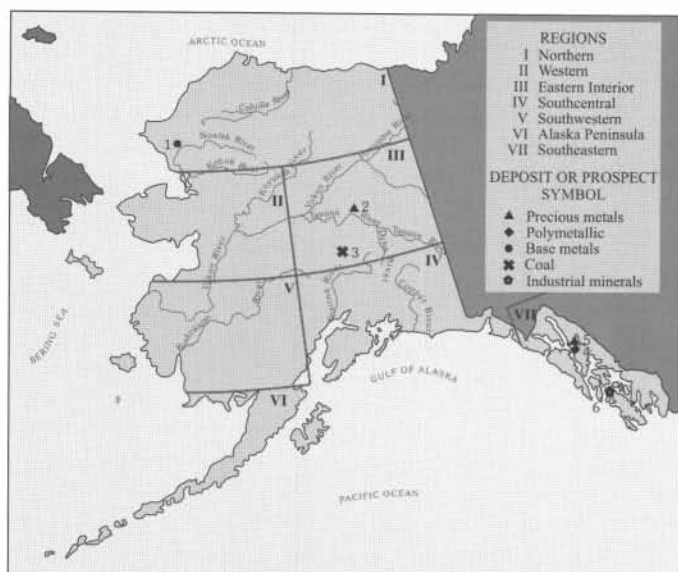


Figure 12. Selected mineral development projects in Alaska, 1999.

due-diligence development program while the mine was on care-and-maintenance status, but no other development projects were reported.

EASTERN INTERIOR REGION

Most of the development was associated with activity at Fairbanks Gold Mining Inc.'s (FGMI) Fort Knox, True North, and Ryan Lode mines. FGMI is a wholly-owned subsidiary of Kinross Gold Corporation.

Activity at Fort Knox Mine consisted of 2,500 feet of reverse-circulation (RVC) drilling and 5,768 feet of core drilling for development in the pit; construction associated with dewatering of the pit; and random waste storage. At the recently acquired True North property development drilling included 18,695 feet of RVC drilling and 5,064 feet of core drilling for confirmation of reserves (7.242 million tons of 0.063 ounce per ton ore containing 459,000 ounces of gold) and for baseline hydrology data. Plans are to invest about 30 million dollars to rebuild the access road, and mine the Hindenberg Pit and East Pit at 30,000 tons per day as "gravel pits," trucking about 10,000 tons of ore daily to the Fort Knox mill to blend with about 30,000 tons of Fort Knox ore.

At Ryan Lode west of Fairbanks about 8,000 feet of RVC drilling and 5,957 feet of core drilling were completed for hydrologic and baseline studies, and to better understand the oxide/sulfide boundary of the deposit. The

drilling was also conducted to better define and confirm a previously stated geologic resource totaling 2.4 million ounces, with a defined reserve of 820,000 ounces of gold in 14.6 million tons of rock. Kinross has also voluntarily begun \$100,000 worth of site remediation at Ryan Lode to address perceived environmental problems that occurred prior to their acquisition of the property. Current reserves are 2.4 million tons grading 0.089 ounces of gold per ton, for a contained 214,000 ounces. Further drilling and permitting will continue in 2000 to examine the feasibility of trucking ore from Ryan Lode to the mill at Fort Knox.

Eight placer mines reported minor development work such as stripping frozen overburden and drilling, and several gravel pits and peat operations reported some development.

At the Usibelli Coal Mine near Healy, preparations are being made to move the 2,000-ton Ace-In-The-Hole dragline from the Poker Flats Pit, where it has operated to remove overburden for the last few years, to a new mining lease across the river at Two Bull Ridge. Road construction to access the lease cut several coal seams, and the sale of the coal served to offset the development expenses.

SOUTHCENTRAL REGION

The only development reported in this region was minor stripping at two placer mines, and development of a gravel pit near Anchorage.

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. Two Bull Ridge operation—Usibelli Coal Mine Inc. (drilling, road construction)

IV Southcentral Region

V Southwestern Region

VI Alaska Peninsula Region

VII Southeastern Region

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

SOUTHEASTERN REGION

Coeur-Alaska Inc. continued to study the optimization of the Kensington Mine 45 miles north of Juneau, and to apply for permit modifications to take into account the changing plans for the operation.

Kvaerner Environmental continued with reclamation and rehabilitation of the historic Alaska-Juneau (A-J) Mine

in downtown Juneau, and anticipates completion of the main tasks in 2000. Kvaerner is also conducting a comprehensive risk-based assessment at the mine and will establish a fund for long-term environmental monitoring.

Kennecott/Hecla reported about 5,000 feet of development drifting and underground drilling at their Greens Creek Mine.

PRODUCTION

The total value of production from Alaska's mines and quarries in 1999 was \$1,032.9 million, up 12 percent from the \$920.2 million documented in 1998. Most of the increase was due to a full year of mining at the higher rate allowed by the Production Rate Increase project at Red Dog Mine. The Red Dog zinc-lead-silver mine and the Greens Creek polymetallic mine both produced record amounts of concentrates in 1999, more than compensating for low metal prices, the decline in the amount of gold produced, and the low gold price.

For the first time in many years there was no production from the major placer deposits in Nome, and many long-time placer miners opted to sit out the year due to the extremely low gold prices. The Nixon Fork underground gold mine was put on care-and-maintenance status in June, and the Illinois Creek open-pit mine continued to rinse the existing heaps, with no additional placement of new ore.

Table 9 shows the quantity and value of metals and materials produced from 1997 to 1999. Table 10 lists the mines and miners that completed an Alaska Placer Mining

Table 9. *Estimated mineral production in Alaska, 1997–99^a*

	Quantity			Estimated values ^b		
Metals	1997	1998	1999	1997	1998	1999
Gold (ounces)	590,516	594,191	517,890 ^c	\$207,287,000	\$174,621,000	\$144,262,000
Silver (ounces)	14,401,165	14,856,000	16,467,000	70,710,000	82,154,000	85,628,000
Copper (tons)	1,720	1,900	2,100	3,543,000	2,850,000	2,982,000
Lead (tons)	88,560	102,887	125,208	49,593,000	49,386,000	57,596,000
Zinc (tons)	419,097	549,348	643,642	494,888,000	505,400,000	630,769,000
Subtotal				\$826,021,000	\$814,411,000	\$921,237,000
Industrial minerals						
Jade and soapstone (tons)	2.0	2.0	2.0	\$ 25,000	\$ 25,000	\$ 25,000
Sand and gravel (million tons)	13.8	12.40	10.6	51,913,000	57,280,000	52,418,000
Rock (million tons)	3.2	1.64	2.34	20,000,000	14,041,000	18,010,000
Subtotal				\$ 71,938,000	\$ 71,346,000	\$ 70,453,000
Energy minerals						
Coal (tons)	1,446,000	1,339,000	1,560,000	\$ 38,048,000	\$ 35,233,000	\$ 41,048,000
Peat (cubic yards)	38,500	38,000	38,000	192,000	190,000	165,000
Subtotal				\$ 38,240,000	\$ 35,423,000	\$ 41,213,000
TOTAL				\$936,199,000	\$921,180,000	\$1,032,903,000

^aProduction data from DGGS questionnaires, phone interviews with mine and quarry operators, Alaska Department of Transportation and Public Facilities, and federal land management agencies.

^bValues for selected metal production based on average prices for each year; for 1999—gold (\$278.70/ounce) unless other value provided by operator; silver (\$5.20/ounce); copper (\$0.71/lb); zinc (\$0.49/lb); lead (\$0.23/lb). All other values provided by mine operators. Values rounded to nearest \$1,000.

^cHardrock gold 447,662 ounces, placer 70,228 ounces.

Table 10. Companies and individuals reported to be producing metal in Alaska, 1999

Operator	Creek	District	Type ^a
NORTHERN REGION			
Gold Dust Mines	Big	Chandalar	O/P Placer
Lounsbury, Jim	Union Gulch	Koyukuk	O/P Placer
Paradise Mining	Birch	Koyukuk	O/P Placer
Tri-Con Mining	Nolan	Koyukuk	O/P and U/G Placer
Cominco Alaska Inc.	Red Dog Mine	Noatak	HR O/P (zinc-lead-silver)
WESTERN REGION			
Vial, Dave	Candle	Fairhaven	O/P Placer
Vial, Mike	Candle	Fairhaven	O/P Placer
Taiga Mining	Dry	Hughes	O/P Placer
Rosander, Ron	Colorado	Innoko	O/P Placer
Dakota Mining Corp.	Illinois Creek Mine	Kaiyuh	HR O/P (gold-silver)
Benesch, George	Coffee	Kougarok	O/P Placer
Mullikin, Donald	Noxapaga	Kougarok	O/P Placer
Magnuson, Manzie	Candle	McGrath	O/P Placer
Real del Monte Mining Corp.	Nixon Fork Mine	McGrath	HR U/G (gold-copper)
Gibson, Wayne	Golden	Melotzitna	O/P Placer
High Bench	Anvil	Nome	O/P Placer
Krutzsch, Betty	Specimen Gulch	Nome	O/P Placer
Massie, Perry	Cripple	Nome	O/P Placer
Olsen, Dave	Canyon	Nome	O/P Placer
Pettigrew	Anvil	Nome	O/P Placer
Pomrenke, Steve	Tripple	Nome	O/P Placer
Walsh, Paul	Gold Run	Nome	O/P Placer
Kralik, Janos	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
Catt, Bruce	Crooked	Circle	O/P Placer
Fulton, Gordon	Switch	Circle	O/P Placer
Glassburn, Don	Gold Dust	Circle	O/P Placer
Koppenberg, Sam	Sourdough	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
The Mining Co.	Ketchum	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

^aO/P=Open-pit; HR=Hard-rock; U/G=Underground.

Operator	Creek	District	Type ^a
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
Tweiten, Oscar	Chatham	Fairbanks	O/P Placer
Yellow Eagle	Cripple	Fairbanks	O/P Placer
45-Pup Mining	Fortymile	Fortymile	O/P Placer
Bickell, Harvey	Walker Fork	Fortymile	O/P Placer
Carr, Brad	Chicken	Fortymile	O/P Placer
GeoQuest	Chicken	Fortymile	O/P Placer
Hayden, Forest	Kal	Fortymile	O/P Placer
Maxwell Mining	Kal	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
Tallini, Roger	South Fork	Fortymile	O/P Placer
Taylor's Mining	Fortymile	Fortymile	O/P Placer
Treesh, James	Cherry/No Name	Fortymile	O/P Placer
Cassiterite Placers	Tofty	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
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
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			
Kennecott/Hecla	Greens Creek Mine	Admiralty Island	U/G (zinc-lead-silver-gold)

^aO/P=Open-pit; HR=Hard-rock; U/G=Underground.

Application for the 1999 season, and were thought to have had at least some production. Figures 13, 14, and 15 show historic production of sand and gravel, gold, and coal. Selected 1999 Alaskan production sites are shown in figure 16.

Metals, with a value of \$921.2 million, account for 89 percent of the total production, followed by industrial minerals (rock, sand and gravel) with a value of \$70.5 million (7 percent), and coal and peat at \$41.2 million (4 percent).

As in the last few years (and for the foreseeable future) zinc was the most valuable metal produced in Alaska in 1999. The 643,642 dry short tons produced had a gross value of \$630.77 million, or 68 percent of the total \$921.1 million metal value. Gold, at 517,890 ounces with a value of \$144.3 million or 16 percent ranked second, followed by silver (16.47 million ounces with a value of \$85.63 million, 9 percent), 125,208 tons of lead (\$57.6 million and 6 percent), and 2,100 tons of copper (\$3 million and 0.3 percent).

Table 11 shows the average value of the metal prices used in this report over the last 7 years. The average price for most of the metals produced in Alaska, with the exception of zinc, has declined in the last three years.

These production estimates are from 187 questionnaires returned from miners, Native corporations and municipalities, supplemented by about 90 phone surveys. Additional information was derived from Alaska Placer Mining Applications (APMAs) submitted to the Division of Mining, Land & Water, but a number of 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 wish to thank the Alaska Railroad Corporation (ARR), the Alaska Department of Natural Resources Division of Mining, Land &

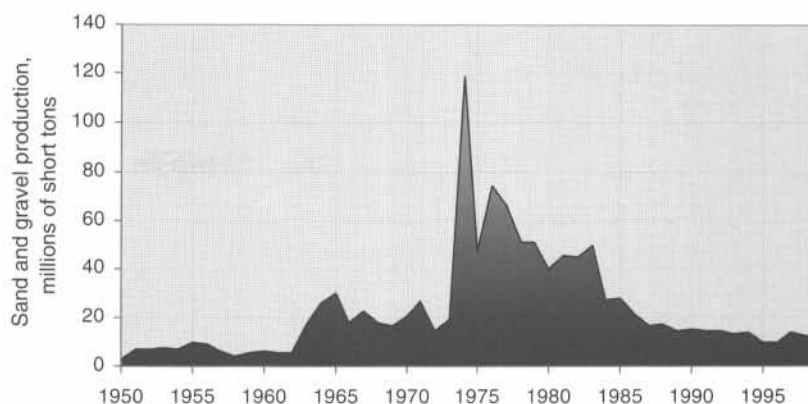


Figure 13. Sand and gravel production in Alaska, 1950–99.

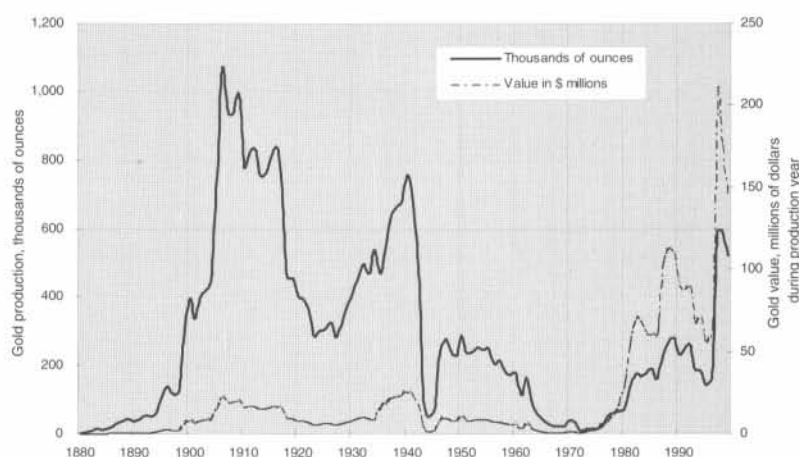


Figure 14. Amount and value of gold production in Alaska, 1880–1999.

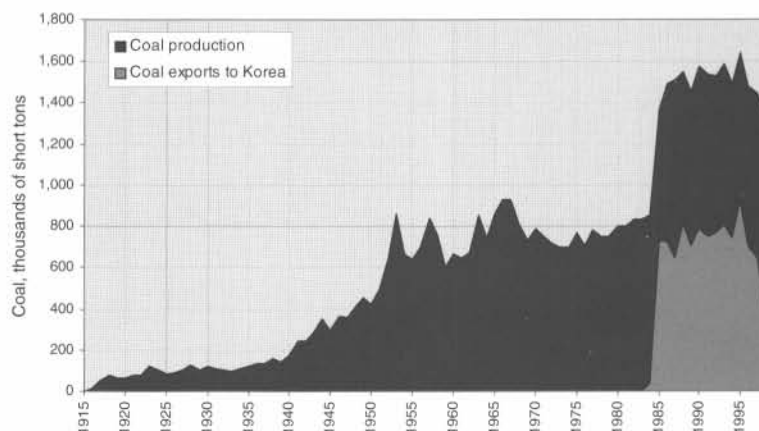


Figure 15. Coal production in Alaska, 1915–99, including exports to Korea.

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

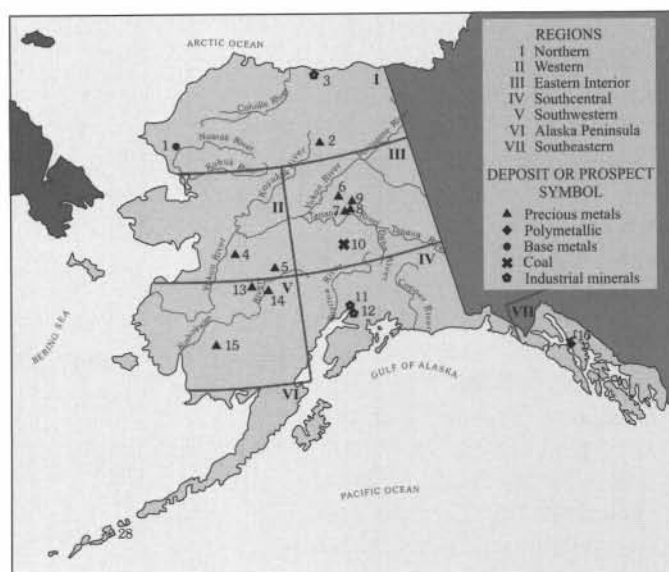
4. Dakota Mining Co. Illinois Creek Mine, Koyukuk–Hughes district—gold–silver
5. Real del Monte Mining Corp., Nixon Fork Mine McGrath–McKinley district—gold–copper–silver–bismuth

III Eastern Interior Region

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

IV Southcentral Region

11. Landscape Supply Corp., Hatcher Pass district—topsoil–peat
12. Hermon Brothers Construction Co., Anchorage district—sand and gravel

**V Southwestern Region**

13. Clark–Wiltz Partnership, Innoko district—gold–silver
14. Manzie Magnuson, McGrath–McKinley district—gold–silver
15. NYAC Mining Co., Nycac district—gold–silver

VI Alaska Peninsula Region**VII Southeastern Region**

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

Figure 16. *Selected production projects, 1999.*

Water (DMLW), the Department of Transportation & Public Facilities (DOTPF), the U.S. Bureau of Land Management (BLM), and the U.S. Forest Service (USFS) for providing information for this section of the report.

Some respondents reported costs and unit values, but unless selling costs were expressly provided, the 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 by small, medium, and large mines. Hardrock gold production declined from 498,892 ounces in 1998 to 447,662 ounces in 1999, while placer gold production declined to 70,228 ounces from 95,299 ounces a year earlier. The closure of the large Alaska Gold Company mine at Nome accounted for much of the placer decline, and the closures of Illinois Creek Mine and Nixon Fork Mine accounted for the decline in hardrock production.

Tables 14 and 15 show the value and regional importance of sand and gravel and rock production. The amount of sand and gravel used in the state is highly influenced by

Table 11. *Average metal prices, 1993–99*

	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

the amount of road construction, and also by activity in the North Slope oilfields. In 1999 most of the 10.6 million tons was used in road construction, and had a computed value of \$52.4 million. Likewise crushed rock and riprap use has declined substantially as U.S. Forest Service needs have declined. Only 2.3 million tons of rock, with a computed value of \$18 million, was used throughout the state in 1999, a slight increase over the previous year, but down dramatically from the average of 13 million tons used in the mid 1990s.

Coal production increased slightly in 1999 to 1,560,000 short tons, and though shipments for export to Korea, 563,000 short tons, were not as high as expected, they exceeded the 409,000 short tons shipped in 1998. Peat production remained at about the same level as in past years.

NORTHERN REGION

METALS

Cominco's Red Dog Mine produced 574,111 tons of zinc, 97,756 tons of lead, and an estimated 6 million ounces of silver in 1999, accounting for almost 70 percent of all metal produced in Alaska. When exploration and development are included, the Red Dog Mine area accounts for a full 59 percent of the total value of Alaska's mineral industry.

Red Dog Mine is located in the Main Zone, one of at least five deposits known in the Red Dog mining district

(see the "Exploration" section). In 1999 about 3.283 million tons of ore was milled, with an average grade of 21.3 percent zinc, 5.2 percent lead, with 2.7 ounces of silver per ton. The average zinc and lead contents of the concentrates were 55.2 percent and 58.5 percent respectively. Table 16 shows details of production for the past 11 years.

The Red Dog operation (fig. 17) employs 539 people, with an additional 60 at the port site during the short summer shipping season. Cominco employs 419 people in the mining and milling process, of whom about 60 percent are local corporation shareholders. NANA, the local regional Native corporation, has the contract for housekeeping and services in a NANA-Marriott joint venture, and at year-end entered into the NANA-Lynden joint venture to transport the ore concentrates to the port, 52 miles away on the Chukchi Sea coast south of Kivalina. NANA-Marriott has 49 employees, and NANA-Lynden has 59.

Table 12. Reported refined gold production, number of operators, and industry employment in Alaska, 1997–99^a

Region	Number of operators			Production in ounces of gold			Number of employees		
	1997	1998	1999	1997	1998	1999	1997	1998	1999
Northern	4	4	5	537	731	1,262	12	9	8
Western	24	24	21	104,297	113,066	36,377	324	254	114
Eastern Interior	75	72	57	423,676	413,959	392,237	548	475	443
Southcentral	6	9	8	971	543	305	12	15	14
Southwestern	11	7	8	5,070	5,320	7,577	57	27	28
Southeastern	3	1	2	55,965	60,572	80,132	277	275	280
TOTAL	123	117	101	590,516	594,191	517,890	1,230	1,055	887

^a1999 production includes 447,662 ounces gold from Nixon Fork, Illinois Creek, Fort Knox, and Greens Creek hardrock projects, and 70,228 ounces of placer gold.

Table 13. Production for selected Alaska placer gold mines, 1993–99

Mine size	1993	1994	1995	1996	1997	1998	1999
Number of mines							
Small ^a	19	24	11	9	25	45	38
Medium ^b	4	6	5	5	6	11	13
Large ^c	2	4	4	4	4	7	7
TOTAL	25	34	20	18	35	63	58
Production in ounces							
Small ^a	3,919	2,789	1,459	1,433	5,077	10,159	4,710
Medium ^b	5,825	7,471	5,890	5,058	9,373	12,833	13,218
Large ^c	25,335	48,864	43,390	49,240	65,682	72,307	52,300
TOTAL	35,079	59,124	50,739	55,731	80,132	95,299	70,228

^a<650 oz gold/yr.

^b650–2,500 oz gold/yr.

^c>2,500 oz gold/yr.

NOTE: Mine cost estimates are discontinued due to lack of information.

Except for those employees housed at the port site, most are accommodated at "The Doghouse" at the mine.

The mine is a conventional open pit operation, with a jaw crusher and a gyratory crusher at the pit exit. These crushers feed the minus-six-inch coarse ore stockpile, which is trucked to 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 long 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.

Power for the mine is presently provided by diesel generators, but the federal Environmental Protection Agency is attempting to restrict the use of additional power units. Cominco is investigating the use of natural gas derived from the shale basins that contain the ore, and is also looking at the possibility of mine-mouth power from the high-rank coals of the Northwest Arctic coalfields about 60 miles north of the mine. The Arctic Slope Regional Corporation owns some of the coal and has been exploring the export potential 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 opening the Northwest Arctic coalfields.

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 concentrates into 35,000- to 88,000-ton ships. At present two Foss Maritime barges with on-deck Caterpillar 988 loaders are

Table 14. Reported sand and gravel production and industry employment in Alaska by region, 1999

Region	Companies and agencies reporting ^a	Tons	Estimated unit value (\$/ton) ^b	Total value	Estimated number of employees
Northern	4	1,728,911	4.72	8,159,062	107
Western	3	718,055	5.36	3,845,823	33
Eastern Interior	5	2,663,140	4.78	12,741,308	181
Southcentral	11	5,136,434	4.82	24,764,903	237
Southwestern	4	125,896	12.28	1,546,249	17
Alaska Peninsula	0	0	0	0	0
Southeastern	2	229,300	5.93	1,360,201	15
TOTAL	29	10,601,736	\$4.94	\$52,417,546	590

^aFrom 22 returned questionnaires and 12 phone canvass responses.

^bValues are based on price and cost estimates from 16 producers.

Table 15. Reported rock production and industry employment in Alaska by region, 1999^a

Region	Companies and agencies reporting ^b	Tons	Estimated unit value (\$/ton) ^c	Total value	Estimated number of employees
Northern	1	60,000	8.00	\$ 480,000	6
Western	2	6,000	10.00	60,000	10
Eastern Interior	3	112,000	9.00	1,008,000	22
Southcentral	3	440,000	7.60	3,344,000	53
Southwestern	0	--	--	--	--
Alaska Peninsula	0	--	--	--	--
Southeastern	3	1,717,000	7.64	13,117,880	37
TOTAL	12	2,335,000	\$7.71	\$18,009,880	128

^aIncludes shot rock, crushed stone, D-1, riprap, and modest quantities of ornamental stone.

^bDerived from 8 questionnaires, 10 phone canvass responses.

^cUnit value based on data supplied by 7 operations. Unit values for different stone products vary widely.

-- Not reported.

Table 16. Red Dog Mine production statistics, 1989–99^a

	Tons Milled	Ore Grade			Total Tons Concentrate Produced ^c	Contained Tons Zinc	Contained Tons Lead	Million Ounces Silver ^b	Employees
		Zinc %	Lead %	Silver oz/ton					
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 ^d

^aRevised slightly from Bundtzen and others (1996) based on new company data.

-- = No data.

^bEstimate based on grade and tonnage.

^cTotals for years 1990 through 1995 include bulk concentrate.

^dIncludes support personnel and 419 mine-mill personnel.

SOURCE: Gary Coulter and Jim Kulas, Cominco Alaska Inc.



Figure 17. Aerial view of the Main Deposit pit and support facilities at Red Dog Mine. Photo from Cominco webpages (<http://www.cominco.com/operations/reddog.htm>).

attended by three tugs to lighter the concentrates from the dock, where the water depth is only about 20 feet, to the ships. The possibility of dredging a channel to the dock, and expanding the shiploading capacity of the dock is being investigated.

Placer mines in the Northern region produced only 1,262 ounces in 1999, mainly from the Wiseman and Chandalar Lake areas.

INDUSTRIAL MINERALS

About 60,000 tons of rock were used at the Red Dog Mine, but the majority of the sand and gravel, 1.73 million tons, was used at the North Slope oilfields, and for construction projects at the towns in the North Slope Borough.

WESTERN REGION METALS

The underground Nixon Fork gold–copper mine owned by the Real del Monte Mining Corp. was put on care-and-maintenance status on June 4, 1999, but produced about 9,900 ounces of gold and 700 tons of copper prior to closure and during heap rinsing operations throughout the year.

Dakota Mining Corp.'s Illinois Creek gold–silver mine was another casualty of the plummeting gold price, and in 1999 only 6,600 ounces of gold and 62,000 ounces of silver were produced as a result of the rinsing of the ore already on the heap. No new ore was added, but late in the year Vice-roy Resources, operator of the Brewery Creek mine in Yukon Territory, opted to examine Illinois Creek for possible future mining. For part of the year the mine was under the stewardship of the State of Alaska Division of Mining, Land & Water.

About 19 placer mines operated in the Western Region in 1999, producing almost 20,000 ounces of fine gold. Most are small- to medium-sized, though NovaGold Resources Inc. has indicated an interest in resuming mining at the Nome placers, which produced about 25,000 ounces per year for many

years prior to the 1998 closure.

INDUSTRIAL MINERALS

There was only minor production of rock from the Sound Quarry at Cape Nome in 1999, but about 718,000 tons of sand and gravel were used for a variety of construction projects throughout the region, mainly on the Seward Peninsula (fig. 18).

EASTERN INTERIOR REGION

METALS

The major mine in the eastern interior region is Fort Knox Gold Mine operated by Fairbanks Gold Mining Inc. for its parent company Kinross Gold Corp. From 30.4 million tons mined, 13.8 million tons were milled in 1999 to produce 351,120 ounces of gold; 4.1 million tons were stored at the stockpile. Gold production from Fort Knox is given in table 17. The mine is a conventional open-pit mine using 23-cubic-yard shovels to load 150-ton trucks for the trip to the in-pit crusher. Crushed ore is conveyed to a storage pile from where it is conveyed to a mill circuit consisting of SAG mills operating in closed circuit with two ball mills and a bank of cyclones (figs. 19, 20). Some raw gold is recovered in various gravity traps, but the bulk is extracted in a cyanide circuit. Gold recovery is approximately 90 percent.

A 1999 report commissioned by the Fairbanks North Star Borough showed that Fort Knox Mine creates 260 direct, and 312 indirect, jobs in Fairbanks. The company spends over \$35 million annually on local goods and services, has an annual \$107 million impact on the local economy, and pays the borough \$4.4 annually in real estate taxes and other revenue.

About 56 placer gold mines operated in the eastern interior in 1999, and they produced about 41,123 ounces of gold. All but three would be considered small- to medium-sized, and table 12 shows the distribution by mining district. Many long-time miners are taking a wait-and-see approach to the historic low gold prices that prevailed through much of 1999, and several have elected not to mine in 2000.

COAL

Usibelli Coal Mine at Healy produced 1,560,000 short tons in 1999, mainly from the Poker Flats pit that has been the mainstay of production for many years. Some coal was gleaned from the road cuts that are being prepared to access the Two Bull Ridge lease on the east side of the river

Figure 18. Loading rock from the Cape Nome quarry onto a barge bound for Dillingham. Photo provided by Tom Sparks, Bering Straits Native Corp.

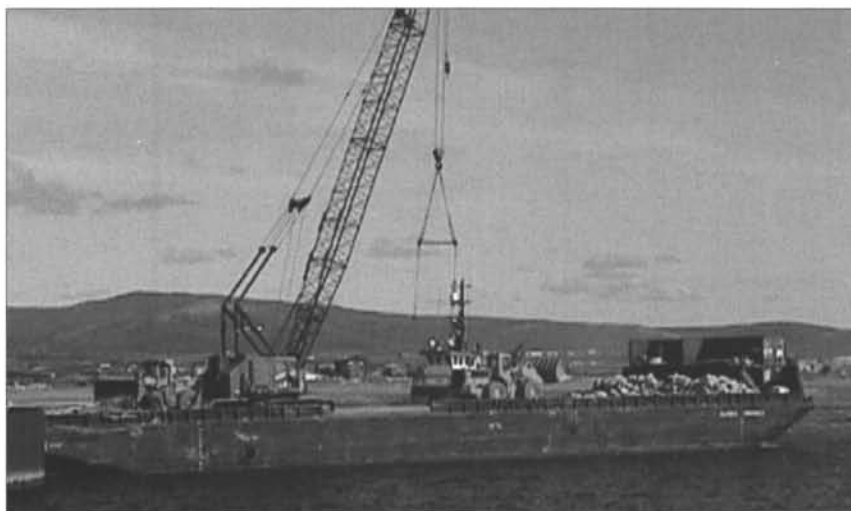


Table 17. Fort Knox Gold Mine production statistics, 1996-99

	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

from the Poker Flats lease. About 563,000 short tons were exported to the KEPCO facility in Korea via the Alaska Railroad and the coal-loading facility at the port of Seward.

Some of the coal in the lowest seam on the Two Bull Ridge is "shaley" and would be ideal for the new Clean Coal Plant at the mine mouth, but disagreements between the parties involved in the construction of the plant have cast a cloud on its future. The plant performed at more than 95 percent availability during a 90-day test-run.

INDUSTRIAL MINERALS

Most of the rock, sand and gravel in this region was used in road construction projects, particularly between Delta Junction and Tok, and east of Tok to the Canadian border. About 2.4 million tons of sand and gravel and 112,000 tons of rock were used in the work.

SOUTHCENTRAL REGION

METALS

Eight small placer mines produced a reported 305 ounces of gold in the southcentral region in 1999.

INDUSTRIAL MINERALS

About 5.1 million tons of sand and gravel and 440,000 tons of rock were used in road construction in the southcentral region in 1999. Much of the sand and gravel was derived from pits in the Palmer and Wasilla areas and hauled by the Alaska Railroad to the construction sites. The major road construction projects in the region were at miles 55–61 of the Glen Highway, miles 35–37 of the Parks Highway, miles 37–45 of the Sterling Highway, and widening of the railroad tunnel for road access to the port of Whittier on the Gulf of Alaska.

SOUTHWESTERN REGION

METALS

Eight placer gold mines produced 7,577 ounces of gold in 1999.

INDUSTRIAL MINERALS

About 126,000 tons of sand and gravel were used for construction in the Platinum and Goodnews areas.



Figure 19. View of ore processing facilities at Kinross Gold Corp.'s Fort Knox Mine. Conveyor belt at right side of photo leads from gyratory crusher and coarse ore stockpile to mill facilities. Tall buildings in center of photo contain mill facilities. Leach tanks and carbon-in-pulp tanks are behind the mill facilities. Office, warehouse, and maintenance shop facilities are located within the long rectangular building complex behind the tanks. Photo by Ryan Hull, DMLW.



Figure 20. View of office, shop, and milling complex at Fort Knox Mine, as described in figure 19, with tailings pond and impoundment dam in background. The tailings impoundment is a zero-discharge system and includes seepage control facilities and monitoring wells. Photo by Ryan Hull, DMLW.

SOUTHEASTERN REGION**METALS**

Greens Creek Mine (70.27 percent Kennecott Minerals Company, 29.73 percent Hecla Mining Company) produced a record amount of zinc and lead concentrate in 1999 (table 18) containing record amounts of gold and silver. From the 578,358 tons milled, the mine produced 68,527 tons of zinc, 25,503 tons of lead, 10,261,835 ounces of silver and 80,060 ounces of gold. The mine is

about 20 miles west of Juneau, and employs 275 permanent workers.

INDUSTRIAL MINERALS

About 229,000 tons of sand and gravel were used for road and other construction projects throughout the region, and about 1.7 million tons of crushed rock was used by the U.S. Forest Service to maintain the logging roads in the Tongass National Forest.

Table 18. *Greens Creek Mine production statistics, 1989–99*

	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

^aPart-year production.

-- Not reported.

DRILLING

Tables 19 and 20 summarize drilling activity in the state during 1999 by region and type of drilling. Many companies had significant drilling programs (table 21). Drilling totals continue the decline begun in 1998 due to slumping metal prices and difficulty in raising venture capital. In particular, placer drilling was down sharply, reflecting the

overall low amount of placer mining activity. The increase in the reverse-circulation drilling total from 1998 reflects more drilling at road-accessible properties, particularly in the Fairbanks and Nome areas (fig. 21). There was also an increase in underground exploration drilling due to the Pogo Project (fig. 22).

Table 19. *Drilling footage by region in Alaska, 1999*

Type of drilling	Northern	Western	Eastern interior	South- central	South- western	South- eastern	TOTAL
Placer subtotal	--	--	6,727	--	--	--	6,727
Coal subtotal	--	--	--	--	--	--	--
Hardrock core	95,100	4,367	111,866	2,442	29,201	126,887	369,863 ^a
Hardrock rotary	--	28,649	50,285	--	--	--	78,934
Hardrock subtotal	95,100	33,016	162,151	2,442	29,201	126,887	448,797
TOTAL (feet)	95,100	33,016	168,878	2,442	29,201	126,887	455,524

-- = Not reported.

^a108,022 feet of core drilling was underground.

Note: Blasthole drilling not reported.

No drilling footage reported for Alaska Peninsula in 1999.

Table 20. Drilling footage reported in Alaska, 1982–99

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

^aCore and rotary drilling not differentiated prior to 1987.^b108,022 feet of core drilling was underground.

-- = Not reported.

Note: Blasthole drilling not reported. Approximately 4,920,000 feet in 1999. 5,000 feet of rotary drilling for sand and gravel not included in totals.

Table 21. Companies reporting significant drilling programs in Alaska, 1999

Alaska Placer Development	Placer Dome Exploration Inc.
Atna Resources Ltd.	Polar Mining Inc.
Camnor Resources Ltd.	Rubicon Minerals Corp./Atna Resources Ltd.
Consolidated Aston Resources Ltd.	Sumitomo Metal Mining America Inc.
Cominco Alaska Inc.	Teck Corp.
Hecla Mining Co.	Usibelli Coal Mine Inc.
Kennecott Exploration Co.	Ventures Resource Alaska Corp.
Kennecott Greens Creek Mining Co.	Viceroy Resource Corp.
Kinross Gold Corp.	WGM Inc.
Newmont Exploration Ltd.	Wilder Construction Co.
NovaGold Resources Inc.	



Figure 21 (top). Bryan Outwater, Bering Straits Native Corp. shareholder, works on TJ Enterprises reverse-circulation drill rig drilling for gold mineralization at NovaGold Resources' Anvil Creek properties near Nome. Drilling performed by a 5.5-inch-diameter hammer and tri-cone drill bit using a 900 CFM capacity compressor. Photo provided by Tom Sparks, Bering Straits Native Corp.

Figure 22 (bottom). Underground drilling station in Pogo decline. Drilling by Major Alaska Drilling Inc. using JKS Boyles B15 drill rig. Photo provided by Teck Resources Inc.



GOVERNMENT ACTIONS

Table 22 shows the revenues to the state and to several municipalities from the mining industry. The increase in state claim rentals reflects both the maturing of several claim blocks and the consequent doubling of the rental payments, as well as the cost-of-living increase built into the statute requiring the rental. The Mining License Tax will also increase as the 3.5-year exemption is exceeded by operating mines.

The DGGs Airborne Geophysical/Geological Mineral Inventory project was first funded in FY93 as a multi-year investment to expand the knowledge base of Alaska's mineral resources and catalyze private-sector mineral development. The first mineral district surveys were flown in

1993. As of December 1999, 4.62 million acres of geophysical surveys in 14 areas across Alaska had been released (table 23).

In 1999 the State Division of Geological & Geophysical Surveys (DGGs) contracted for an airborne geophysical survey of about 1,000 square miles northwest of the Pogo deposit, and included radiometrics with the standard electromagnetic and magnetic components. The results are expected by early 2000. Another magnetic/electromagnetic survey of parts of Prince of Wales Island in southeastern Alaska was completed in 1999 with funding from the U.S. Bureau of Land Management, the Ketchikan Gateway Borough, the cities of Coffman Cove and Helm Bay and the

Table 22. Revenues paid to the State of Alaska and municipalities by Alaska's mineral industry, 1994–99^a

	1994	1995	1996	1997	1998	1999
State mineral rents and royalties						
State claim rentals ^b	\$ 805,291	\$ 703,508	\$ 917,970	\$ 1,036,782	\$ 1,170,812	\$ 1,982,453
Production royalties	11,003	13,661	20,002	8,930	9,489	14,214
Annual labor	42,682	32,195	55,195	80,795	118,020	90,720
Subtotal	858,976	749,364	993,166	1,126,507	1,298,321	2,087,387
State coal rents and royalties						
Rents	199,124	172,026	188,210	173,773	331,716	205,983
Royalties	1,391,614	1,866,954	996,408	1,342,077	19,378,995	2,615,858
Bonus	0	0	0	0	0	0
Offshore Prospecting Permits	3,221	4,182	0	0	0	0
Subtotal	1,593,959	2,043,162	1,184,619	1,515,851	2,269,711	2,821,841
State material sales						
Mental Health	0	10,108	63,324	57,620	40,269	32,407
Division of Land	218,876	351,094	699,845	278,913	1,043,602	586,550
SPCO	128,062	115,745	26,673	27,579	28,491	28,941
Subtotal	346,938	476,947	789,842	364,111	1,112,362	647,898
State mining miscellaneous fees						
Filing Fees	1,290	2,074	1,500	4,187	-251	4,288
Penalty Fees	0	1,000	0	0	0	8,000
Explore incentive app filing fee	0	0	0	0	2,000	3,000
Bond pool payment	63,251	60,619	87,411	91,666	79,929	70,692
Surface coal mining app fee	1,350	7,530	36,728	-16,100	6,890	2,500
APMA mining fees	14,253	19,950	21,950	22,454	18,975	19,288
Subtotal	80,144	91,173	147,589	102,207	107,543	107,767
Mining license ^c	481,907	484,035	481,000	1,900,000	2,037,226	2,400,000
State total	3,361,924	3,844,680	3,596,215	5,008,676	6,825,163	8,064,893
Payments to Municipalities	N/A	N/A	N/A	8,386,000	7,934,000	8,818,819
TOTAL	\$2,880,017	\$3,360,645	\$3,115,215	\$13,394,676	\$14,759,163	\$16,883,712

^aDoes not include state corporate income taxes, which were not released for this study.

^bIncludes upland lease and offshore lease rentals.

^cIncludes metals, coal, and material.

N/A = not available.

-- = not reported.

SOURCE: Municipalities, companies, and DNR Financial Services Section.

Table 23. Airborne geophysical survey work released by DGGs as of December 1999

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
Salcha River/North Pogo	1,032 sq. miles	Airborne geophysical mapping (ground-truth begins in FY01; 3-year project)
Total: 8 years \$4.4 million	7,235 sq. miles	1.2% of Alaska's total area

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

Alaska State Mental Health Land Office, with additional survey data from previous years provided by Sealaska Native Corp.

A team of geologists from DGGs began bedrock and surficial geologic mapping in the Fortymile area during 1999 (fig. 23). This area had been the subject of a 1998 airborne survey. A preliminary geologic map of the Eagle A-2 Quadrangle will be released by mid 2000. Field mapping will continue in 2000. A team of scientists from the U.S. Geological Survey and the Alaska Division of Mining, Land & Water conducted baseline water geochemical sampling and geological mapping program in the Fortymile and Goodpaster River drainages east of Fairbanks.

DGGs and USGS geologists also mapped a portion of the Talkeetna Mountains Quadrangle within the DGGs Iron Creek geophysical survey area. A preliminary geologic map and rock sample analytical results are expected to be released by mid 2000.

The U.S. Department of the Interior's Minerals Management Service distributed \$4.16 million to Alaska in 1999 as part of the state's share of revenue collected for minerals production on federal lands within the state, plus offshore tracts adjacent to Alaska's shore. The money, \$245,935 of which came from offshore tracts, represents the state's share of bonuses, rents and royalties. A total of \$541.4 million was paid to 36 states in 1999 under the

program. Amounts vary from year to year according to production and market prices. Alaska was tenth on the payout list, far behind Wyoming, which ranked first with \$241 million.

Red Dog Operations received the Exporter of the Year Award for 1999 from Alaskan governor Tony Knowles. The award acknowledged the successful completion of Red Dog's expansion program and the mine's ability to deliver



Figure 23. Inflatable kayak beached on gravel bar along the Dennison Fork of the Fortymile River. One of many transportation methods used by DGGs to map the Fortymile area. Photo by David Szumigala.

higher volumes of ore concentrates to offshore markets.

The 1999 Alaska reclamation award was given to Wayne Gibson for his reclamation efforts on Golden Creek in the Melozitna mining district (figs. 24, 25).

The Delta Mine Training Center (DMTC) was established in Delta Junction, Alaska in early 1999. DMTC was formed to inform community members in the region about the mineral industry and to prepare workers to enter jobs in mining and exploration. The DMTC is a consortium of the following organizations:

- Alaska Miners Association
- University of Alaska Anchorage - Mining and Petroleum Training Service (MAPTS)
- University of Alaska Fairbanks - Tanana Valley Campus
- Tanana Chiefs Conference, Inc.
- Delta/Greely School District

DMTC is now training workers for employment in underground mines. In addition to a 7-week underground miner course, DMTC also provides courses in basic geology, prospecting, and basic field exploration techniques. DMTC plans to develop a training adit for instruction use and add more courses to its schedule.

The Alaska Department of Natural Resources (DNR), Division of Mining, Land & Water (DMLW) offered 28

offshore mining lease tracts near Nome for competitive bid. DMLW received 76 bids from 15 bidders totaling \$190,000 for 12,292 acres. Successful bidders received an offshore mining lease that grants exclusive right to locatable minerals in the offshore area on state-owned tide and submerged land. Lease tracts ranged in size from 100 to 1,440 acres and leases were issued for a term of ten years subject to renewal dependent on obtaining all necessary permits from regulating agencies having jurisdiction.

The Land Records Information Section (LRIS) of DNR is in the process of streamlining access to mining claim information. LRIS is building a WorldWideWeb site for on-line status plats at <http://www.dnr.state.ak.us/landrecords>. A status plat is a state document that describes the location of state land, the classification of the land, and assignments of state interest in land. A status plat is the graphic land record of the department. The township (36 square miles) is the standard format for a status plat. If there is too much activity to map at this scale, cartographers will create supplemental plats. The most complex townships in the state can have over 100 supplementals. Simple townships with limited activity can have a single plat. DNR maintains about 17,000 plats. LRIS is also working on streamlining the processing of mining claims. Eventually the DNR system will process and load mining claims from data inputted into the computer at State Recorder's offices. The system will also be built to automate the notation of status plats with new mining claims.



Figures 24 & 25. *Reclamation of Golden Creek in the Melozitna mining district by Wayne Gibson. Photos by Ryan Hull, DMLW.*

New claims staked in Alaska 1995-1999

Quad no.	Quadrangle name	New federal mining claims					New state mining claims				
		1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
17	Point Hope	0	0	0	0	0	0	43	0	0	0
18	De Long Mountains	0	0	0	0	0	28	0	0	0	6,054 ^a
20	Howard Pass	0	0	0	0	0	0	0	0	0	183
23	Philip Smith Mountains	0	0	0	0	0	0	0	0	0	0
26	Noatak	0	0	0	0	0	61	634	96	0	514
27	Baird Mountains	1	0	1	0	0	18	1	0	1	65
28	Ambler River	0	0	0	0	0	95	0	1,333	6	0
29	Survey Pass	0	0	0	0	0	0	0	722	0	0
30	Wiseman	20	0	47	90	13	34	6	44	108	85
31	Chandalar	12	3	17	1	13	502	118	75	37	0
32	Christian	0	0	0	0	0	0	0	0	0	0
35	Kotzebue	0	0	0	0	0	4	0	28	0	0
36	Selawik	0	0	0	0	0	0	0	0	0	2
37	Shungnak	0	0	0	0	0	0	0	0	0	0
38	Hughes	0	0	0	0	0	0	0	72	1	1
39	Bettles	7	0	56	28	12	4	0	0	2	1
43	Teller	0	0	0	0	0	42	0	0	0	25
44	Bendeleben	0	0	0	0	0	31	55	67	45	60
45	Candle	0	0	0	0	0	21	16	201	10	55
47	Melozitna	0	0	0	0	0	4	4	0	0	0
48	Tanana	0	0	0	0	0	53	76	99	87	24
49	Livengood	0	0	1	0	0	545	1,838	352	32	38
50	Circle	0	0	0	0	0	413	100	658	698	410
51	Charley River	0	0	0	0	0	0	0	0	0	0
52	Nome	0	0	0	0	0	168	195	78	42	0
53	Solomon	0	0	0	0	0	39	31	29	10	2
54	Norton Bay	0	0	0	0	0	25	0	0	0	0
55	Nulato	0	0	0	0	0	0	0	0	0	80
56	Ruby	0	0	0	0	0	12	405	200	718	90
57	Kantishna River	0	0	1	0	0	14	0	0	0	8
58	Fairbanks	0	0	0	0	0	364	360	546	111	22
59	Big Delta	0	0	0	0	0	421	637	1,010	4,595	3,084 ^b
60	Eagle	0	0	0	0	0	116	122	171	722	371
64	Ophir	0	0	0	0	0	8	13	47	3	11
65	Medfra	0	0	0	0	0	0	0	128	46	38
66	Mt. McKinley	0	0	0	0	0	0	0	0	0	0
67	Healy	0	0	0	0	0	335	80	388	641	66
68	Mt. Hayes	171	124	772	2	0	858	622	1,185	975	483
69	Tanacross	0	0	0	0	0	69	236	112	748	307
72	Holy Cross	0	0	0	0	0	0	0	0	0	0
73	Iditarod	0	70	0	0	0	223	414	296	94	0
74	McGrath	0	0	0	0	0	0	0	0	0	32
75	Talkeetna	3	0	0	0	0	48	129	117	111	73
76	Talkeetna Mountains	0	0	4	0	0	48	234	50	131	3
77	Gulkana	0	0	0	0	0	0	0	192	7	247
78	Nabesna	0	0	0	0	0	0	0	2	0	5
81	Russian Mission	0	0	0	0	0	0	0	0	0	0
82	Sleetmute	0	0	0	0	0	22	0	0	0	80
83	Lime Hills	0	0	0	0	0	8	2	238	26	12
84	Tyonek	0	0	0	0	0	8	0	10	34	69
85	Anchorage	0	0	0	0	0	79	18	97	88	40
86	Valdez	0	0	0	0	0	20	11	8	0	0
87	McCarthy	0	0	0	0	0	0	0	0	52	0
91	Bethel	0	0	0	0	0	0	0	98	0	0

Quad no.	Quadrangle name	New federal mining claims					New state mining claims				
		1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
92	Taylor Mountains	0	0	0	0	0	5	0	142	37	0
93	Lake Clark	0	0	0	0	0	0	0	0	0	0
94	Kenai	0	0	0	0	0	0	0	0	0	0
95	Seward	58	0	108	44	24	21	23	26	22	38
96	Cordova	0	0	1	0	0	0	0	0	3	0
97	Bering Glacier	0	0	0	0	0	0	2	3	2	0
102	Dillingham	0	0	0	0	0	4	7	32	0	0
103	Iliamna	0	0	0	0	0	1	1	325	1	0
104	Seldovia	0	0	0	0	0	0	0	0	0	0
107	Icy Bay	0	0	0	0	0	0	0	3	0	0
108	Yakutat	0	0	0	0	0	0	0	0	0	0
109	Skagway	2	0	4	0	1	36	8	5	1	38
111	Mt. Fairweather	0	0	0	0	0	0	0	0	0	0
112	Juneau	63	199	263	52	10	10	20	2	0	2
114	Sitka	2	0	7	10	0	2	0	0	3	0
115	Sumdum	0	0	0	0	0	0	0	0	0	0
116	Port Alexander	0	0	0	0	0	0	0	0	0	0
117	Petersburg	23	267	485	183	98	0	0	0	180	2
118	Bradfield Canal	0	0	0	0	0	0	0	0	0	0
119	Craig	14	18	101	3	137	0	48	0	6	0
120	Ketchikan	0	0	2	0	0	0	0	0	3	0
121	Dixon Entrance	0	0	1	14	0	0	0	0	0	0
123	Hagemeister Island	0	0	0	0	0	0	0	0	0	0
127	Afognak	0	0	0	0	0	32	0	0	0	0
133	Chignik	0	0	0	0	0	0	0	0	0	0
135	Trinity Islands	0	0	0	0	0	38	35	5	0	63
138	Port Moller	0	0	0	0	0	0	0	0	0	10
	TOTALS	376	681	1,871	427	308	4,889	6,544	9,292	10,439	12,793

^aCompany records.^bVarious sources.

SOURCE: State of Alaska Division of Mining, Land & Water Kardex file, DNR Public Information Center and Land Records Information Section, DNR.

APPENDIX B

Prospecting sites in Alaska 1995–1999

Quad no.	Quad name	1995 New	1995 Extended	1995 Total	1996 New	1996 Extended	1996 Total	1997 New	1997 Extended	1997 Total	1998 New	1998 Extended	1998 Total	1999 New	1999 Extended	1999 Total
17	Point Hope	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0
18	DeLong Mountains	0	0	0	0	0	0	0	0	0	0	0	0	27	0	27
19	Misheguk Mts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	Noatak	16	0	16	32	0	32	0	0	0	0	0	0	0	0	0
27	Baird Mts.	6	0	6	9	0	9	0	0	0	0	0	0	0	0	0
28	Ambler River	--	--	--	--	--	--	--	--	--	0	10	10	0	0	0
30	Wiseman	10	0	10	61	0	61	10	5	15	25	0	25	0	12	12
31	Chandalar	2	5	7	28	0	28	34	0	34	15	0	15	14	14	28
33	Coleen	--	--	--	--	--	--	--	--	--	0	13	13	0	0	0
36	Selawik	--	--	--	--	--	--	--	--	--	3	0	3	1	0	1
38	Hughes	--	--	--	--	--	--	--	--	--	0	4	4	1	0	1
43	Teller	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
44	Bendeleben	5	4	9	48	0	48	28	16	44	0	26	26	4	0	4
45	Candle	5	0	5	8	0	8	91	0	91	0	27	27	6	8	14
47	Melozitna	0	0	0	222	128	350	0	96	96	0	6	6	8	0	8
48	Tanana	54	15	69	309	133	442	21	193	214	2	0	2	171	0	171
49	Livengood	324	38	362	43	194	237	162	34	196	162	0	162	90	103	193
50	Circle	169	85	254	136	166	302	189	110	299	276	142	418	93	61	154
52	Nome	45	10	55	96	34	130	52	45	97	16	28	44	21	0	21
53	Solomon	19	1	20	29	5	34	11	38	49	8	12	20	10	0	10
55	Nulato	0	0	0	4	0	4	6	0	6	0	0	0	22	0	22
56	Ruby	0	0	0	21	0	21	70	18	88	47	31	78	8	39	47
57	Kantishna River	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0
58	Fairbanks	85	17	102	124	20	144	58	33	91	77	20	97	22	39	61
59	Big Delta	45	33	78	102	42	144	286	16	302	1,849	230	2,079	977	1,332	2,309
60	Eagle	34	7	41	48	11	59	67	48	115	263	88	351	29	144	173
64	Ophir	0	0	0	0	0	0	33	0	33	0	43	43	0	0	0
65	Medfra	3	0	3	16	0	16	28	8	36	0	0	0	2	0	2
67	Healy	12	0	12	112	7	119	472	119	591	260	355	615	15	46	61
68	Mt. Hayes	2	12	14	236	12	248	230	30	260	81	97	178	29	63	92
69	Tanacross	6	166	172	68	0	68	38	15	53	53	38	91	171	39	210
73	Iditarod	0	0	0	182	0	182	4	66	70	16	7	23	0	0	0
74	McGrath	6	0	6	13	6	19	203	12	215	53	89	142	92	0	92

APPENDIX B
Prospecting sites in Alaska 1995–1999
(continued)

Quad #	Quad name	1995	1995	1995	1996	1996	1996	1997	1997	1997	1998	1998	1998	1999	1999	1999
		New	Extend	Total	New	Extend	Total	New	Extend	Total	New	Extend	Total	New	Extend	Total
75	Talkeetna	14	3	17	37	5	42	390	39	429	99	92	191	7	9	16
76	Talkeetna Mts.	41	40	81	17	21	38	18	0	18	43	15	58	3	32	35
77	Gulkana	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0
78	Nabesna	--	--	--	--	--	--	--	--	--	0	8	8	0	0	0
81	Russian Mission	0	0	0	0	0	0	45	0	45	0	0	0	0	0	0
82	Sleetmute	0	0	0	0	0	0	46	0	46	0	20	20	0	0	0
83	Lime Hills	0	0	0	0	0	0	5	0	5	1	0	1	0	0	0
84	Tyonek	0	0	0	0	0	0	6	14	20	1	0	1	4	0	4
85	Anchorage	16	9	25	18	7	25	22	0	22	8	0	8	8	2	10
86	Valdez	13	0	13	9	15	24	0	0	0	0	0	0	0	0	0
91	Bethel	0	0	0	12	6	18	4	8	12	0	0	0	18	0	18
92	Taylor Mts.	0	0	0	14	0	14	6	6	12	32	0	32	0	0	0
94	Kenai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	Seward	1	0	1	73	40	113	2	24	26	8	5	13	17	0	17
97	Bering Glacier	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
102	Dillingham	0	0	0	0	0	0	48	0	48	0	20	20	0	102	102
103	Iliamna	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	Seldovia	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
109	Skagway	0	0	0	13	0	13	6	0	6	4	0	4	17	0	17
112	Juneau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	Craig	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	Ketchikan	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0
135	Trinity Islands	1	2	3	14	0	14	0	0	0	17	0	17	2	14	16
TOTALS		943	447	1,390	2,157	852	3,009	2,699	993	3,692	3,419	1,431	4,850	1,892	2,060	3,952

SOURCE: State of Alaska Division of Mining, Land & Water Kardex file, DNR Public Information Center.

- -Data not available.

APPENDIX C

Mining licenses issued by and received from the Alaska Department of Revenue and the Alaska Division of Mining, Land & Water, 1999

Entries include in this order: company name (region), address, resource, site of operation, mining district, and license number. 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).

Ackels, Del M. (NR) 1725 Roosevelt St. Fairbanks, AK 99709-5112 Gold Big Creek Chandalar district	Bear Creek Hughes district	Aldridge, William J. (EIR) PO Box 1334 Palmer, AK 99645-1334 Gold Turk Creek Fortymile district	Andresen, John R. (EIR) PO Box 10263 Fairbanks, AK 99710-0263 Gold Dome Creek Fairbanks district
Adler, Kevin P. (SCR) 11976 Wilderness Dr. Anchorage, AK 99516-2238 Gold Peters Creek Yentna district	Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Dry Creek Nome district	Alminco Alaska Mining Co. Inc. (NR) PO Box 91219 Anchorage, AK 99509-1219 Gold Hammond River Koyukuk district	Angell, William (EIR) 417 Glacier Ave. Fairbanks, AK 99701-3722 Gold Fortymile River Fortymile district
Agoff, Alvin H. (SWR) PO Box 2791 Palmer, AK 99645-2791 Gold Prince Creek Iditarod district	Alaska Gold Co. (EIR) PO Box 71170 Fairbanks, AK 99707-1170 Gold Goldstream Creek Fairbanks district	American Metals Exploration Inc. (NR) c/o Bogle & Gates Law Offices 1031 W 4th Ave. #600 Anchorage, AK 99501-5907 Gold Big Creek Chandalar district	Arctic Whitney Inc. (WR) PO Box 782 Nome, AK 99762-0782 Gold Norton Sound Nome district
Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Anvil Creek Nome district	Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Center Creek Nome district	Amidon, Steven C. (SCR) 1925 Buckeye Ln. Wasilla, AK 99654-3125 Gold Thunder Creek Yentna district	Arctic Whitney Inc. (WR) PO Box 782 Nome, AK 99762-0782 Gold Norton Sound Nome district
Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Anvil Creek Nome district	Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Dry Creek Nome district	Anderson II, Allan G. (WR) PO Box 37 McGrath, AK 99627-0037 Gold Dodge Creek Innoko district	Argo, Adam T. (EIR) 3705 Arctic Blvd. # 957 Anchorage, AK 99503-5774 Gold Mosquito Fork Fortymile district
Alaska Gold Co. (WR) PO Box 640 Nome, AK 99762-0640 Gold Anvil Creek Nome district	Alaska/Nevada Gold Mines (EIR) 626 Second St. Ste. 202 Fairbanks, AK 99701-3466 Gold Livengood Creek Tolovana district	Anderson, Gerald I. (SCR) 11920 Northern Raven Dr. Anchorage, AK 99516-1935 Gold Yacko Creek Nelchina district	Babcock, Jack G. (EIR) 1650 Appaloosa Ln. Fairbanks, AK 99709-6729 Gold Switch Creek Circle district
Alaska Gold Co. (EIR) PO Box 71170 Fairbanks, AK 99707-1170 Gold Cleary Creek Fairbanks district	Alaska Pacific Trust Co. (EIR) PO Box 71230 Fairbanks, AK 99707-1230 Gold Goldstream Creek Fairbanks district	Anderson, Ralph S. (WR) PO Box 1974 Nome, AK 99762-1974 Gold Coffee Creek Kougarok district	Babcock, Patricia R. (EIR) 1650 Appaloosa Ln. Fairbanks, AK 99709-6729 Gold Switch Creek Circle district
Alaska Gold Co. (EIR) PO Box 71170 Fairbanks, AK 99707-1170 Gold Little Eldorado Creek Fairbanks district	Aldridge, Shirley B. (EIR) PO Box 1334 Palmer, AK 99645-1334 Gold Poker Creek Fortymile district	Anderson, Randi M. (EIR) 1901 Cheechako Dr. Fairbanks, AK 99709-6542 Gold Tenderfoot Creek Fairbanks district	Bailey, George D. (EIR) PO Box 2052 Fairbanks, AK 99701-2052 Gold Fox Creek Fairbanks district
Alaska Gold Co. (EIR) PO Box 71170 Fairbanks, AK 99707-1170 Gold Ester Creek Fairbanks district	Aldridge, William J. (EIR) PO Box 1334 Palmer, AK 99645-1334 Gold Poker Creek Fortymile district		Bartholomae, Bill A. (WR) PO Box 2701 Orange, CA 92859-2701 Gold

Gold Run Creek
Port Clarence district

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

Baughman, Errol G. (EIR)
HC 69 Box 91
Belle Fourche, SD 57717-8801
Gold
Gilmore Creek
Fairbanks district

Beck Jr., Jessie D. (EIR)
PO Box 867
Tok, AK 99780-0867
Gold
South Fork Fortymile River
Fortymile district

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

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

Beistline, Earl H. (EIR)
PO Box 80148
Fairbanks, AK 99708-0148
Gold
Goldstream Creek
Fairbanks district

Benesch, George (WR)
PO Box 101558
Anchorage, AK 99510-1558
Gold
Coffee Creek
Kougarok district

Berg, Carol B. (EIR)
450 Westridge Dr.
Portola Valley, CA 94028-7719
Gold
Ester Creek
Fairbanks district

**Berg, Rhinehart M./Thorleif
Wetlesen, Estate of (WR)**
c/o Wallis W. Brooks
325 Garrison Way
Gulph Mills, PA 19428
Gold
Candle Creek
Fairhaven district

**Berg, Rhinehart M./Thorleif
Wetlesen, Estate of (WR)**
c/o Wallis W. Brooks

325 Garrison Way
Gulph Mills, PA 19428
Gold
Candle Creek
Fairhaven district

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

Berry, William F. (EIR)
450 Westridge Dr.
Portola Valley, CA 94028-7719
Gold
Ketchum Creek
Cirele district

Berry, William F. (EIR)
450 Westridge Dr.
Portola Valley, CA 94028-7719
Gold
Ester Creek
Fairbanks district

Bickell, D. Harvey (EIR)
Rr1 Site 7
Gabriola B.C.
Gold
Walker Fork
Fortymile district

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

Black, Dennis (NR)
PO Box 80930
Fairbanks, AK 99708-0930
Gold
Big Creek
Chandalar district

Blair, Patricia A. (SCR)
PO Box 572
Cooper Landing, AK 99572
Gold
Quartz Creek
Seward district

Boundary 8 (EIR)
c/o Norman Laframboise
100 1328 Commissioner's Rd. W.
London, Ontario N6K2Y6
Canada
Gold
Turk Creek
Fortymile district

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

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

Bradley, Joe (SCR)
529 Lynwood Dr.
Anchorage, AK 99518-1856
Gold
Skookum Creek
Yentna district

Brandl, Philip A. (SCR)
14251 Sabine St.
Anchorage, AK 99516-3912
Gold
Cache Creek
Yentna district

Brandl, Philip A. (SCR)
14251 Sabine St.
Anchorage, AK 99516-3912
Gold
Cache Creek
Yentna district

Brandl, Philip A. (SCR)
14251 Sabine St.
Anchorage, AK 995163912
Gold
Cache Creek
Yentna district

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

Brexco Inc. (NR)
423 E 5th Ave.
Anchorage, AK 99501
Gold
Lake Creek
Koyukuk district

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

Brittan, Jon (WR)
PO Box 1313
Nome, AK 99762-1313
Gold
Norton Sound
Nome district

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

Brooks, Wallis (WR)
Berg/Wetlesen Estate
325 Garrison Way
Gulph Mills, PA 19428
Gold
Candle Creek
Fairhaven district

Bryant, Thomas L. (NR)
PO Box 264
Ridgway, CO 81432-0264
Gold
Hammond River
Koyukuk district

Bryant, Thomas L. (NR)
PO Box 264
Ridgway, CO 81432-0264
Gold
Chapman Creek
Koyukuk district

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

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

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

Busk, Leroy (SWR)
PO Box 190649
Anchorage, AK 99519-0649
Gold
Syneva Creek
Aniak district

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

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

Calista Corporation (SWR)
301 Calista Court Ste. A
Anchorage, AK 99518-3028
Gold
Queen Gulch
Iditarod district

Carlo, Kenneth J. (EIR) 2113 Southern Ave. Fairbanks, AK 99709-4240 Gold Hunter Creek Rampart district	Clark, Douglas M. (WR) PO Box 586 Talkeetna, AK 99676-0586 Gold Ganes Creek Innoko district	Comstock, B. W. (WR) 10508 Fawn Dr. NW Gig Harbor, WA 98332-9510 Gold Candle Creek Fairhaven district	Doyon Ltd. (SCR) 201 First Ave. Ste. 300 Fairbanks, AK 99701-4848 Gold Candle Creek McGrath district
Carlton, Allen (EIR) 6318 97th Dr. NE Everett, WA 98205-1011 Gold Mosquito Fork Fortymile district	Clay, Barry L. HC5 Box 6765a Palmer, AK 99645-9611 Gold Swift Creek Ruby district	Cope, Roger C. (EIR) PO Box 75404 Fairbanks, AK 99707-5404 Gold Lewis Creek Fairbanks district	Doyon Ltd. (EIR) 201 First Ave. Ste. 300 Fairbanks, AK 99701-4848 Gold American Creek Fortymile district
Carlton, Norma (EIR) 6318 97th Dr. NE Everett, WA 98205-1011 Gold Mosquito Fork Fortymile district	Cloyd, Donald R. (NR) 8650 Cameron St. Anchorage, AK 99507-3519 Gold Lake Creek Koyukuk district	Cornelius, Fred G. (EIR) 1615 Madison Dr. Fairbanks, AK 99709-5033 Gold Fox Creek Fairbanks district	Doyon Ltd. (EIR) 201 First Ave. Ste. 300 Fairbanks, AK 99701-4848 Gold Cache Creek Hot Springs district
Carr, Brad (EIR) PO Box 25 Chicken, AK 99732-0025 Gold South Fork Fortymile River Fortymile district	Coggins, Anette (WR) PO Box 3427 Homer, AK 99603-3427 Gold Lower Willow Nome district	Coup, Cindy (NR) PO Box 1574 Soldotna, AK 99669-1574 Gold South Fork Koyukuk River Koyukuk district	Doyon Ltd. (EIR) 201 First Ave. Ste. 300 Fairbanks, AK 9970-4848 Gold Woodchopper Creek Hot Springs district
Carr, Brad (EIR) PO Box 25 Chicken, AK 99732-0025 Gold Fortymile River Fortymile district	Coggins, Anette (WR) PO Box 3427 Homer, AK 99603-3427 Gold Norton Sound Nome district	Coup, Joe (NR) PO Box 1574 Soldotna, AK 99669-1574 Gold South Fork Koyukuk River Koyukuk district	Eagan, Dan F. (EIR) 1564 Hilton Ave. Fairbanks, AK 99701-4016 Gold Goldstream Creek Fairbanks district
Catt, Barbara J. (EIR) PO Box 45 Central, AK 99730-0045 Gold Crooked Creek Circle district	Coggins, Craig C. (WR) PO Box 3427 Homer, AK 99603-3427 Gold Lower Willow Nome district	Cox, Cecil (EIR) PO Box 16213 Two Rivers, AK 99716 Gold Fortymile River Fortymile district	Eagan, Peter (EIR) PO Box 71170 Fairbanks, AK 99707 Gold Kokomo Creek Fairbanks district
Catt, D. Bruce (EIR) PO Box 45 Central, AK 99730-0045 Gold Crooked Creek Circle district	Coggins, Craig C. (WR) PO Box 3427 Homer, AK 99603-3427 Gold Norton Sound Nome district	Cox, Jamie C. (EIR) PO Box 16213 Two Rivers, AK 99716 Gold Fortymile River Fortymile district	Earth Movers Of Fairbanks Inc. (EIR) 925 Aurora Dr. Fairbanks, AK 99709-5538 Gold Fairbanks Creek Fairbanks district
Cavanagh, James D. (WR) PO Box 80787 Fairbanks, AK 99708-0787 Gold Crescent Creek Innoko district	Coiner, Doris (SCR) 1831 Balsam Rd. NW Bemidji, MN 56601-8166 Gold Valdez Creek Valdez Creek district	Daugherty, Joe A. (SWR) HC 05, Box 9749 Palmer, AK 99645-9509 Gold Taylor Creek Aniak district	Eaves, Samuel E. (EIR) PO Box 10357 Fairbanks, AK 99710-0357 Gold Livengood Creek Tolovana district
Christensen, Kathleen (SCR) PO Box 871075 Wasilla, AK 99687-1075 Gold, heavy metals Beach Sands Yakataga district	Cole, John H. (EIR) PO Box 10139 Fairbanks, AK 99710-0139 Gold Portage Creek Circle district	Delima, Don P. (EIR) PO Box 56106 Manley Hot Springs, AK 99756-0106 Gold Golden Creek Hot Springs district	Edgerton, Judd (EIR) PO Box 34 Chicken, AK 99732-0034 Gold Napoleon Creek Fortymile district
Christensen, Robert E. (SCR) PO Box 871075 Wasilla, AK 99687-1075 Gold, heavy metals Beach Sands Yakataga district	Compass Mining Inc. (NR) PO Box 72700 Fairbanks, AK 99707-2700 Gold Linda Creek Koyukuk district	Dewitt, Estill (SCR) 200 W 34th Ave. # 843 Anchorage, AK 99503-3969 Gold Alfred Creek Willow Creek district	Ellis, Edward E. (SCR) PO Box 13443 Trapper Creek, AK 99683-0443 Gold Lake Creek Yentna district

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

Erikson, Gerald (EIR)
119 Charles St.
Fairbanks, AK 99701-3064
Gold
Fox Creek
Fairbanks district

Faa, Thomas E. (EIR)
PO Box 10906
Fairbanks, AK 99710-0906
Gold
Moose Creek
Bonnifield district

Fairbanks Exploration Inc. (EIR)
PO Box 73795
Fairbanks, AK 99707-3795
Industrial
N/A
Tolovana district

Fairbanks Gold Mining Inc. (EIR)
PO Box 73726
Fairbanks, AK 99707-3726
Gold
Gilmore Creek
Fairbanks district

Faulkner Sr, Harry E. (SWR)
PO Box 1307
Bethel, AK 99559-1307
Gold
Hot Springs
Aniak district

Faulkner, Eddie (SWR)
PO Box 1307
Bethel, AK 99559-1307
Gold
Hot Springs
Aniak district

Faulkner, Elizabeth (SWR)
PO Box 1307
Bethel, AK 99559-1307
Gold
Hot Springs
Aniak district

Faulkner, Jeannine P. (SWR)
PO Box 1307
Bethel, AK 99559-1307
Gold
Hot Springs
Aniak district

Fausett, Lonnie (WR)
228 E 350 S
Farmington, UT 84025-3209
Gold
Norton Sound
Nome district

Fejes, William (NR)
PO Box 430
Homer, AK 99603-0430
Gold
Boulder Creek
Koyukuk district

Fichtelman, Guy (EIR)
414 Hawk Eye Downs Dr.
Fairbanks, AK 99712-1213
Gold
Mosquito Fork
Fortymile district

Flothe, Milo Ellsworth, Estate of (SCR)
PO Box 242
Sterling, AK 99672-0242
Gold
Quartz Creek
Hope district

Flothe, Glenn M. (SCR)
PO Box 111968
Anchorage, AK 99511-1968
Gold
Quartz Creek
Hope district

Flothe, Winifred M. (SCR)
Route 2, Box 242
Sterling, AK 99672-0242
Gold
Quartz Creek
Hope district

Fogarty Sr., James L. (EIR)
3498 Laurance Rd.
North Pole, AK 99705-6705
Gold
Flume Creek
Fairbanks district

Fogarty, Sharon L. (EIR)
3498 Laurance Rd.
North Pole, AK 99705-6705
Gold
Flume Creek
Fairbanks district

Frantz, Peter Smith (NR)
PO Box 83172
Fairbanks, AK 99708-3172
Gold
Linda Creek
Koyukuk district

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

Fullerton, John E. (SWR)
16935 Maplewild Ave. SW
Seattle, WA 98166-3165
Gold
Flat Creek
Iditarod district

Fullerton, John R. (SWR)
PO Box 593
Porterville, CA 93258-0593
Gold
Flat Creek
Iditarod district

Fulton, Gordon (EIR)
PO Box 115
Central, AK 99730-9999
Gold
Switch Creek
Circle district

Funkhouser, Gladys A. (EIR)
1336 W 6th Ave.
Anchorage, AK 99501-1912
Gold (Underground)
N/A
Fairbanks district

Funkhouser, Peter J. (EIR)
1336 W 6th Ave.
Anchorage, AK 99501-1912
Gold (Underground)
N/A
Fairbanks district

Gagne, Suzanne (EIR)
3025 S Morgan Valley Dr.
Morgan, UT 84050-9666
Gold
Ester Creek
Fairbanks district

Garrett, Dennis R. (SCR)
PO Box 520481
Big Lake, AK 99652-0481
Gold
Gopher Gulch
Yentna district

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

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

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

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

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

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

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

Glassburn, Don (EIR)
PO Box 107
Central, AK 99730-0107
Gold
Gold Dust
Circle district

Glidden, Ralph F. (EIR)
PO Box 104
Tok, AK 99780-0104
Gold
Chicken Creek
Fortymile district

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

Globe Creek Mining Inc. (EIR)
1684 Chena Ridge Rd.
Fairbanks, AK 99709-2611
Limestone
N/A
Tolovana district

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

Goldmark Minerals Alaska Inc. (EIR)
1760 633 6th Ave. SW
Calgary
Gold
Walker Fork
Fortymile district

Gonzales, Richard (WR)
200 W 34th Ave. #1183
Anchorage, AK 99503
Gold
Offshore
Nome district

Goodson, Richard
107 Cushman St.
Fairbanks, AK 99701-4637
Gold
Seventymile River
Eagle district

Goresen, Dolores A. (SCR)
PO Box 91
Seward, AK 99664-0091
Gold
Tonsina Creek
Seward district

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

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

Greatland Exploration Ltd. (WR)
3512 Campbell Airstrip Rd.
Anchorage, AK 99504-3838
Gold
Norton Sound
Nome district

Green, Rosanna (EIR)
3025 S Morgan Valley Dr.
Morgana, UT 84050-9666
Gold
Ester Creek
Fairbanks district

Groethe, Lenhart (WR)
PO Box 1504
Kodiak, AK 99615-1504
Gold
Tripple Creek
Nome district

Groppel, Chris L. (EIR)
PO Box 1060
Delta Junction, AK 99737-1060
Gold
Tenderfoot Creek
Fairbanks district

Guidotti, Derek J. (SCR)
PO Box 671727
Chugiak, AK 99567-1727
Gold
Valdez Creek
Valdez Creek district

Gurule, Joe I. (EIR)
PO Box 235869
Honolulu, HI 96823-3515
Gold
Mosquito Fork
Fortymile district

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

Hamm, Ralph D. (NR)
4843 Rose Valley Rd.
Kelso, WA 98626-9431
Gold
Porcupine Creek
Koyukuk district

Hammond, Charles R. (EIR)
PO Box 7
Chicken, AK 99732-0007
Gold
45 Pup
Fortymile district

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

Hanneman, Karl (EIR)
626 2nd St. Ste. 202a
Fairbanks, AK 99701-3466
Gold
Livengood Creek
Tolovana district

Harmon, Robert W. (WR)
PO Box 1472
Nome, AK 99762-1472
Gold
Norton Sound
Nome district

Harmon, Robert W. (WR)
PO Box 1472
Nome, AK 99762-1472
Gold
Norton Sound
Nome district

Harris, Donald D. (EIR)
315 S Pearl St.
Centralia, WA 98531-4010
Gold
Slate Creek
Rampart district

Hart, Donald S. (EIR)
PO Box 172
Tok, AK 99780-0172
Gold
Jack Wade Creek
Fortymile district

Haskins, George R. (EIR)
PO Box 171
Healy, AK 99743
Gold
Goldstream Creek
Fairbanks district

Haskins, Laren S. (EIR)
PO Box 71777
Fairbanks, AK 99707-1777
Gold
Goldstream Creek
Fairbanks district

Hassel, Gerald L. (EIR)
PO Box 49
Ester, AK 99725-0049
Gold
Ready Bullion
Fairbanks district

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

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

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

Hendrickson Jr., Jack (EIR)
PO Box 30153
Central, AK 99730-0153
Gold
Bottom Dollar
Circle district

Hendrickson, Agnes (SCR)
3549 Dunkirk Dr.
Anchorage, AK 99502-3059
Gold
Falls Creek
Seward district

Hendrickson, Michael (SCR)
3549 Dunkirk Dr.
Anchorage, AK 99502-3059
Gold
Falls Creek
Seward district

Henkel, F. E. (EIR)
412 Glacier
Fairbanks, AK 99701-3723
Gold
Fortymile River
Fortymile district

Henning, John (WR)
630 B Jack St.
Anchorage, AK 99515-3431
Gold
N/A — Beach
Nome district

Hess, Luther C. (EIR)
Estate Trust
PO Box 900
Anchorage, AK 99510-0900
Gold
Goldstream Creek
Fairbanks district

Holt, Laurie A. (SCR)
PO Box 598
Moose Pass, AK 99631-0598
Gold
Quartz Creek
Hope district

Holt, Ryan L. (SCR)
PO Box 598
Moose Pass, AK 99631-0598
Gold
Quartz Creek
Hope district

Hopen, Alf (EIR)
PO Box 74246
Fairbanks, AK 99707
Gold
Cleary Creek
Fairbanks district

Horner, George R. (EIR)
Trust
PO Box 60610
Fairbanks, AK 99710-0610
Gold
Goldstream Creek
Fairbanks district

Horner, Joann E. (EIR)
PO Box 60610
Fairbanks, AK 99706-0610
Gold
Goldstream Creek
Fairbanks district

Houser, Janice (EIR)
Box 12
Chicken, AK 99732
Gold
Fortymile River
Fortymile district

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

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

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

**Melba Creek Mining Inc.
(EIR)**

PO Box 73726
Fairbanks, AK 99707-3726
Gold
Gilmore Creek
Fairbanks district

**Melba Creek Mining Inc.
(EIR)**

PO Box 73726
Fairbanks, AK 99707-3726
Gold
Hill Creek
Fairbanks district

Merrill, Bruce (SCR)

15411 Husky St.
Eagle River, AK 99577-9246
Gold
Falls Creek
Seward district

Merrill, Ivan (SCR)

PO Box 3503
Seward, AK 99664
Gold
Falls Creek
Seward district

**Midas Gold Resources Inc.
(NR)**

100 Cushman St., Ste. 311
Fairbanks, AK 99701-4659
Gold
Big Creek
Chandalar district

Minder, Richard B. (EIR)

PO Box 10263
Fairbanks, AK 99710-0263
Gold
Dome Creek
Fairbanks district

Mir Lic. (SCR)

c/o Stanley Pleninger
7410 Wade Cir.
Anchorage, AK 99518-2047
Gold
Valdez Creek
Valdez Creek district

Miscovich, Andrew W. (NR)

PO Box 71489
Fairbanks, AK 99707-1489
Gold
Porcupine Creek
Koyukuk district

Miscovich, Andrew W. (EIR)

PO Box 71489
Fairbanks, AK 99707-1489
Gold
Wolf Creek
Fairbanks district

Miscovich, Andy E. (EIR)

PO Box 1489
Fairbanks, AK 99707-1489

Gold
Gilmore Creek
Fairbanks district

Miscovich, John A. (SWR)

1093 N Greengrove St.
Orange, CA 92867-5812
Gold
Otter Creek
Iditarod district

Miscovich, Verda M. (NR)

PO Box 71489
Fairbanks, AK 99707-1489
Gold
Porcupine Creek
Koyukuk district

Miscovich, Verda M. (EIR)

PO Box 71489
Fairbanks, AK 99707-1489
Gold
Gilmore Creek
Fairbanks district

Mitchell, Harold (EIR)

Rr. 1 Box 287
Baraga, MI 49908-9749
Gold
Mosquito Fork
Fortymile district

Mitchell, Joseph D. (EIR)

Rr. 1 Box 322
Brookville, PA 15825-9721
Gold
Fortymile River
Fortymile district

Mitchell, Mona (EIR)

Rr. 1 Box 322
Brookville, PA 15825-9721
Gold
Fortymile River
Fortymile district

Mitchell, Rodney D. (EIR)

3133 Chena Hot Springs Rd.
Fairbanks, AK 99712-3304
Gold
Grubstake Creek
Bonnifield district

Montgomery, Lois (EIR)

3643 Road Dr. NW
Ephrata, WA 98823-9790
Gold
Gilliland Creek
Fortymile district

Montgomery, Melvin (EIR)

3643 Road Dr. NW
Ephrata, WA 98823-9790
Gold
Jack Wade Creek
Fortymile district

Montgomery, Melvin (EIR)

3643 Road Dr. NW
Ephrata, WA 98823-9790
Gold

Gilliland Creek
Fortymile district

Monzulla, Linda (EIR)

2920 Monzulla Ln.
Fairbanks, AK 99712-1737
Gold-tungsten
Gilmore Creek
Fairbanks district

**Monzulla, Vincent C.
(EIR)**

Rt # 1 Box 659a Ave I
Big Pine Key, FL 33043
Gold-tungsten
Gilmore Creek
Fairbanks district

Moore, Roger L. (EIR)

288 Rambling Rd #26
Fairbanks, AK 99712-1502
Gold
Ester Creek
Fairbanks district

Moran, Ted H. (SCR)

5611 Lionheart Dr.
Anchorage, AK 99508
Gold
Quartz Creek
Hope district

**Mrak Aklestad Hermon &
Hermon (SCR)**

PO Box 1963
Palmer, AK 99645-1963
Gold
Willow Creek
Willow Creek district

Mtnt Native Corp. (SCR)

PO Box 309
McGrath, AK 99627-0309
Gold
Candle Creek
McGrath district

**Mud Creek Mining Corp.
(WR)**

HC 1 Box 109
White Bird, ID 83554-9709
Gold
Mud Creek
Fairhaven district

N.B. Tweet & Sons (WR)

PO Box 1107
Nome, AK 99762-1107
Gold
Kougarok River
Kougarok district

Neubauer, Jack A. (EIR)

413 Cowles St.
Fairbanks, AK 99701-4434
Gold
Cache Creek
Hot Springs district

Neubauer, Jack A. (EIR)

413 Cowles St.

Fairbanks, AK 99701-4434
Gold
Golden Creek
Hot Springs district

Nevers, Harold A. (EIR)

8148 Pinewood Dr.
Juneau, AK 99801-8906
Gold
American Creek
Fortymile district

Newby Sr., Alan R. (EIR)

PO Box 55367
North Pole, AK 99705-5367
Gold
Little Boulder Creek
Hot Springs district

**Nicholson, Douglas C.
(NR)**

3865 Ullrbahn
Fairbanks, AK 99709-6106
Gold
Linda Creek
Koyukuk district

Norcross, Irene E. (WR)

PO Box 242
Willow, AK 99688-0242
Gold
Anvil Creek
Innoko district

Norcross, James H. (WR)

PO Box 242
Willow, AK 99688-0242
Gold
Anvil Creek
Innoko district

Nordeen, Claudene (NR)

887 Bouton Ct.
Fairbanks, AK 99712-1448
Gold
Emma Creek
Koyukuk district

**Nordeen, William H.
(NR)**

887 Bouton Ct.
Fairbanks, AK 99712-1448
Gold
Emma Creek
Koyukuk district

**Northern Lights Mining Inc.
(NR)**

544 North 600 W
Cedar City, UT 84720-2111
Gold
Rye Creek
Koyukuk district

**Northland Minerals, Inc.
(SCR)**

1817 Parkside Dr.
Anchorage, AK 99501-5751
Gold
Cache Creek
Yentna district

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

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

Nugget Creek Mining (SCR)
1817 Parkside Dr.
Anchorage, AK 99501-5751
Gold
Cache Creek
Yentna district

Nyac Mining Co. (SWR)
1634 W 13th Ave.
Anchorage, AK 99501-4217
Gold
Spruce Creek
Aniak district

O'Carroll, John, J., Estate of
(WR)
44 West Blithedale Ave.
Mill Valley, CA 94941
Gold
Dodge Creek
Innoko district

O'Carroll, Ellen M., Estate of
(SWR)
267 Sunset Way
Muir Beach, CA 94965-9752
Gold
Flat Creek
Iditarod district

Olmstead, Jim (NR)
c/o Richard L. Wright
3910 Tilleson Way
North Pole, AK 99705-6555
Gold
Gold Creek
Koyukuk district

Olson, Dave (WR)
PO Box 2159
Homer, AK 99603-2159
Gold
Canyon Creek
Nome district

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

Olson, Jeffrey G. (EIR)
408 E Exchange St.
Spring Lake, MI 49456-1902

Gold
Jack Wade
Fortymile district

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

Olson, Steven L. (EIR)
PO Box 10655
Fairbanks, AK 99710-0655
Gold
Eagle Creek
Circle district

On Line Expl. Svcs. Inc. (EIR)
11976 Wilderness Dr.
Anchorage, AK 99516-2238
Gold
Specimen Creek
Delta River district

O'Riley, Roger (WR)
PO Box 603
Willamina, OR 97396-0603
Gold
N/A — Beach
Nome district

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

Ott, Wendy A. (EIR)
PO Box 72748
Fairbanks, AK 99707-2748
Gold
Omega Creek
Hot Springs district

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

Owen, Jeffrey R. (EIR)
12307 E Stillwater Way
Redding, CA 96003-9540
Gold
Younger Creek
Fortymile district

Pacific Northwest Resources
Co. Inc. (EIR)
PO Box 4879
Vancouver, WA 98662-0879
Gold
Gilmore Creek
Fairbanks district

Patrick, Michael B. (EIR)
2015 S Main St.
Corona, CA. 91720-5345

Gold
Fortymile River
Fortymile district

Pennell, Jack (EIR)
PO Box 1928
Grand Junction, CO 81502-1928
Gold
Little Boulder Creek
Hot Springs district

Penz, David C. (SWR)
Box 29
Russian Mission, AK 99657
Gold
Buster Creek
Marshall district

Petersen, Donald E. (SER)
PO Box 172
Haines, AK 99827-0172
Gold
Porcupine Creek
Juneau district

Peterson, Lawrence A. (WR)
118 Slater Dr.
Fairbanks, AK 99701-3428
Gold
Ganes Creek
Innoko district

Peterson, Lawrence A. (EIR)
118 Slater Dr.
Fairbanks, AK 99701-3428
Gold
Little Eldorado
Fairbanks district

Pettigrew, Bert (WR)
PO Box 38
Ellensburg, WA 98926-0038
Gold
Anvil Creek
Nome district

Petty, Jack (EIR)
2305 E Polar Bear Ct.
North Pole, AK 99705-5500
Gold
Gilmore Creek
Fairbanks district

Philpott, Ellen (NR)
PO Box 72198
Fairbanks, AK 99707-2198
Gold
Smith Creek
Koyukuk district

Philpott, Roy (NR)
PO Box 72198
Fairbanks, AK 99707-2198
Gold
Smith Creek
Koyukuk district

Plano, Cynthia L. (WR)
PO Box 878275
Wasilla, AK 99687-8275

Gold
Anvil Creek
Innoko district

Plano, Daniel W. (WR)
PO Box 878275
Wasilla, AK 99687-8275
Gold
Anvil Creek
Innoko district

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

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

Polley, Margaret E. (EIR)
10809 Orelan Mill Rd.
Louisville, KY 40229-2427
Gold
South Fork Fortymile River
Fortymile district

Pomrenke, Steve G. (WR)
19579 63rd St.
Royalton, MN 56373-3727
Gold
Tripple Creek
Nome district

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

Raines, Larry R. (EIR)
1313 Skyline Dr.
Fairbanks, AK 997121151
Gold
Lewis Creek
Fairbanks district

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

Ramier, Brad (EIR)
PO Box 10570
Fairbanks, AK 99710-0570
Gold
N/A
Fairbanks district

Read, Donald M. (EIR)
PO Box 71638
Fairbanks, AK 99707-1638

Gold
Treasure Creek
Fairbanks district

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

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

Reeves, John (EIR)
PO Box 81941
Fairbanks, AK 99708-1941
Gold
Goldstream Creek
Fairbanks district

Reeves, Ramona (EIR)
PO Box 81941
Fairbanks, AK 99708-1941
Gold
Goldstream Creek
Fairbanks district

Richardson, Ralph R. (EIR)
PO Box 4589
Palmer, AK 99645-4589
Gold
Hall Creek
Fortymile district

Roberts, Mike D. (EIR)
PO Box 82182
Fairbanks, AK 99708-2182
Gold
Ltl. Eldorado
Fairbanks district

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

Roberts, Roger L. (WR)
300 E Dimond Blvd. Ste. 20
Anchorage, AK 99515-1949
Gold
Ophir Creek
Innoko district

Robison, Robert M. (NR)
760 E Martindale Ln.
Fillmore, UT 84631
Gold
Rye Creek
Koyukuk district

Roland, James G. (EIR)
710 McGrath Rd.
Fairbanks, AK 99712-1524

Gold
Moose Creek
Bonnifield district

Roland, James G. (EIR)
710 McGrath Rd.
Fairbanks, AK 99712-1524
Gold
Rex Creek
Bonnifield district

Roland, James G. (EIR)
710 McGrath Rd.
Fairbanks, AK 99712-1524
Gold
Ester Creek
Fairbanks district

Roman, Ronald L. (EIR)
PO Box 71614
Fairbanks, AK 99707-1614
Gold
Hill Creek
Fairbanks district

Roop Sr., John A. (EIR)
9499 Brayton Dr. Lot 22
Anchorage, AK 99507-4004
Gold
Fortymile River
Fortymile district

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

Ross, John (EIR)
776 Bullion Dr.
Fairbanks, AK 99712-2305
Gold
Kokomo Creek
Fairbanks district

Sanders, Kent (WR)
PO Box 2159
Homer, AK 99603-2159
Gold
Canyon Creek
Nome district

Sather, Norman M. (EIR)
1213 Coppet St.
Fairbanks, AK 99709-4724
Gold
Fairbanks Creek
Fairbanks district

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

Saunders, Frank L. (EIR)
PO Box 449

Ester, AK 99725-0449
Gold
Ester Creek
Fairbanks district

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

Schasteen, Dolly (EIR)
410 Frankton Rd.
Hood River, OR 97031-9737
Gold
Moose Creek
Bonnifield district

Schnabel, Erma L. (SER)
PO Box 149
Haines, AK 99827-0149
Gold
Porcupine Creek
Juneau district

Schnabel, John J. (SER)
PO Box 149
Haines, AK 99827-0149
Gold
Porcupine Creek
Juneau district

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

Sebens, Mark W. (SER)
PO Box 1107
Haines, AK 99827-1107
Gold
Porcupine Creek
Juneau district

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

Seuffert Sr., George W. (EIR)
8191 E Del Joya Dr.
Scottsdale, AZ 85258-2337
Gold
Chicken Creek
Fortymile district

Shafer, Marion H. (EIR)
PO Box 21755
Juneau, AK 99802-1755
Gold
Ready Bullion Creek
Fairbanks district

Shilling, John A. (EIR)
924 W Chestnut St.

Houston, MO 65483-1820
Gold
Thanksgiving Creek
Hot Springs district

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

Simmons, Shianne (EIR)
PO Box 56331
North Pole, AK 99705-1331
Gold
Walker Fork
Fortymile district

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

Skidmore Jr., Samuel C. (EIR)
PO Box 70470
Fairbanks, AK 99707-0470
Gold
Vault Creek
Fairbanks district

Skidmore, Donna G. (EIR)
PO Box 70470
Fairbanks, AK 99707-0470
Gold
Vault Creek
Fairbanks district

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

Smith Jr., David B. (EIR)
3525 Holt Road
Fairbanks, AK 99701-7411
Gold
Deadwood Creek
Circle district

Smith Jr., David B. (EIR)
3525 Holt Road
Fairbanks, AK 99701-7411
Gold
Deadwood Creek
Circle district

Smith Sr., David B. (EIR)
9235 W Harbor Isle Ct.
Crystal River, FL 34429-5355
Gold
Deadwood Creek
Circle district

Smith, Lynda K. (SCR)
PO Box 681

Cooper Landing, AK 99572
Gold
None
Seward district

Smith, Sherman C. (SCR)
PO Box 770
Cooper Landing, AK 99572-0770
Gold
None
Seward district

Smith, Stephen J. (EIR)
6160 W Baghdad St.
Dunnellon, FL 34433-6512
Gold
Deadwood Creek
Circle district

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

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

Spurlock, Taylor (WR)
43445 Business Park Dr. #113
Temecula, CA 92590-3671
Gold
Cripple River
Nome district

Stardust Mining Inc. (EIR)
142 Steelhead Rd.
Fairbanks, AK 99709-3041
Gold
Colorado Gulch
Hot Springs district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
550 W 7th Ave. #900b
Anchorage, AK 99501-3577
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way

Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

State of Alaska (WR)
Division of Mining, Land & Water
3700 Airport Way
Fairbanks, AK 99707-4699
Gold
Norton Sound
Nome district

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

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

Stein, Evelyn J. (EIR)
105 Dunbar Ave.
Fairbanks, AK 99701-3658
Gold
Gilmore Creek
Fairbanks district

Stepp, Vernon E. (EIR)
290 Pearl Dr.
Fairbanks, AK 99712
Gold
Bottom Dollar Creek
Circle district

Sternberg, Thomas H. (SCR)
3154 E 19th Ct.
Anchorage, AK 99508-3383
Gold
Quartz Creek
Hope district

Sternberg, Thomas H. (SCR)
3154 E 19th Ct.
Anchorage, AK 99508-3383
Gold
Quartz Creek
Hope district

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

Stone, James T. (EIR)
PO Box 110842
Anchorage, AK 99511-0842
Gold
Porcupine Creek
Circle district

Stone, L.F. (EIR)
8196 East Cooper Lane
Floral City, FL 34436-2710
Gold
Deadwood Creek
Circle district

Strandberg Jr., Sigvald J. (WR)
PO Box 85125
Fairbanks, AK 99708
Gold
Crescent Creek
Innoko district

Strandberg Sr., Sigvald J. (WR)
PO Box 80787
Fairbanks, AK 99708
Gold
Crescent Creek
Innoko district

Strandberg, Neil M. (WR)
PO Box 80787
Fairbanks, AK 99708
Gold
Crescent Creek
Innoko district

Stringfellow, JoAnn (EIR)
3051 Central Blvd.
Milford, MI 48380-2205
Gold
Jack Wade Creek
Fortymile district

Stringfellow, Ron (EIR)
3051 Central Blvd.
Milford, MI 48380-2205
Gold
Jack Wade Creek
Fortymile district

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

Sweetsir, Michael A.
PO Box 51
Ruby, AK 99768
Gold
Glen Gulch
Ruby district

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

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

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

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

Tallini, Roger P. (EIR)
PO Box 3474
Flagstaff, AZ 86003-3474
Gold
Fortymile River
Fortymile district

Tatlow, Carl (SCR)
PO Box 1621
Palmer, AK 99645-1621
Gold
Peters Creek
Yentna district

Tatlow, Janice L. (SCR)
PO Box 1621
Palmer, AK 99645
Gold
Peters Creek
Yentna district

Taylor, June M. (EIR)
PO Box 101

Eagle, AK 99738-0101
Gold
Fortymile River
Fortymile district

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

Tengs, Martin A. (SER)
PO Box 148
Haines, AK 99827-0148
Gold
Porcupine Creek
Juneau district

Teryl Resources Corp. (EIR)
185-10751 Shellbridge Way
Richmond, B.C. V6X 2W8
Canada
Gold
Gilmore Creek
Fairbanks district

This Corporation (WR)
8916 Windwood St.
Wichita, KS 67226
Gold
Offshore
Nome district

Thomas, Scott A. (EIR)
663 Tonsina Dr.
Fairbanks, AK 99712-2038
Gold
Half Dollar Creek
Circle district

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

Thurman Oil and Mining Inc. (EIR)
925 Aurora Dr.
Fairbanks, AK 99709-5506
Gold
Smallwood Creek
Fairbanks district

Thurman, James L. (EIR)
925 Aurora Dr.
Fairbanks, AK 99709-5538
Gold
Goldstream Creek
Fairbanks district

Thurman, Leta (EIR)
925 Aurora Dr.
Fairbanks, AK 99709-5538
Gold
Goldstream Creek
Fairbanks district

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

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

Titchenal, Robert L. (SCR)
4501 Montrose Cir.
Anchorage, AK 99515-1138
Gold
Busch Creek
Valdez Creek district

Toohey, Camden W. (SCR)
PO Box 113
Girdwood, AK 99587-0113
Gold
Crow Creek
Anchorage district

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

Toohey, Sean (SCR)
PO Box 113
Girdwood, AK 99587-0113
Gold
Crow Creek
Anchorage district

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

Tuluksak Dredging Ltd. (SWR)
1634 W 13th Ave.
Anchorage, AK 99501-4217
Gold
Spruce Creek
Aniak district

Turner, Wallace O. II, (EIR)
546 Wilcox Ave.
Fairbanks, AK 99709-3624
Gold
Moose Creek
Bonnifield district

Twogood, Dorothy (EIR)
PO Box 60203
Fairbanks, AK 99706-0203
Gold
Goldstream Creek
Fairbanks district

Twogood, Ron (EIR)
PO Box 60203
Fairbanks, AK 99706-0203
Gold
Goldstream Creek
Fairbanks district

Vander Wal, Jon (EIR)
E 171 Cranberry Creek Rd.
Shelton, WA 98584-7527
Gold
Marguerite Creek
Bonnifield district

Vetter, Adolph, Estate of (EIR)
PO Box 70342
Fairbanks, AK 99707-0342
Gold
Gilmore Creek
Fairbanks district

Vetter, Adolph, Estate of (EIR)
PO Box 70342
Fairbanks, AK 99707-0342
Gold
Wolf Creek
Fairbanks district

Vetter, Rudolph (EIR)
PO Box 70342
Fairbanks, AK 99707-0342
Gold
Wolf Creek
Fairbanks district

Vial, D.B. (WR)
10508 Fawn Dr. NW
Gig Harbor, WA 98332-9510
Gold
Candle Creek
Fairhaven district

Vial, Michael L. (WR)
PO Box 292
Willow, AK 99688-0292
Gold
Candle Creek
Fairhaven district

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

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

Vogt, Ray A. (EIR)
4200 Old Elliott Hwy
Unit 8 Box 10
Fairbanks, AK 99712-1073
Gold
Dome Creek
Fairbanks district

Vournas, George (SCR)
c/o Philip Brandl
14251 Sabine St.
Anchorage, AK 99516-3912
Gold
Cache Creek
Yentna district

Vournas, George (SCR)
c/o Philip Brandl
14251 Sabine St.
Anchorage, AK 99516-3912
Gold
Cache Creek
Yentna district

Vournas, George (SCR)
c/o Philip Brandl
14251 Sabine St.
Anchorage, AK 99516-3912
Gold
Cache Creek
Yentna district

Walsh, Daniel P. (WR)
PO Box 61098
Fairbanks, AK 99706-1098
Gold
Dexter Creek
Nome district

Walsh, Daniel P. (WR)
PO Box 61098
Fairbanks, AK 99706-1098
Gold
Dry Creek
Nome district

Walsh, Paul (WR)
PO Box 61098
Fairbanks, AK 99706-1098
Gold
Dexter Creek
Nome district

Walsh, Paul (WR)
PO Box 61098
Fairbanks, AK 99706-1098
Gold
Dry Creek
Nome district

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

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

Weathers, Edith (SCR)
PO Box 8082
Nikiski, AK 99635-8082
Gold
Cache Creek
Yentna district

- Whitten III, Fred J. (NR)**
269 Madcap Ln.
Fairbanks, AK 99709-6568
Gold
Mailbox Creek
Koyukuk district
- Whitten, Fred J. Jr., (NR)**
269 Madcap Ln.
Fairbanks, AK 99709-6568
Gold
Mailbox Creek
Koyukuk district
- Wicken, James T. (NR)**
1709 Central Ave.
Fairbanks, AK 99709-4220
Gold
Gold Creek
Koyukuk district
- Wigger, Walter P. (EIR)**
PO Box 70078
Fairbanks, AK 99707-0078
Gold
Ester Creek
Fairbanks district
- Wiggers, Dan Sr., Estate of (NR)**
HC 30 Box 5382
Wasilla, AK 99654-9712
Gold
Hammond River
Koyukuk district
- Wiggers, Dean R. (NR)**
PO Box 870224
Wasilla, AK 99687-0224
Gold
Hammond River
Koyukuk district
- Wilder, Karen (EIR)**
107 7th Ave. #2
Fairbanks, AK 99701-5063
Gold
Little Boulder Creek
Hot Springs district
- Wilder, Richard (EIR)**
107 7th Ave. #2
Fairbanks, AK 99701-5063
Gold
Little Boulder Creek
Hot Springs district
- Wilkinson, Fred D. (EIR)**
PO Box 72702
Fairbanks, AK 99707-2702
Gold
Ketchum Creek
Circle district
- Wilkinson, Fred D. (EIR)**
PO Box 72702
Fairbanks, AK 99707-2702
Gold
Porcupine Creek
Circle district
- Willard, Gerald L. (SCR)**
PO Box 875532
Wasilla, AK 99687-5532
Gold
Bear Creek
Hope district
- Willford, Frank E. (EIR)**
PO Box 487
Cocolalla, ID 83813-0487
Gold
Woodchopper Creek
Hot Springs district
- Williams, Michael A. (EIR)**
PO Box 603
Tok, AK 99780-0603
Gold
Kenyon Creek
Fortymile district
- Wolf, Ray D. (EIR)**
30033 Redwood Hwy.
Cave Junction, OR 97523-9360
Gold
Harrison Creek
Circle district
- Wolff, Flint (EIR)**
PO Box 56331
North Pole, AK 99705-1331
Gold
Walker Fork
Fortymile district
- Wolff, Margaret (EIR)**
PO Box 56331
North Pole, AK 99705-1331
Gold
Walker Fork
Fortymile district
- Wolff, Timber (EIR)**
Box Bya Boundary
Tok, AK 99780
Gold
Walker Fork
Fortymile district
- Wolters, Morris (EIR)**
622-E, SR 4
Cathlamet, WA 98612
Gold
Crooked Creek
Circle district
- Wood, James L. (EIR)**
13302 Half S Bridge Ave.
Yuma, AZ 85365-9772
Gold
Little Boulder Creek
Hot Springs district
- Wrede, Ronald J. (EIR)**
2116 NE 80th St.
Seattle, WA 98115-4538
Gold
Switch Creek
Circle district
- Wright Jr., Robert P. (EIR)**
PO Box 60783
Fairbanks, AK 99706-0783
Gold
Last Chance Creek
Fairbanks district
- Wright, Richard L. (NR)**
3910 Tilleson Way
North Pole, AK 99705-6555
Gold
Gold Creek
Koyukuk district
- Wright, Richard L. (NR)**
3910 Tilleson Way
North Pole, AK 99705-6555
Gold
Gold Creek
Koyukuk district
- Wyrick, L.E. (SWR)**
PO Box 782
Willow, AK 99688-0782
Gold
Granite Creek
Aniak district
- Wyrick, Marilyn A. (SWR)**
PO Box 782
Willow, AK 99688-0782
Gold
Granite Creek
Aniak district
- Yellow Eagle Mining, Inc. (EIR)**
PO Box 80566
Fairbanks, AK 99708
Gold
Ester Creek
Fairbanks district
- Yoder, Dale E. (EIR)**
PO Box 70529
Fairbanks, AK 99709-0529
Gold
Goldstream Creek
Fairbanks district
- Yoder, Darlene (EIR)**
PO Box 70529
Fairbanks, AK 99709-0529
Gold
Goldstream Creek
Fairbanks district
- Yoder, Paul (EIR)**
PO Box 70529
Fairbanks, AK 99709-0529
Gold
Goldstream Creek
Fairbanks district
- Young, Edward J. (EIR)**
1303 W 33rd Ave. Ste. 200
Anchorage, AK 99503-3634
Gold
Specimen Creek
Delta River district
- Zimmer, George W. (SCR)**
PO Box 572
Cooper Landing, AK 99572-0572
Gold
Quartz Creek
Seward district
- Zimmer, Lillian L. (SCR)**
PO Box 572
Cooper Landing, AK 99572-0572
Gold
Quartz Creek
Seward district
- Zimmerman, Charles J. (EIR)**
PO Box 41
Manley Hot Springs, AK 99756
Gold
Killarney Creek
Hot Springs 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).
 Bogan Mountain, 122, (fig. D-3).
 Bonanza Creek, 45, (fig. D-2).
 Bond Creek, 73, (fig. D-2).
 Bonfield 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, 49c, (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).
 Kaska 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).

^aThis 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.

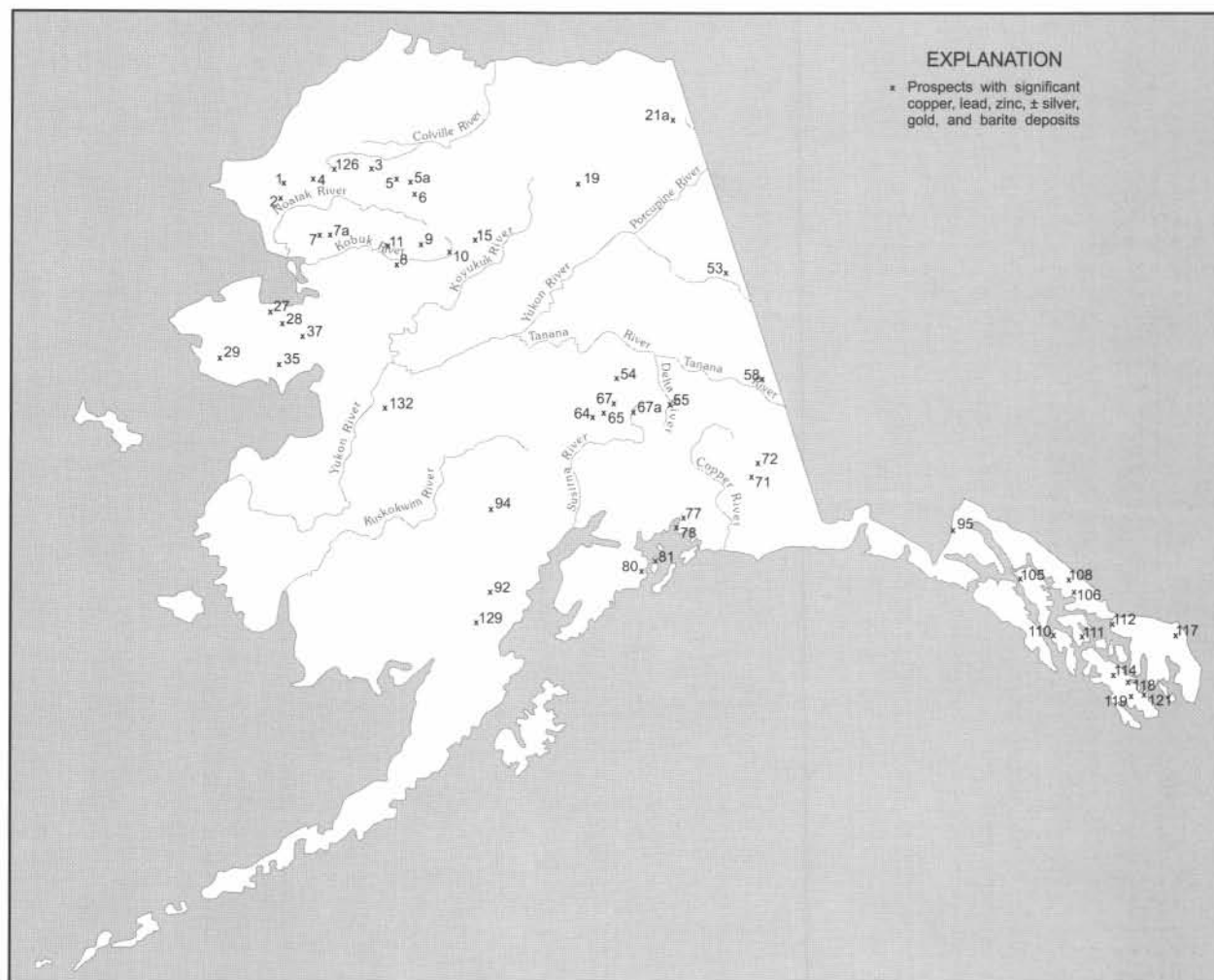


Figure D-1. Significant copper, lead, zinc with credits of silver, gold, and barite deposits in Alaska, 1999.

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 three major stratabound massive sulfide deposits hosted in Pennsylvanian or Mississippian shale; similar to locality 1. (a) The Main deposit at Red Dog contains 52.5 million tons of measured and indicated ore grading 19.2% Zn, 5.2% Pb, with 3.2 oz/ton Ag. (b) The Aqqaluk deposit contains 80.4 million tons grading 13.6% Zn, 3.7% Pb, and 2.1 oz/ton Ag. (c) The Hilltop deposit with an indicated reserve is 10.6 million tons grading 17.8% Zn, 5.5% Pb, and 3.8 oz/ton Ag. (d) Inferred resource in the Paalaaq deposit is 14.3 million tons of 15.0% Zn, 4.0% Pb, and 2.9 oz/ton Ag. (e) Anarraq deposit discovered in 1999 (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 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

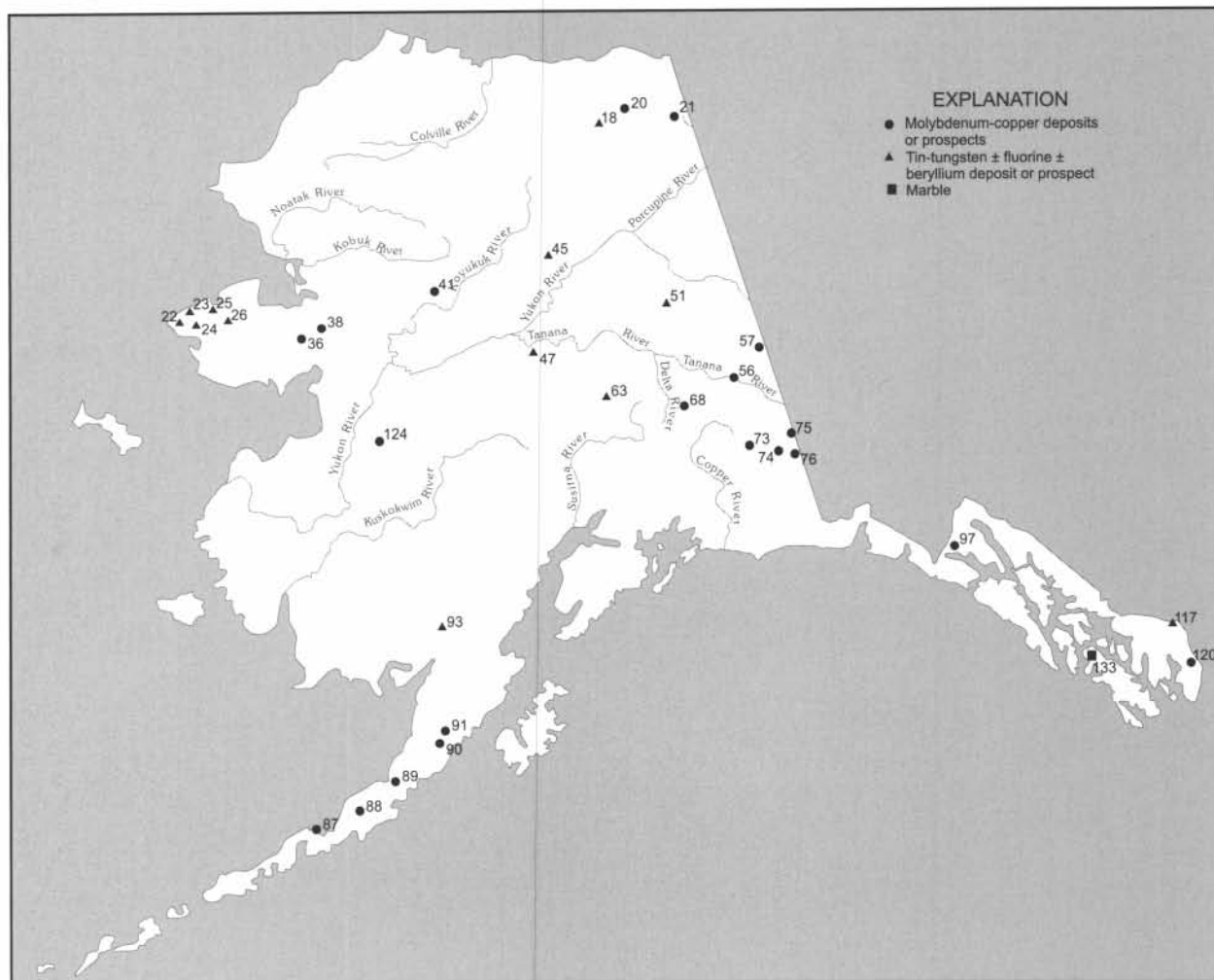


Figure D-2. Significant molybdenum-copper and tin-tungsten with credits of fluorite and beryllium deposits in Alaska, 1999.

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 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).

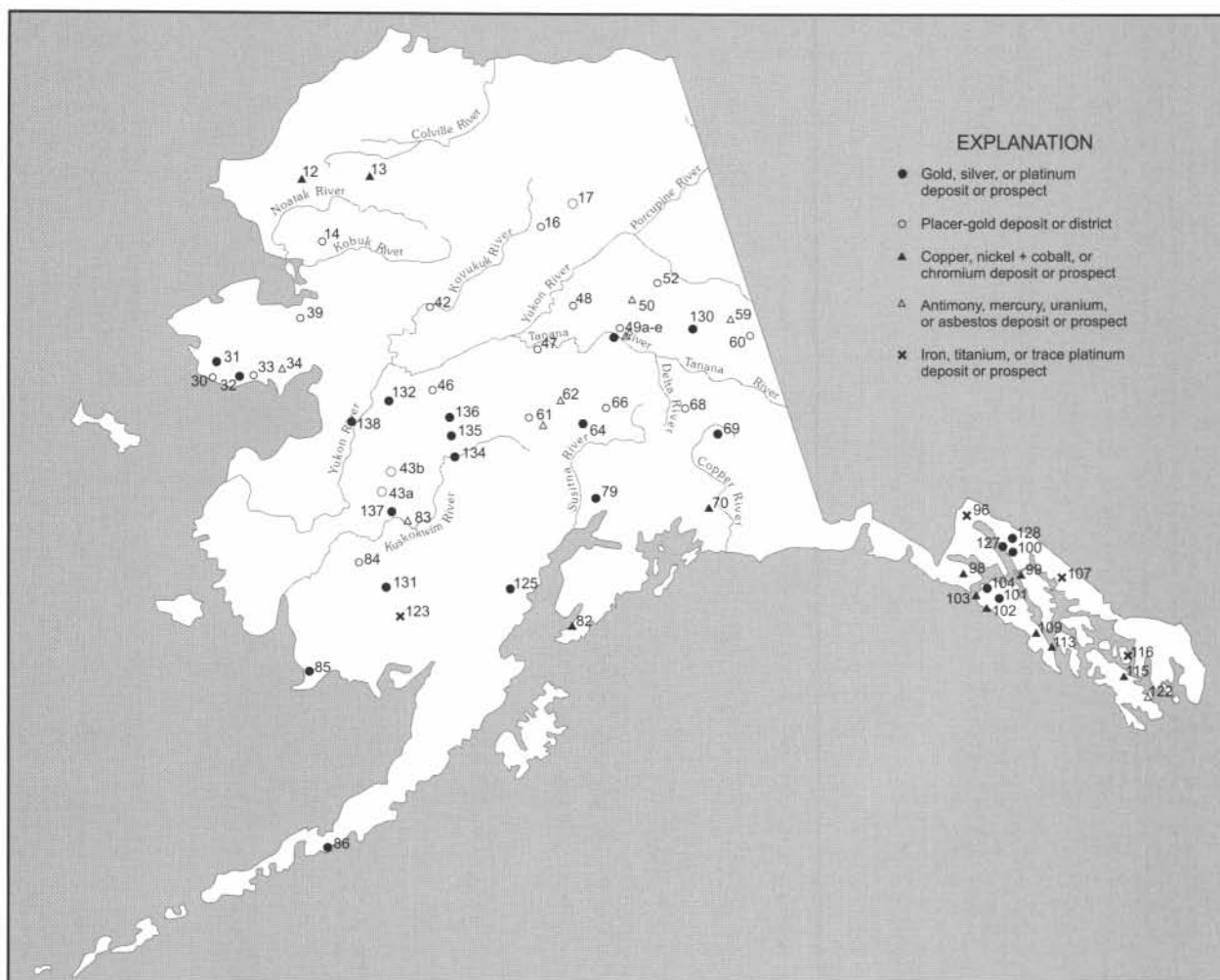


Figure D-3. Significant gold, silver, platinum, and strategic mineral deposits in Alaska, 1999.

- 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 argentiiferous 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 **Omaliik**—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 4 million lb 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, 1999, open at depth, are 2,968,000 oz of Au in 123.31 million tons of rock at an average Au grade of 0.024 oz/ton. Possible reserves of 7.78 million tons at an average grade of 0.023 oz/ton Au (176,000 oz of Au) and a resource of 63.71 million tons at an average grade of 0.0225 oz/ton Au (1,422,000 oz of Au). The total gold resource at Fort Knox is 4.57 million oz of Au. Fairbanks Gold Mining Inc. mined 702,295 oz in 1996, 1997, and 1998 at a cash cost of \$170/oz to \$189/oz (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 5 million lb 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 3.5 million lb 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 42,000 lb 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 **Denali Prospect**—At least six small, stratabound Cu lodes in volcanic sedimentary rocks of Triassic age that may contain 5 million tons ore that grade about 2% Cu with credits of Ag (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 1.2 billion lb 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 3.3 million lb 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 16 million lb 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 205 million lb 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% Cr₂O₃ (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 yd³ of deep, PGE-bearing gravels remain. Lode source believed to be Alaskan-type zoned

- ultramafic complex of Jurassic 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 **Sleit Mountain**—High-grade east-west-trending, Sn-W-Ag topaz-quartz greisen system hosted in 59-million-year-old binary 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 128 to 212 million lb 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 0.67% 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 28 million lb 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, 5 million lb 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 10 million lb 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% MoS₂, and possible reserves are 1.2 billion tons with 0.12% MoS₂ (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 1.4 million lb 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. The deposit is open to expansion (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% U₃O₈. 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% TiO₂, and 0.16% P₂O₅ (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 volcanoclastic, 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 antiformal. Drilling has identified 13 million tons of chemically homogeneous, 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**—Intrusive-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 resources of 14.35 million tons grading 0.067 oz/ton, 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; 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 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. The 1998 core drilling program increased the overall gold resource to 11.5 million oz of Au, with a measured and indicated resource of 5.4 million oz of Au contained in 62.8 million tons of ore grading 0.0876 oz/ton Au (fig. D-3).
- 138 **Kaiyah**—Au–Ag epithermal prospect in silicified Koyukuk sedimentary rocks adjacent to Poison Creek caldera. Quartz veins, some over 100 feet thick, and silicification are associated with pervasive alunite, jarosite, and sericite alteration (fig. D-3).

APPENDIX E

State and federal agencies and private interest groups involved in mineral development activities, 1999

(Note: The 1998 Service Directory of the Alaska Miners Association lists technical and professional consultants and companies available for work in Alaska. The report is available for \$15 from the Association's Anchorage office.)

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. Unit 7, 3677 College Rd.
333 Willoughby Ave. Fairbanks, AK 99709
P.O. Box 110804 (mailing) (907) 451-3050
Juneau, AK 99811-0804 (907) 451-3053 (fax)
(907) 465-2017 email: swainbnk@ptialaska.net
(907) 465-3767 (fax)
<http://www.dced.state.ak.us/cbd/>
email: frankie_pillifant@dced.state.ak.us

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.

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

410 Willoughby Ave., Ste. 105
Juneau, AK 99801-1795
(907) 465-5010 (907) 465-5097 (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 TTY
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
http://www.state.ak.us/local/akpages/FISH.GAME/habitat/hab_home.htm

Habitat and Restoration Division
(907) 465-4105

Function: Protects habitat in fish-bearing fresh waters and manages refuges, sanctuaries, and critical habitats. Requires permits for any work involving: the blockage of fish passage; equipment crossings or operation in fresh waters used by anadromous fish; use, diversion, or pollution of streams containing anadromous fish; construction, exploration, or development work in state game refuges, game sanctuaries, and critical habitat areas.

Northern Regional Office
Habitat and Restoration
1300 College Rd.
Fairbanks, AK 99701-1599
(907) 459-7289

Southcentral Regional Office
Habitat and Restoration
333 Raspberry Rd.
Anchorage, AK 99518-1599
(907) 267-2285

Southeastern Regional Office
Habitat and Restoration Division
802 3rd St., 2nd Fl.
P.O. Box 240020 (mailing)
Douglas, AK 99824-0020
(907) 465-4290

OFFICE OF MANAGEMENT AND BUDGET

Division of Governmental Coordination
240 Main St., Ste. 500
P.O. Box 110030 (mailing)
Juneau, AK 99811-0030
(907) 465-3562

Function: Conducts coordinated State review of permits for mining projects within Alaska's Coastal Management Zone. Provides project design information to applicants for consistency with the policies and standards of the Alaska Coastal Management Program. Coordinates State response to direct federal actions, including proposed regulations, that affect Alaska's mining industry.

Southcentral Regional Office
550 W. 7th St., Ste. 1660
Anchorage, AK 99501-3568
(907) 269-7470 (907) 269-3981 (fax)

DEPARTMENT OF NATURAL RESOURCES

400 Willoughby Ave., 5th Fl.
Juneau, AK 99801-1724
(907) 465-2400
<http://www.dnr.state.ak.us>

Division of Forestry

550 W. 7th Ave., Ste. 1450
Anchorage, AK 99501
(907) 269-8463
<http://www.dnr.state.ak.us/forestry>

Function: Establishes guidelines to manage mining in state forests.

Interior Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2660

Coastal Regional Office
400 Willoughby Ave., 3rd Fl.
Juneau, AK 99801-1724
(907) 465-2491

Division of Geological & Geophysical Surveys

794 University Ave., Ste. 200
Fairbanks, AK 99709-3645
(907) 451-5000 (907) 451-5050 (fax)
email: dggs@dnr.state.ak.us
<http://www.dggs.dnr.state.ak.us>

Function: Conducts geological and geophysical surveys to determine the potential of Alaska land for production of metals, minerals, fuels, and geothermal resources; locations and supplies of construction materials; potential geologic hazards to buildings, roads, bridges, and other installations and structures; and other surveys and investigations as will advance knowledge of the geology of Alaska and general geologic inventories. Publishes a variety of reports that contain the results of these investigations. Advises the public and government agencies on geologic issues. Maintains a library of geologic bulletins, reports, and periodicals. Maintains a geologic materials storage facility at Eagle River.

Geologic Materials Center
P.O. Box 772805
Eagle River, AK 99577-2805
(907) 696-0079 (907) 696-0078 (fax)

Division of Mining, Land & Water

550 W. 7th Ave., Ste. 1070
Anchorage, AK 99501
(907) 269-8600 (907) 269-8904 (fax)
<http://www.dnr.state.ak.us>

A. Mining

Function: Principal agency for management of mining and reclamation on state land in Alaska. Maintains a mining office in Fairbanks. Issues property rights to leasable minerals; manages locatable mineral filings. Issues permits for hard-rock and placer-mining activity. Maintains records of mineral locations, permits, and leases. Provides technical, legal, and land-status information. Administers the Alaska Surface Mining Control and Reclamation Act (ASMCRA), which includes permitting and inspection of coal mining activity and reclamation of abandoned mines.

B. Land

Function: Manages surface estate and resources, including materials (gravel, sand, and rock). Handles statewide and regional land-use planning. Issues leases, material-sale contracts, mill-site leases, land-use permits, and easements for temporary use of State land and access roads. Administers land sales program.

C. Water Management

Function: Manages water resources of the state; issues water-appropriation permits and certificates; responsible for safety of all dams in Alaska; conducts surveys to determine the locations, quantity, and quality of ground and surface water.

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2700
(907) 451-2751 (fax)

Southcentral Regional Office
550 W. 7th Ave., Ste. 900A
Anchorage, AK 99501
(907) 269-8503
(907) 269-8947 (fax)

Southeastern Regional Office
400 Willoughby Ave., 4th Fl.
Juneau, AK 99801-1724
(907) 465-3400

(907) 586-2954 (fax)

Division of Parks and Outdoor Recreation

550 W. 7th Ave., Ste. 1310
Anchorage, AK 99501
(907) 269-8700

Function: Manages approximately 3,000,000 acres of state park lands primarily for recreational uses, preservation of scenic values, and watershed. Responsible for overseeing mining access, recreational mining activity, and valid mining-claim holdings within state park lands. The Office of History and Archaeology reviews mining permit applications on all lands within the state for impacts to historic resources.

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2695

Southeastern Regional Office
400 Willoughby Ave., 4th Fl.
Juneau, AK 99801-1724
(907) 465-4563

Office of History and Archaeology
550 W. 7th Ave., #1310
Anchorage, AK 99501
(907) 269-8721
email: michelej@dnr.state.ak.us

DEPARTMENT OF PUBLIC SAFETY

450 Whittier St.
P.O. Box 111200 (mailing)
Juneau, AK 99811-1200
(907) 465-4322

Division of Fish and Wildlife Protection

5700 East Tudor Rd.
Anchorage, AK 99507-1225
(907) 269-5509

Function: Enforces state laws, in particular AS Title 16. Protects Alaska's fish and wildlife resources through enforcement of laws and regulations governing use of natural resources within Alaska. These laws are in Alaska Statutes 8, 16, 46, and Alaska Administrative Codes 5, 12, and 20.

DEPARTMENT OF REVENUE

State Office Bldg.
11th Fl., Entrance A
P.O. Box 110400 (mailing)
Juneau, AK 99811-0400
(907) 465-2300
<http://www.revenue.state.ak.us>

Tax Division

State Office Bldg., 11th Fl., Entrance B
P.O. Box 110420 (mailing)

Juneau, AK 99811-0420
 (907) 465-2320 (907) 465-2375 (fax)
 email: fish_excise@revenue.state.ak.us
 http://www.revenue.state.ak.us/iea/

Function: Issues licenses for mining, production, and sale of minerals. Administers mining-license tax based on net income, including royalties. New mining operations—except sand and gravel mining—can apply for and receive certificates of tax exemption for the first 3½ years of operation. (Tax returns must be filed annually.)

UNIVERSITY OF ALASKA

College of Science, Engineering, and Mathematics

Department of Geology & Geophysics
 308 Natural Sciences Bldg.
 University of Alaska Fairbanks
 Fairbanks, AK 99775-5780
 (907) 474-7565 (907) 474-5163 (fax)
 email: geology@zorba.uafadm.alaska.edu
 http://www.uaf.edu/geology

Function: Provides undergraduate and graduate education in geology and geophysics and conducts basic and applied research in geologic sciences. Offers B.S., M.S., and Ph.D. program options in general geology, economic geology, petroleum geology, geophysics, and ice-snow-permafrost geophysics.

School of Mineral Engineering

P.O. Box 755960
 Brooks Building - Rm. 209
 University of Alaska Fairbanks
 Fairbanks, AK 99775-5960
 (907) 474-7366 (907) 474-6994 (fax)
 email: FYSME@uaf.edu
 http://sme.uaf.edu

Function: Provides undergraduate and graduate education programs in geological engineering, mining engineering, mineral preparation engineering, and petroleum engineering. Through research programs conducts laboratory and field studies to promote mineral and energy development.

Mineral Industry Research Laboratory (MIRL)

School of Mineral Engineering
 O'Neill Resources Bldg., Rm. 229
 University of Alaska Fairbanks
 Fairbanks, AK 99775-7240
 (907) 474-6746 (907) 474-5400 (fax)

Function: Conducts applied and basic research in exploration, development, and utilization of Alaska's mineral and coal resources with emphasis on coal characterization, coal utilization, coal upgrading, coal preparation, mineral beneficiation, fine gold recovery, hydrometallurgy, and environmental concerns. Publishes reports on research results and provides general information and assistance to the mineral industry.

Mining Extension Program

Duckering Bldg., Rm. 401
 University of Alaska Fairbanks
 Fairbanks, AK 99775-5800
 (907) 474-7702

Function: Offers prospecting and introductory mineral and mining courses under an open admissions policy.

Mining and Petroleum Training Service

155 Smith Way, Ste. 101

University of Alaska Anchorage
 Soldotna, AK 99669
 (907) 262-2788

Function: Provides direct training and assistance to mine operators, service and support companies, and governmental agencies in mine safety and health, mining extension, vocational mine training, and technical transfer. Specialized training services in hazardous materials, first aid and CPR, industrial hygiene, and professional safety education and consulting are available on demand.

FEDERAL AGENCIES

U.S. DEPARTMENT OF THE INTERIOR

Office of the Secretary
 1689 C St., Ste. 100
 Anchorage, AK 99501-5151
 (907) 271-5485
 (907) 271-4102

Function: Coordinates the Department of the Interior's policy and stewardship with DOI bureaus for the management of over 200 million acres of public land in Alaska.

Bureau of Land Management

Alaska State Office
 Division of Lands, Minerals, and Resources
 222 West 7th Ave., Ste. 13
 Anchorage, AK 99513-7599
 (907) 271-5477
 Lands & Minerals Group (907) 271-5049
 Public Land Information Center (907) 271-5960
 Anchorage Mineral Resources Team (907) 271-2454
 http://www.ak.blm.gov/

Function: Surface manager of federal public lands (except national parks, wildlife refuges, national monuments, national forests, and military withdrawals). Performs a variety of land administration functions for federal lands. Responsible for many minerals functions on federal lands, including issuing leases for all federal leasable minerals including oil and gas, coal, phosphates, and oil shale. Arranges for sale of minerals other than leasable or materials, such as sand, gravel, or stone. Issues rights-of-way and special use permits. Monitors mining operations to ensure protection of surface resources. Maintains land status plats and issues patents. Records federal mining claims and annual assessment affidavits, and collects annual claim holding fees.

The Anchorage and Juneau Mineral Resources Teams conduct studies that aid environmentally sound development of a viable mineral industry in Alaska. Emphasis is on field programs that identify the type, amount, and distribution of mineral deposits in Alaska. The field information is augmented by studies of beneficiation technologies, economic feasibility, and economic and environmental effects of mineral development. Information is provided to government agencies to aid land-planning and land-use decisions, and to the private sector to identify targets of opportunity for further exploration and/or development.

Anchorage Field Office
 6881 Abbott Loop Rd.
 Anchorage, AK 99507-2599
 (907) 267-1246
 (907) 267-1267 (fax)

Glennallen Field Office
 P.O. Box 147
 Glennallen, AK 99588
 (907) 822-3217
 (907) 822-3120 (fax)

Juneau Mineral Information Center
 Juneau Mineral Resources Team
 100 Savikko Rd.

Mayflower Island
Douglas, AK 99824
(907) 364-1553
email: jalbrech@ak.blm.gov
<http://juneau.ak.blm.gov>

Function: Conducts mineral assessment and economic engineering and environmental studies primarily on federal lands. Library contains 20,000 geologic and minerals publications and provides a variety of on-line land status and mineral information services.

Kotzebue Field Station
P.O. Box 1049
Kotzebue, AK 99752-1049
(907) 442-3430
(907) 442-2720 (fax)

Nome Field Office
P.O. Box 925
Nome, AK 99762-0925
(907) 443-2177
(907) 443-3611 (fax)

Northern Field Office
1150 University Ave.
Fairbanks, AK 99709-3899
(907) 474-2200
(907) 474-2251 Public Room
1-800-437-7021

U.S. Fish and Wildlife Service

Region 7 Office
1011 East Tudor Rd.
Anchorage, AK 99503
(907) 786-3542
<http://www.r7.fws.gov/>

Function: Administers the federal public lands in national wildlife refuges, issues special-use permits for activities on refuges, reviews permits and applications for various mining activities on all private and public lands and waters, and provides information to regulatory agencies on fish and wildlife and their habitat. Makes recommendations to regulatory agencies to mitigate adverse environmental impacts.

U.S. Fish and Wildlife Service
Fairbanks Ecological Services
101 12th Ave., Rm. 110
Box No. 19
Fairbanks, AK 99701
(907) 456-0327
(907) 456-0208 (fax)

U.S. Fish and Wildlife Service
Juneau Fish and Wildlife
Service Office
3000 Vintage Blvd., Ste. 201
Juneau, AK 99801-7100
(907) 586-7240
(907) 586-7154 (fax)

U.S. Fish and Wildlife Service
Anchorage Field Office
605 West 4th Ave., Rm. G-62
Anchorage, AK 99501
(907) 271-2888

(907) 271-2786 (fax)

U.S. Geological Survey

Geological Division
4200 University Dr.
Anchorage, AK 99508-4663
(907) 561-1181

Function: Investigates and reports on the occurrence, quality, quantity, and environmental characteristics of mineral resources, the processes that create and modify them, models for assessing mineral endowment, and the potential impacts of mineral development. A major aspect of this research involves 1:250,000-scale geologic mapping.

Water Resources Division
4230 University Dr., Ste. 201
Anchorage, AK 99508-4664
(907) 786-7100

U.S. Geological Survey Earth Science Information Center
National Mapping Division
4230 University Dr., Ste. 101
Anchorage, AK 99508-4664
(907) 786-7011

Function: Publishes and distributes all available topographic maps of Alaska, digital products, and aerial photography.

National Park Service

Alaska Regional Office
Physical Resources
2525 Gambell St.
Anchorage, AK 99503-2892
(907) 257-2632 (907) 257-2448 (fax)

Function: Administers lands within the national park system in Alaska. Manages oil and gas operations and pre-existing valid mining claims in parklands through plans of operation under Mining in Parks Act, National Park Service regulations, and other applicable federal and state laws and regulations.

U.S. DEPARTMENT OF LABOR

Mine Safety and Health Administration

205 N. 4th St.
Coeur d'Alene, ID 83814-2877
(208) 667-6680 (208) 765-3099 (fax)

Mine Safety and Health Administration

Anchorage Federal Building
US Courthouse - Rm. 126
222 West 7th Ave., Box 30
Anchorage, AK 99513
(907) 271-1250 (907) 271-1252 (fax)
email: osborn-russell@msha.gov

Function: Administers health and safety standards to protect the health and safety of metal, nonmetal, and coal miners. Co-operates with the State to develop health and safety programs and develops training programs to help prevent mine accidents and occupationally caused diseases. Under agreement with the Coal Mine Safety and Health Office, the MSHA metal/nonmetal section has assumed responsibility for enforcement and training activities at coal mines in Alaska.

Mine Safety and Health Administration

Coal Mine Safety and Health, District 9
P.O. Box 25367
Denver, CO 80225
(303) 231-5458 (303) 231-5553 (fax)
<http://www.msha.gov>

Function: Administers health and safety standards according to the Code of Federal Regulations to protect the health and safety of coal miners; requires that each operator of a coal mine comply with these standards. Cooperates with the State to develop health and safety programs and develops training programs to help prevent coal or other mine accidents and occupationally caused diseases in the industry.

U.S. DEPARTMENT OF AGRICULTURE

Forest Service

Regional Office, Federal Bldg.
P.O. Box 21628
Juneau, AK 99802-1628
(907) 586-7869 (907) 586-7866 (fax)
email: jkato@fs.fed.us
<http://www.fs.fed.us/>
<http://www.fs.fed.us/r10/>

Function: With the Bureau of Land Management, provides joint administration of general mining laws on national forest system lands. Cooperates with Department of Interior agencies in the review and issuance of mineral leases. Issues permits for disposal of sand, gravel, and stone.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10 Regional Office
1200 6th Ave., MS OW-130
Seattle, WA 98101
(206) 553-1200
(206) 553-1746 (NPDES permits)
<http://www.epa.gov/rioearth/>

Function: Issues National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act to regulate effluent discharges. Implements a compliance enforcement program. Maintains regulatory and review authority over wetland and NEPA/EIS-related issues.

Alaska Operations Office
222 West 7th Ave., Rm. 537
222 W. 7th Ave., Box 19 (mailing)
Anchorage, AK 99513-7588
(907) 271-5083

Alaska Operations Office
Ste. 100
410 Willoughby Ave.
Juneau, AK 99801
(907) 586-7619

U.S. DEPARTMENT OF THE ARMY

Corps of Engineers

Regulatory Branch
Attention: CEPOA-CO-R
P.O. Box 898

Anchorage, AK 99506-0898

(907) 753-2712

(907) 753-2716 (fax)

(800) 478-2712 (in Alaska only)

Function: Regulates structures or work in navigable waters of the U.S. and discharge of dredged or fill material into U.S. waters, including wetlands. Examples of regulated mining activities include construction of berms, dikes, diversions, ponds, overburden stripping, stockpiling, and reclamation activities.

COOPERATIVE STATE-FEDERAL AGENCIES

Alaska Public Lands Information Center

250 Cushman St., Ste. 1A

Fairbanks, AK 99701

(907) 456-0527

(907) 456-0514 (fax)

(907) 456-0532 (TDD for hearing impaired)

<http://www.nps.gov/aplic>

Function: Clearinghouse for general information on outdoor recreation in Alaska. Information sources include U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, U.S. Geological Survey, National Park Service, Alaska Departments of Natural Resources and Fish and Game, and Alaska Division of Tourism.

BOARDS AND COMMISSIONS

Alaska Minerals Commission

Irene Anderson, Chair
c/o Sitnasuak Native Corp.

P.O. Box 905

Nome, AK 99762

(907) 443-2632

(907) 443-4023

(907) 443-3063 (fax)

email: landerson@snc.org

Function: The Minerals Commission was created by the Alaska State Legislature in 1986 to make recommendations to the Governor and the Legislature on ways to mitigate constraints on the development of minerals in Alaska. The Commission has published annual reports since 1987.

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.

CHAMBERS OF COMMERCE

Alaska State Chamber of Commerce

217 Second St., Ste. 201

Juneau, AK 99801

(907) 586-2323

(907) 463-5515 (fax)

email: ascjuno@ptialaska.net

<http://www.alaskachamber.com>

Function: The State Chamber of Commerce researches and formulates positions on Alaskan resource development. Recommendations for consideration are submitted to the State Chamber of Commerce board of directors.

Anchorage Chamber of Commerce

441 West 5th Ave., Ste. 300

Anchorage, AK 99501

(907) 272-2401

email: info@anchoragechamber.org

<http://www.anchoragechamber.org>

Greater Fairbanks Chamber of Commerce

250 Cushman St., Ste. 2D

Fairbanks, AK 99701-4665

(907) 452-1105

(907) 456-6968

email: cocestaff@mosquitonet.com

<http://www.fairbankschamber.org>

Juneau Chamber of Commerce

3100 Channel Dr., Ste. 300

Juneau, AK 99801

(907) 463-3488

(907) 463-3489 (fax)

email: jchcomm@ptialaska.net

<http://www.juneauchamber.org>

PUBLIC INTEREST GROUPS AND ASSOCIATIONS

Alaska Miners Association Inc.

Statewide Office
3305 Arctic Blvd., Ste. 202
Anchorage, AK 99503
(907) 563-9229 (907) 563-9225 (fax)
email: ama@alaskaminers.org
http://www.alaskaminers.org

Denali Branch of AMA
P.O. Box 1000
Healy, AK 99743
(907) 683-2226, ext. 719

Fairbanks Branch of AMA
P.O. Box 81906
Fairbanks, AK 99708-1906
(907) 458-8951

Juneau Branch of AMA
3100 Channel Dr., #2
Juneau, AK 99801
(907) 463-4489

Kenai Branch of AMA
P.O. Box 3503
Soldotna, AK 99669-3503
(907) 262-4472

Nome Branch of AMA
P.O. Box 1107
Nome, AK 99762-1107
(907) 443-5168

Alaska Women in Mining

Juneau Branch
P.O. Box 34044
Juneau, AK 99804
(907) 586-4161

Anchorage Branch
P.O. Box 240334
Anchorage, AK 99524
(907) 276-6762

Alaskans for Juneau

P.O. Box 22428
Juneau, AK 99802-2428
(907) 463-5065

American Institute of Professional Geologists

8703 Yates Dr., Ste. 200
Westminster, CO 80031-3681
(303) 412-6205 (303) 412-6219 (fax)
email: aipg@aipg.org
http://www.aipg.org

Alaska Section
7127 Old Seward Highway
Anchorage, AK 99518
(907) 563-2890

Earthjustice Legal Defense Fund

325 Fourth St.
Juneau, AK 99801
(907) 586-2751 (907) 463-5891 (fax)
email: eajusak@earthjustice.org
http://www.earthjustice.org

National Wildlife Federation

750 W. Second Ave., Ste. 200
Anchorage, AK 99501
(907) 258-4800 (907) 258-4811 (fax)

Neighborhood Mine Watch

P.O. Box 84531
Fairbanks, AK 99708-4531
(907) 479-3096
email: nmw@mosquiconet.com

Northern Alaska Environmental Center

218 Driveway St.
Fairbanks, AK 99701-2806
(907) 452-5021
(907) 452-3100
email: naec@northern.org
http://www.northern.org

Northwest Mining Association

10 North Post St., Ste. 414
Spokane, WA 99201
(509) 624-1158 (509) 623-1241 (fax)
email: nwma@nwma.org
http://www.nwma.org

Resource Development

Council for Alaska, Inc.
121 W. Fireweed Ln., Ste. 250
Anchorage, AK 99503
(907) 276-0700 (907) 276-3887 (fax)
email: Resources@akrdc.org

Society for Mining, Metallurgy, and Exploration Inc.

P.O. Box 625002
Littleton, CO 80162-5002
(303) 973-9550 (303) 973-3845 (fax)

Secretary Treasurer-John Rishel
1505 Atkinson Dr.
Anchorage, AK 99504
(907) 337-0511

Southeast Alaska Conservation Council (SEACC)

419 6th St., Ste. 328
Juneau, AK 99801
(907) 586-6942 (907) 463-3312 (fax)
email: info@seacc.org
http://www.seacc.org

Trustees for Alaska

1026 W. 4th Ave., # 201
Anchorage, AK 99501-1980
(907) 276-4244
email: ecolaw@trustees.org

ORGANIZED MINING DISTRICTS

Circle Mining District

P.O. Box 80674
Fairbanks, AK 99708
(907) 488-6058

Fairbanks Mining District

105 Dunbar
Fairbanks, AK 99701
(907) 456-7642

Haines Mining District

P.O. Box 149
Haines, AK 99827
(907) 766-2228

Iditarod Mining District

John A. Miscovich
General Delivery
Flat, AK 99584

Kantishna Mining District

Valerie Mundt
P.O. Box 84608
Fairbanks, AK 99708
vmundt@hotmail.com

Livengood-Tolovana Mining District

P.O. Box 55698
North Pole, AK 99705
(907) 488-6453

Valdez Creek Mining District

P.O. Box 875534
Wasilla, AK 99687-5534

Yentna Creek Mining District

P.O. Box 211
Talkeetna, AK 99676

MINERAL EDUCATION PROGRAMS

ALASKA MINERAL AND ENERGY RESOURCE EDUCATION FUND (AMEREF)

c/o RDC
121 W. Fireweed Ln., Ste. 250
Anchorage, AK 99503
(907) 276-0700 (907) 276-3887 (fax)
email: resources@akrdc.org

Function: A nonprofit corporation formed to help prepare students in grades K-12 to make informed decisions about Alaska's mineral and energy resources.

Alaska Department of Education and Early Development

801 W. 10th St., Ste. 200
Juneau, AK 99801-1894
(907) 465-2826 (907) 465-3396 (fax)
email: Cynthia_Curran@eed.state.ak.us
http://www.eed.state.ak.us/tls/minerals/minerals.html

**NATIVE REGIONAL
CORPORATIONS****AHTNA INC.**

Main Office
P.O. Box 649
Glennallen, AK 99588-0649
(907) 822-3476 (907) 822-3495 (fax)
<http://www.ahtna-inc.com/>

Anchorage Office
406 Fireweed Ln., Ste. 204
Anchorage, AK 99503-2649
(907) 274-7662 (907) 274-6614 (fax)

THE ALEUT CORP.

4000 Old Seward Hwy., Ste. 300
Anchorage, AK 99503-6087
(907) 561-4300 (907) 563-4328 (fax)
email: aleut@alaska.net
<http://www.aleutcorp.com>

ARCTIC SLOPE REGIONAL CORP.

P.O. Box 129
Barrow, AK 99723-0129
(907) 852-8633 (907) 852-5733 (fax)
<http://www.asrc.com/>

Anchorage Office
301 Arctic Slope Ave., Ste. 300
Anchorage, AK 99518-3035
(907) 349-2369 (907) 349-5476 (fax)

BERING STRAITS NATIVE CORP.

P.O. Box 1008
Nome, AK 99762-1008
(907) 443-5252 (907) 443-2985 (fax)
email: sparks@beringstraits.com
<http://www.beringstraits.com/>

BRISTOL BAY NATIVE CORP.

800 Cordova St., Ste. 200
Anchorage, AK 99501-3717
(907) 278-3602 (907) 276-3924 (fax)
<http://www.bbnc.net>

CALISTA CORP.

301 Calista Court, Ste. A
Anchorage, AK 99518-3028
(907) 279-5516 (907) 272-5060 (fax)
<http://www.calistacorp.com/>

CHUGACH ALASKA CORP.

560 E. 34th Ave., Ste. 200
Anchorage, AK 99503-4196
(907) 563-8866 (907) 561-6961 (fax)
email: rogers@chugach-ak.com
<http://www.chugach-ak.com/>

COOK INLET REGION INC.

and its subsidiary North Pacific
Mining Corporation
P.O. Box 93330
Anchorage, AK 99509-3330
(907) 274-8638 (907) 263-5190 (fax)
email: cbeery@ciri.com
<http://www.ciri.com/>

DOYON LTD.

1 Doyon Place, Ste. 300
Fairbanks, AK 99701-2941
(907) 459-2030 (907) 459-2062 (fax)
email: land@doyon.com
<http://www.doyon.com>

KONIAG INC.

4300 B St., Ste. 407
Anchorage, AK 99503
(907) 561-2668 (907) 562-5258 (fax)
<http://www.koniag.com/>

NANA REGIONAL CORP.

P.O. Box 49
Kotzebue, AK 99752
(907) 442-3301 (907) 442-2866 (fax)
<http://www.nana-online.com/>

Anchorage Office
1001 E. Benson Blvd.
Anchorage, AK 99508
(907) 265-4100 (907) 265-4123 (fax)

SEALASKA CORP.

One Sealaska Plaza, Ste. 400
Juneau, AK 99801
(907) 586-1512 (907) 586-2304 (fax)
<http://www.sealaska.com/>

APPENDIX F

Alaska Mining Websites

Mining Companies

Abacus Minerals Corp.	http://www.abacusminerals.com/
Almaden Resources Corp.	http://www.almadenresources.com/
Atna Resources Ltd.	http://www.atna.com/
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
Camnor Resources Ltd.	http://www.northair.com/camnor/
Coeur d'Alene Mines Corp. (Coeur Alaska Inc.)	http://www.coeur.com/
Cominco Ltd. (Cominco Alaska Inc.)	http://www.cominco.com/
Copper Ridge Explorations Inc.	http://www.copper_ridge.com
Cusac Gold Mines Ltd.	http://www.cusac.com
Engineer Mining Corp.	http://www.emcorp.yk.ca/
Exploration Orbite VSPA Inc. (Yellow Eagle Mining Co.)	http://www.explorationorbite.com/Index.html
Golden Phoenix Minerals Inc.	http://www.golden-phoenix.com/
Grayd Resource Corp.	http://www.grayd.com/
Great Quest Metals Ltd.	http://www.greatquest.com
Hecla Mining Co.	http://www.hecla-mining.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/
North Star Exploration Inc.	http://www.northstarexploration.com/
NovaGold Resources Inc.	http://www.nrigold.com/
Pacific Bay Minerals Ltd.	http://www.pacific-bay.com/
Placer Dome Inc.	http://www.placerdome.com/
Rimfire Minerals Corp.	http://rimfire.bc.ca/
Rubicon Minerals Corp.	http://www.rubiconminerals.com/home.htm
Shear Minerals Ltd.	http://www.shearminerals.com
Silverado Gold Mines Ltd.	http://www.silverado.com/
Teck Corp.	http://www.teckcorp.ca/
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/
Viceroy Exploration Corp.	http://www.viceroyresource.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, 1880-1999^a

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		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\$)
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	--	--
Other ^c	--	--	--	--	1,438	--	--	--	--	--	--	--	--	--	71,946	17,091.9	--	--	--	--
TOTAL	35,242,310	2,588.73	111,809,918	467,294.0	40,945	9,910.5	11,070,800	6,655.1	7,287,700	12,523.5	737,867	389,211.9	3,691,038	3,734,133.6	668,548 ^d	65,815.7	1,390,013,932	238.22	39,051	3,426.7

^aFrom published and unpublished state and federal documents.^b76-lb flask.^cNot traceable by year.^dCrude 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, 1880-1999

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	--	--	--
Other ^d	--	--	--	--	2,300,000 ^e	W	79,000	W	--
TOTAL^f	54,174,000	931.98	1,152,834,000	2,456.52	118,733,000	552.83	856,000	11,417.00	177,761,872

^aBuilding-stone production figures for 1880-1937 are for the southcentral and interior regions of Alaska only.

^bIncludes 2.4 million lb U₃O₈ (1955-71); 505,000 tons gypsum (1905-26); 286,000 lb WO₃ (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).

^cProduction not traceable by year.

^dWhen 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.

^eMarble quarried on Prince of Wales Island, southeastern Alaska (1900-41).

^fRounded to nearest 1,000 ton.

m\$ = Million dollars.

t\$ = Thousand dollars.

-- = Not reported.

W = Withheld.

**Unsurveyed Candidate Areas
(not in order of priority)**

1. Arctic (Ambler schist belt)
2. Candle
3. Nome - east
4. Bonnifield
5. Farewell
6. Boulder Creek
7. Iditarod (Flat Donlin)
8. Sleetmute
9. Yentna
10. 60-Mile Butte
11. Wiseman
12. Chandalar
13. DeLong Mountains
14. Haines/Klukwan
15. Chichagof
16. Gold Hill
17. Steese/Upper Chena
18. Skwentna
19. Sheep Mountain
20. King Mountain
21. Mentasta/Slana
22. Cantwell/Windy Pass
23. Paxson/McLaren
24. Tonsina/Tiekel
25. Goodpaster
26. Tanana/Melozi
27. Willow Creek
28. Yenlo Hills
29. Upper Kobuk River
30. Baird Mountains
31. Marshall
32. Delta
33. Pebble
24. Jurassic Arc
35. Ladue
36. Shotgun Hills
37. Shaw Creek

**Geophysical Data Areas and
Release Dates**

- A. Circle, 1994
- B. Fairbanks, 1998
- C. Nome - west, 1994
- D. Nyac, 1994
- E. Valdez Creek, 1994
- F. Richardson, 1995
- G. Rampart/Manley, 1996, 1997
- H. Chulitna, 1997
- I. Petersburg, 1997
- J. Stikine, 1997
- K. Ruby, 1998
- L. Iron Creek, 1998
- M. Koyukuk, 1998
- N. Livengood, 1999
- O. Fortymile, 1999
- P. Ketchikan, 1999

**Geophysical Data to be
Released Early 2000**

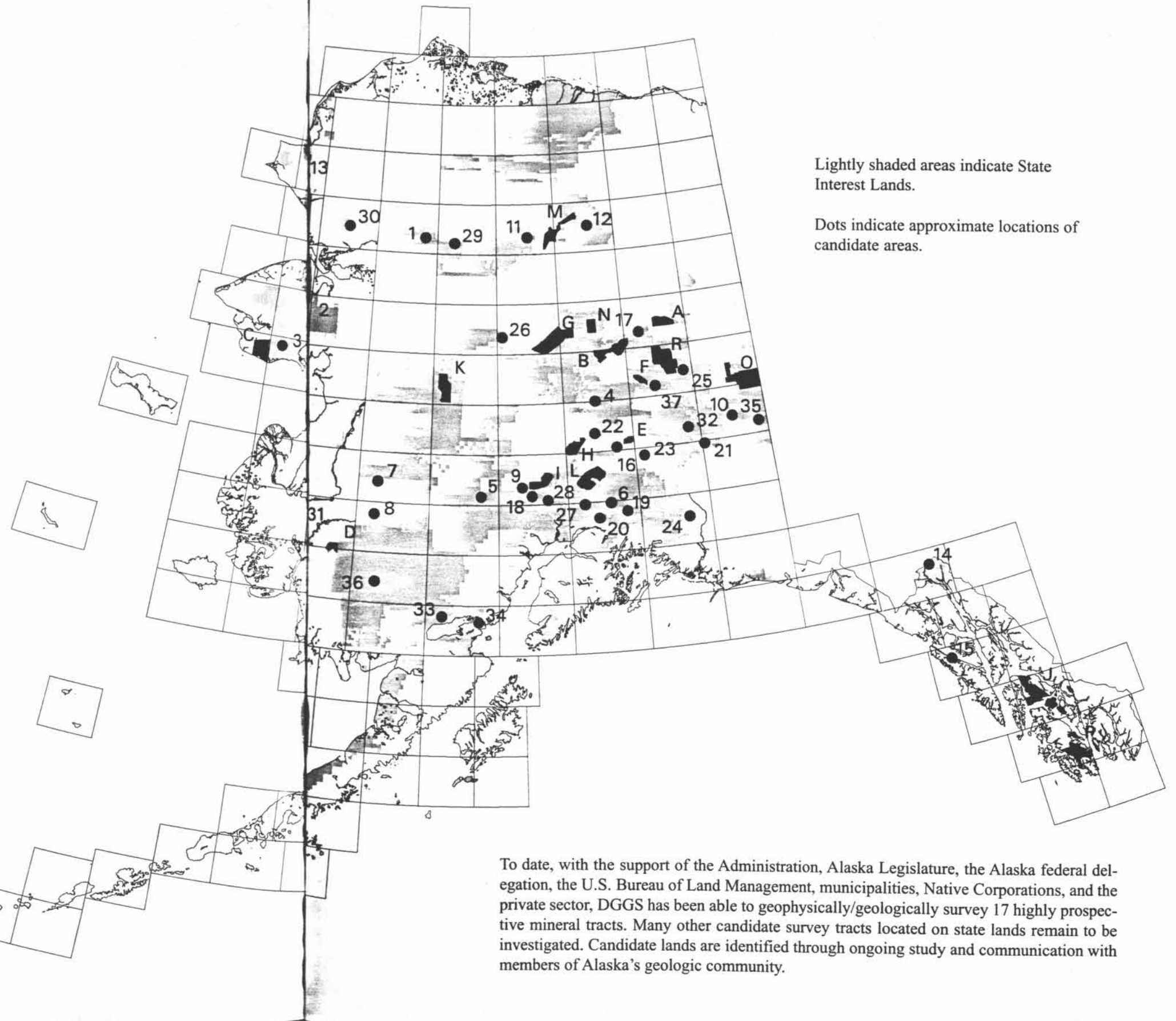
- R. Salcha, North Pogo area

Alaska Airborne Geophysical/ Geological Mineral Inventory

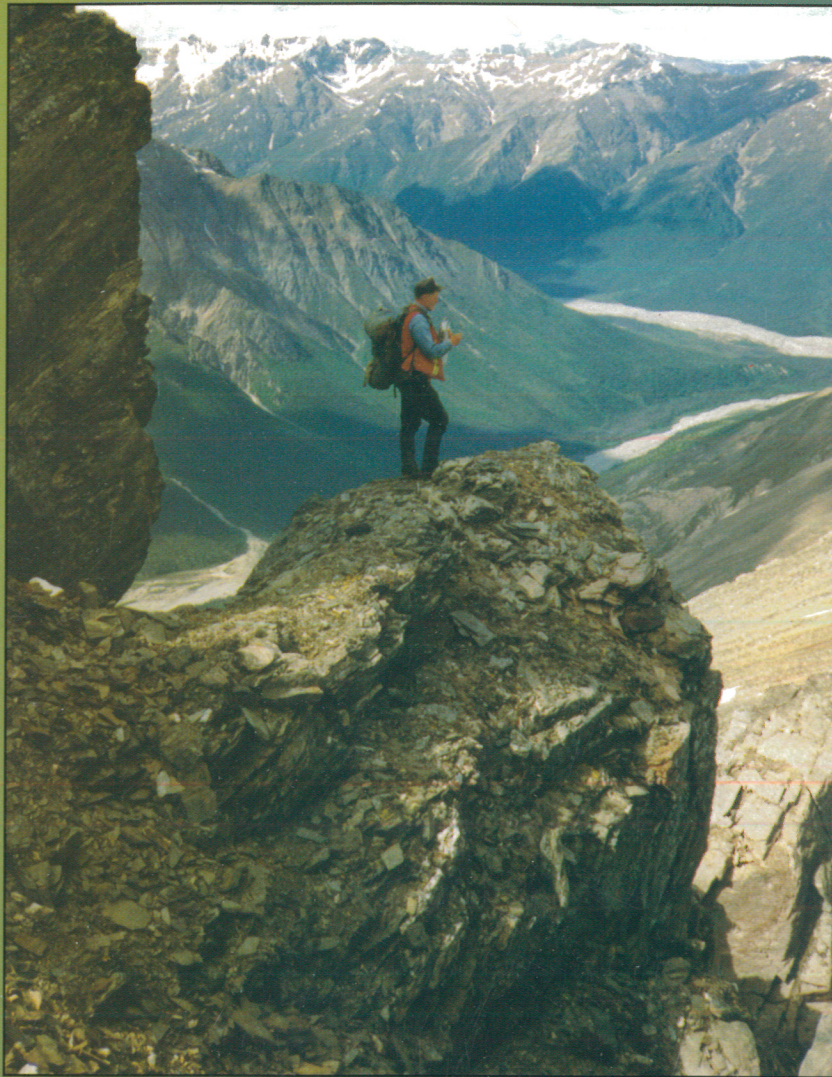
Progress as of September 1999

Lightly shaded areas indicate State
Interest Lands.

Dots indicate approximate locations of
candidate areas.



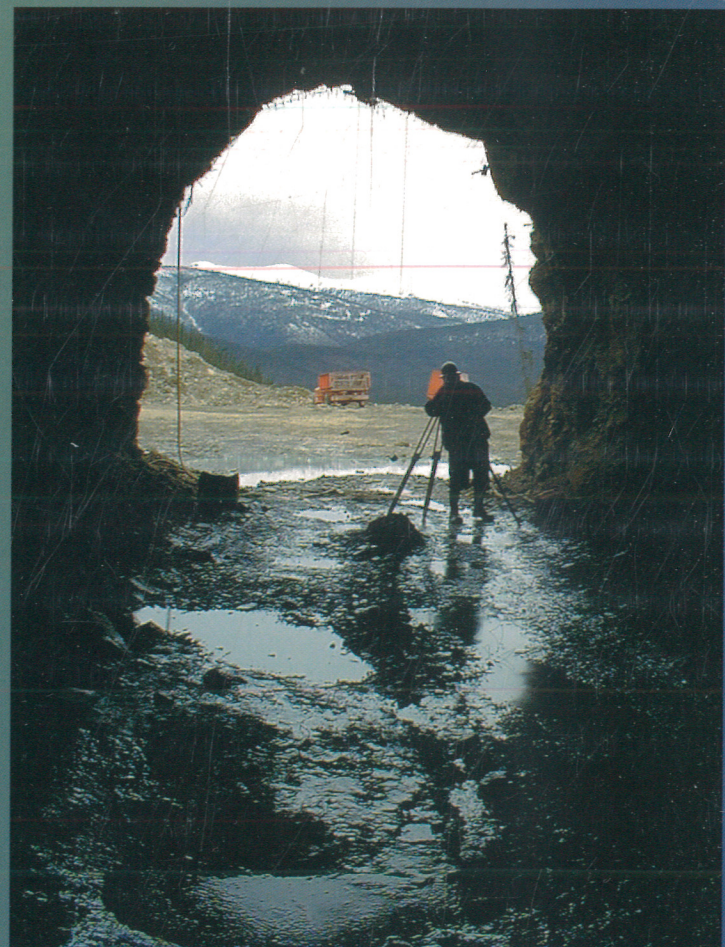
To date, with the support of the Administration, Alaska Legislature, the Alaska federal delegation, the U.S. Bureau of Land Management, municipalities, Native Corporations, and the private sector, DGGs has been able to geophysically/geologically survey 17 highly prospective mineral tracts. Many other candidate survey tracts located on state lands remain to be investigated. Candidate lands are identified through ongoing study and communication with members of Alaska's geologic community.



TOP LEFT: Northern Associates Inc. geologist Ed Hunter mapping above Rumble Creek in the Delta Mineral Belt. *(Photo provided by Sam Dashevsky)*



TOP RIGHT: Angel Vilar, one of the underground miners working in the decline at Teck Corp./Sumitomo Corp.'s Pogo gold deposit. *(Photo provided by Teck Resources Inc.)*



RIGHT: Pogo decline with surveyor. *(Photo provided by Teck Resources Inc.)*

BOTTOM RIGHT: Curt Freeman examining outcropping quartz veins in the Goodpaster mining district. *(Photo provided by Avalon Development Corp.)*

BOTTOM LEFT: Airborne Exploration Inc. technician observes Art Gaona adjusting drillstem on Bombardier auger drilling rig in Fairbanks district. *(Photo provided by Avalon Development Corp.)*

