Alaska's Mineral Industry 2006

Special Report 61

View of the Pogo Mine mill facilities. The covered conveyor system feeds ore from the mine to the conventional SAG and ball mill grinding circuit, gravity circuit, and then to flotation and cyanidation processes. After cyanide detoxification, the tailings are filtered and then either drystacked or used as paste backfill in the mine workings. Photo provided by Teck Cominco Inc.

Division of Geological & Geophysical Surveys
in cooperation with
Office of Economic Development and
Division of Mining, Land & Water

Alaska's Mineral Industry 2006

by
D.J. Szumigala and R.A. Hughes

Division of Geological & Geophysical Surveys

SPECIAL REPORT 61

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GOVERNOR'S FOREWORD

I am honored to present this report documenting the continuing strength of Alaska's mineral industry in 2006. This report tells the story of a healthy, growing, and forward-looking sector of our economy whose best days are still to come.

Alaska is blessed with a vast array of natural resources, and one of the fundamental responsibilities of state government is to provide responsible stewardship and wise development of this endowment for the benefit of the people of our state. As we approach the end of our first half-century of statehood, it is satisfying to know that we are successfully fulfilling this responsibility.

The clearest demonstration of this success is that the total value of our mineral industry continues to increase. Exploration and development expenditures, combined with production value of our mineral resources, increased by an astounding 91 percent over the year before. We now have five large producing mines in the state—Greens Creek, Fort Knox, Red Dog, Pogo, and Usibelli. Two new mines are under construction, and exploration investment continues to increase. Numerous small mines throughout the state also contribute to Alaska's economy.

Our mineral industry's contribution to the state and local economies has dramatically increased. Tax, royalty, and fee payments to state and local governments increased to more than $170 million in 2006, a $111 million increase from 2005. In addition, mining has long offered Alaskans the benefit of generating steady jobs that pay among the highest average wages in the state. In 2006, mining generated an estimated 3,523 full-time jobs, an increase of 702 jobs over 2005. Many of these employment opportunities occur in rural areas where residents are eager to provide the needed staffing and services. Exploration and mining activity will continue to generate even more jobs as more prospects are proven viable.

While these figures are welcome, they cannot measure the new energy and spirit that are suffusing the industry. The men and women who make up Alaska's mining community carry with them a hard-won air of energy and optimism that says as much about the quality of their characters as it does about the economics of their industry. I am proud of the accomplishments of miners, and of the spirit that makes those accomplishments possible. I wish them continued success as they, and we, look to the future with excitement and confidence.

Governor Sarah Palin

COMMISSIONER'S FOREWORD

The Department of Commerce, Community & Economic Development is pleased to participate with the Department of Natural Resources to bring you the 26th annual report on Alaska's mineral industry.

This report clearly shows that the Alaska mineral industry continues to mature and expand. The Department of Commerce is proud to contribute to the important industry growth by promoting and assisting responsible development of Alaska's vast and diverse mineral resources.

In 2006, for the 11th consecutive year, the total value of the industry exceeded $1 billion and actually exceeded $3 billion. The state moved from 13th to 6th in ranking among the 50 states for value of non-fuel minerals production value. Rising metal prices bode well for the profitability of future and now-producing mines, for moving existing projects forward, and for enticing exploration for new and existing discoveries in the state.

Existing projects provided nearly 3,500 high-paying jobs in 2006, up significantly from 2005 at about 2,800 jobs. This increase reflects the growing industry efforts in the state in the form of increased exploration, increased construction of new mines, and the commissioning of the Pogo Mine. With a number of major projects now in progress, significant improvements in the industry's value and job opportunities are expected in future years.

The Pogo Mine started operation during the year, poured its first bar of gold on February 12th, and is forecasting a production of 340,000 ounces during 2007 after completing installation of all equipment and facilities. Coeur Alaska continued construction at the Kensington project, but has been unable to settle the tailings disposal issue revolving around using the Lower Slate Lake disposal site. Rock Creek/Big Hurrah and Nixon Fork are in advanced stages of development with initial production expected in 2007. Barrick/NovaGold's advanced stage Donlin Creek gold exploration project is moving forward with feasibility studies, advanced ore definition, and engineering.

In the longer term, the Pebble project in southwestern Alaska and the intense exploration that this project has attracted to the area, projects along the south flank of the Brooks Range and in the Alaska Range, projects in the Goodpaster district near Pogo, the Chuitna Coal project near Anchorage, the Niblack project in southeast Alaska and others, promise exciting future opportunities. The statewide minerals industry is forecast to grow significantly in the next 7 to 10 years.

The Palin Administration continues to provide a favorable business climate for statewide mineral industry growth. Alaska's taxation and fee structure is fair and stable, and the regulatory structure is progressive. State government's direct support through incentives, information, and technical support provides a valuable asset for companies active in Alaska mineral development.

Emil Notti, Commissioner, Department of Commerce, Community and Economic Development

COMMISSIONER'S FOREWORD

I am pleased to present this report documenting 2006 as the most profitable year ever for Alaska's mineral industry. The information contained in this booklet—production figures, investment totals, workforce strength, and more—shows clearly that Alaska is successfully developing its mineral wealth for the good of our people. It is important for Alaskans to understand our mineral industry's significant contribution to our state, especially in light of the increasing level of concern about mining's impacts and ability to "pay its own way."

The minerals industry is contributing significantly to the state and local economies. Expenditures for exploration activities rose to $179 million in 2006, and investment in development projects rose to $496 million. Industry paid more than $170 million in royalty and tax payments to the State of Alaska and Alaska municipalities in 2006, almost $111 million more than the previous year. Mining companies were the largest taxpayers in the City and Borough of Juneau and the Fairbanks North Star, Denali, and Northwest Arctic boroughs, contributing total payments of almost $14 million. Strong metal prices and strong demand for Alaska's minerals directly affect the profitability of Alaska's mines. Taxes on those profits pass additional benefits to the State of Alaska and its people.

The number of mining jobs in Alaska continues to rise. The minerals industry provided 3,521 full-time-equivalent jobs in 2006, the highest number of jobs in the past 10 years—700 more jobs than last year. As new mines currently in the pipeline begin production, the mining industry will provide even more high-paying jobs to Alaskans. These jobs provide skills that lead to lifetime careers, positively affecting families. Mining benefits many Alaskans through direct employment and through local purchases of supplies for mines and associated industries. These wages and purchases are felt in communities throughout Alaska as a positive ripple effect on many people not directly employed or associated with mining. The effects of this sizeable fiscal impact by the mining industry are felt throughout the state.

This prosperity comes at a time of increasing public dialogue over the place of mining in Alaska's future. There have been numerous legislative and citizen initiatives which would outright ban significant mining in certain parts of the state—some would even threaten to eliminate large-scale mining from our state entirely. I believe that these initiatives are based largely on three unfounded claims: that our mine permitting process is inadequate, that mining cannot be done in an environmentally sound manner, and that mining does not pay its own way.

Anyone who has participated in Alaska's large mine permitting process will tell you that it is a rigorous and strong process. We have an experienced interagency team, most of whom have advanced degrees in their disciplines and have many years of experience in permitting and regulating large mines. The process is rooted in strong laws and regulations to protect our air and water quality, our fish and game resources, and our health. Our team will not permit a mine that can't ensure the protection of our air and water quality.

As for the claim that mines cannot be developed in an environmentally responsible manner, one only has to look at our operating Alaska mines to see that this is simply not true. Our two oldest and largest open-pit mines, Red Dog and Fort Knox, both have healthier fish populations downstream now than either did before the mines were in existence. This is documented by numerous publicly available reports written by habitat biologists from the departments of Fish and Game and Natural Resources.

As you will read in this report, mining has become a significant contributor to our economy—we congratulate the mining industry for its successes. Rural Alaskans in particular stand to benefit tremendously from the potential economic input to their regions. We must recognize the significant positive impacts that responsible mining can have for Alaskans.

Tom Irwin, Commissioner, Department of Natural Resources

EXECUTIVE SUMMARY

Alaska's Mineral Industry 2006 is the 26th in a series of annual reports. The reports are a cooperative venture between the Division of Geological & Geophysical Surveys (DGGS) and the Division of Mining, Land & Water in the Department of Natural Resources, and the Office of Economic Development in the Department of Commerce, Community & Economic Development. This report and data supersede previously published DGGS Information Circular 54.

Alaska's mineral industry grew in value, workforce numbers, and number of large lode mines from 2005 through 2006, and into 2007. Continued strong metal prices throughout the year led to record production values for Alaska's minerals.

The 2006 cumulative value of Alaska's mineral industry reached a new high of $3.533 billion, a combination of exploration and development investments, plus the gross value of mineral products. The new record, nearly double the 2005 record value, was the 11th straight year exceeding $1 billion.

Alaska's exports topped $4 billion in 2006, a 12 percent increase from 2005. Minerals such as zinc and lead contributed 29 percent of the value of the exports, or $1.2 billion. Mineral export value doubled from 2005 to 2006 and set a new record for Alaska. Zinc ore was the highest value commodity exported from the state.

The mineral industry paid a total of $171.9 million in royalty and tax payments to the State of Alaska and Alaska municipalities in 2006. These payments increased by almost $111 million from the previous high of $61.1 million collected in 2005. Mining license taxes increased by 425 percent from 2005 values. Mining companies were the largest taxpayers in the City and Borough of Juneau and the Fairbanks North Star, Denali, and Northwest Arctic boroughs, contributing total payments of almost $14 million.

The total minerals industry employment in 2006 is estimated to be 3,523 full-time-equivalent jobs, an increase of 700 jobs above the 2005 estimate, and the highest number of jobs over the past decade. Alaskan metal miners made an average monthly wage of $6,802 during 2006, according to the Alaska Department of Labor & Workforce Development; support services for the mining industry provided a reported 7,606 additional jobs for Alaskans during 2006.

Exploration expenditures in Alaska during 2006 reached $178.9 million, 72 percent higher than the $103.9 million spent in 2005. At least 26 projects had exploration expenditures of $1 million or more and 40 projects had exploration expenditures in excess of $100,000. These projects were located across Alaska, with almost $124 million spent

in southwestern Alaska. More than 755,000 feet of drilling were recorded in 2006 on exploration projects. Companies explored for a wide variety of mineral deposits, and gold remained a major exploration commodity, but exploration for copper–gold porphyry systems (grouped with polymetallic deposits) was the major exploration target in 2006. Advanced exploration projects include Barrick Gold Corp.–NovaGold Resources Inc.–Calista Corp.'s 33.7-million-ounce Donlin Creek intrusion-hosted gold project and Northern Dynasty Minerals Ltd.'s Pebble copper–gold porphyry project in southwestern Alaska. The Pebble project, with newly announced measured mineral resources of 67 billion pounds of copper, 82 million ounces of gold, and 5.2 billion pounds of molybdenum, was the largest Alaskan mineral exploration project in 2006.Exploration at Alaska's mines continues to unearth new mineralization and extend mine lives.

Development projects were spread throughout the state, with total expenditures of $495.7 million. This is the highest year for development expenditures on record. Expenditures in 1996 (the previous record) were $394 million and included the construction of the Fort Knox Mine. Mine construction continued at Teck Cominco-Sumitomo's Pogo gold project in eastern Alaska, at Coeur Alaska's Kensington gold project in southeastern Alaska, and at Mystery Creek's Nixon Fork Mine near McGrath; construction was started at NovaGold's Rock Creek gold project during the year.

Production values of $2.858 billion eclipsed all previous years on record. Production volumes were up for all metal commodities except zinc and were down for all non-metal commodities except peat. Values of production in decreasing order were from Red Dog Mine (72.6 percent); Greens Creek Mine (11.9 percent); Fort Knox Mine (7.0 percent); rock, sand, and gravel operations (3.1 percent); other gold mines including Pogo Mine (2.4 percent); coal and peat (1.7 percent); and placer gold operations (1.3 percent). Zinc accounted for 70.1 percent of the total mineral production, followed by gold (12.0 percent), silver (6.6 percent), lead (6.42 percent), rock, sand, and gravel (3.1 percent), and coal and peat (1.7 percent).

Geologists from the Alaska Division of Geological & Geophysical Surveys (DGGS) mapped and sampled 308 square miles of the Casadepaga River, Bear River, and Bluff areas of the southern Seward Peninsula. The State of Alaska, through DGGS, funded and acquired airborne magnetic and electromagnetic geophysical surveys of 600 square miles in a highly prospective area for base-metal and gold deposits in the Bonnifield mining district. In late January 2006, DGGS released the geophysical data and maps for four areas of Interior Alaska: Northeast Fairbanks, East Richardson, Liscum, and Black Mountain. DGGS also released airborne geophysical survey data for a 3,045-square-mile area along the Alaska Highway from Delta Junction to the Canada border that may include future development such as a natural gas pipeline, a railroad extension, or other infrastructure. A geophysical survey funded by the U.S. Bureau of Land Management for 1,450 square miles of mineral-rich lands in the southern National Petroleum Reserve–Alaska (NPR-A) were flown in 2005 and released by DGGS in early 2006. The U.S. Geological Survey (USGS) contracted for an aeromagnetic survey of the Dillingham Quadrangle and released the data in mid 2006. The USGS continued geologic mapping and geochemical sampling in the Taylor Mountains Quadrangle of southwestern Alaska.

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Alaska's Mineral Industry 2006

D.J. Szumigala[1] and R.A. Hughes[2]

INTRODUCTION

Alaska's mineral industry had an exceptional year in 2006, with strong metal prices and renewed interest in Alaska's outstanding mineral endowment funding record investment in all phases of the Alaska mineral industry. The total value of Alaska's mineral industry was $3.533 billion, a record value, 90 percent above the record value set in 2005, and the eleventh straight year above the $1 billion mark.

Exploration expenditures rose sharply (72 percent) above robust 2005 levels to more than $175 million. Twenty-six projects, which extend across the state, reported exploration expenditures of $1 million or more, and 40 additional projects had exploration expenditures of at least $100,000.

Development projects were spread throughout the state and total expenditures were $495.7 million. This year marks the highest development expenditures on record. Expenditures in 1996 (the previous highest recorded year) were $394 million and included the construction of the Fort Knox Mine. Mine construction continued at Teck Cominco–Sumitomo's Pogo gold project in eastern Alaska, at Coeur Alaska's Kensington gold project in southeastern Alaska, and at Mystery Creek's Nixon Fork Mine near McGrath; construction began at NovaGold's Rock Creek gold project near Nome during the year. Mine rehabilitation and development was completed at St. Andrew Goldfields Ltd.'s Nixon Fork Mine near McGrath, with the mill commissioned in December.

Production values reaching $2.858 billion soared above all previous years of record and more than doubled 2005's value of $1.402 billion. Production volumes from Alaska's lode mines were level or down compared to 2005. However, continued strong metal prices overcame production shortfalls. Strong zinc prices contributed to a $1.54 billion value of Red Dog Mine 2006 production. Ore was fed to the mill at the Pogo Mine on January 12 and the first gold pour was on February 12. Values of production, in decreasing order, were from Red Dog (72.6 percent), Greens Creek (11.9 percent), Fort Knox (7.0 percent), rock, sand and gravel operations (3.1 percent), other gold mines (Pogo, other) (2.4 percent), coal and peat (1.7 percent), and placer gold operations (1.3 percent).

Figure 1 shows the regions of the state used in this and subsequent sections. Table 1 and figure 2 show the estimated value of the mineral industry in Alaska per year between 1981 and 2006, as divided between exploration and development investments, and the gross value of mineral products. Company information is used to define the exploration and development parameters. Average metal prices are calculated from the daily London PM closing price for gold, and from the average weekly spot price on the London Metal Exchange for the other metals. It is important to note that these prices are used to calculate the value of metals produced in the state, but do not take into account the costs of mining or transportation, or smelter charges and penalties. Coal prices are estimated from average coal prices for similar grade material around the Pacific Rim. Industrial material prices are based on regional rates provided by some operators.

Please note that the formatting and presentation of data in some tables has changed compared to previous editions of this report due to changes in data collected and accounting practices by the mining industry. Whenever possible, the authors have strived to maintain consistency of data

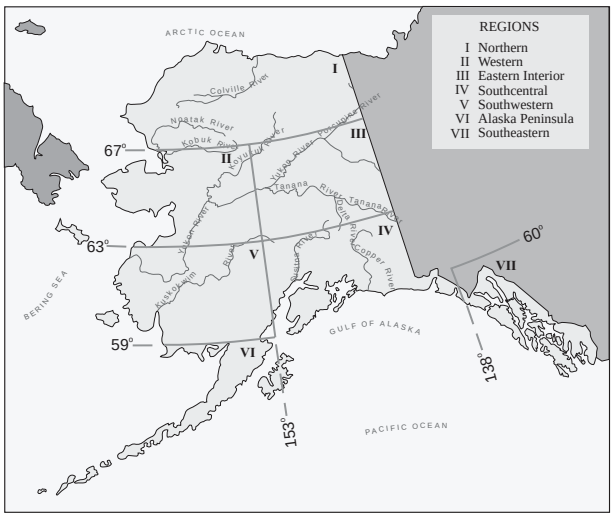


Figure 1. *Regions of mineral activity as described in this report.*

[1]Alaska Division of Geological & Geophysical Surveys, 3354 College Rd., Fairbanks, Alaska 99709-3707

[2]Alaska Department of Commerce, Community & Economic Development, Office of Economic Development, 211 Cushman St., Fairbanks, Alaska 99701

for seamless year-to-year comparisons. Most changes are noted in footnotes in the affected tables.

This summary of Alaska's mineral industry activity for 2006 is the 26th in the series of annual reports, and is made possible by information provided through press releases, annual reports, phone interviews, and replies to questionnaires mailed by the Alaska Division of Geological & Geophysical Surveys (DGGS). This report is part of a cooperative venture between DGGS and the Division of Mining, Land & Water (DMLW) in the Department of Natural Resources (DNR) and the Office of Economic Development in the Department of Commerce, Community & Economic Development (Commerce). Commerce provides the funding to print the report. Information in this report supersedes data previously published in DGGS Information Circular 54.

EMPLOYMENT

Table 2 lists estimated employment in the Alaska minerals industry for the past 8 years. Figure 3 displays employment within various segments of Alaska's mineral industry. Figure 4 shows the trends in Alaskan mineral industry employment over the past 9 years. The total minerals industry employment in 2006 is estimated to be 3,523 full-time-equivalent jobs, an increase of 702 jobs from the estimated 2005 total of 2,821 jobs. Most of the employment increase was in gold mining, exploration, and development. It is expected that the number of jobs in the development sector will decrease for 2007 because the development phase of the Pogo project is nearly complete. Higher metal prices may also spur more placer gold mining, but higher fuel costs may limit that change. However, a worldwide shortage of experienced miners and mine employees may further affect the growth of lode mining in Alaska.

The average monthly wage for metal mining in Alaska during 2006 was $6,802, according to the Alaska Department of Labor & Workforce Development. They report the average monthly wage for the aggregated coal, metal, and nonmetallic mining and mining support activities was $6,671, with an average annual workforce of 1,751 employees. The mining support activities sector of the labor force provided an average of 7,606 jobs at an average monthly wage of $7,183 during 2006 and the metal–mineral subsector of the wholesale trade sector of the workforce provided an average of 107 jobs during

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

	Exploration (expenditure)	Development (expenditure)	Production (value)	Total (calculated)
1981	$76.3	$24.7	$188.6	$289.6
1982	45.6	41.6	196.4	283.6
1983	34.1	27.9	212.4	274.4
1984	22.3	53.4	199.4	275.1
1985	9.2	34.1	226.6	269.9
1986	8.9	24.3	198.5	231.7
1987	15.7	100.3	202.4	318.4
1988	45.5	275.0	232.2	552.7
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	29.6	560.8	620.6
1993	30.3	27.7	448.7	506.7
1994	31.1	45.0	507.5	583.6
1995	34.3	148.6	537.2	720.1
1996	44.7	394.0	590.4	1,029.1
1997	57.8	168.4	936.2	1,162.4
1998	57.3	55.4	921.2	1,033.9
1999	52.3	33.8	1,032.9	1,119.0
2000	34.9	141.7	1,106.4	1,283.0
2001	23.8	81.2	917.3	1,022.3
2002	26.5	34.0	1,012.8	1,073.3
2003	27.6	39.1	1,000.7	1,067.4
2004	70.8	209.1	1,338.7	1,618.6
2005	103.9	347.9	1,401.6	1,853.4
2006	178.9	495.7	2,858.2	3,532.8
TOTAL	**$1,210.9**	**$3,006.7**	**$18,183.6**	**$22,401.2**

Source: Alaska's Mineral Industry reports published annually by DGGS/ Commerce.

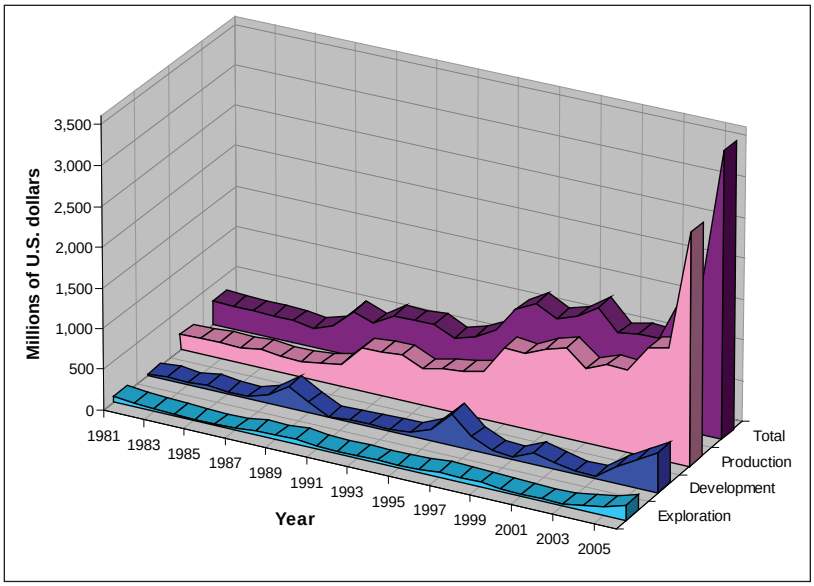
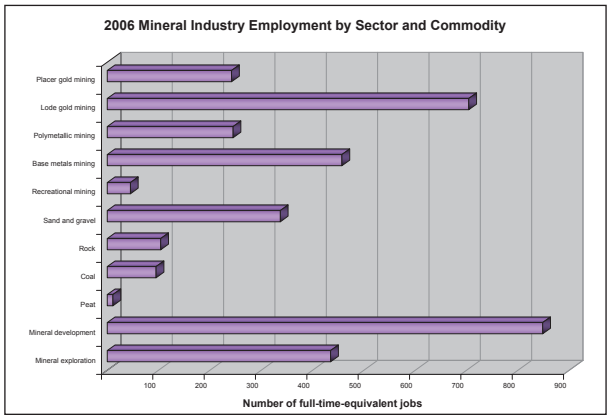


Figure 2. *Alaska's mineral industry total value, 1981–2006.*

Table 2. *Estimated Alaska mine employment, 1999–2006*[a]

	1999	2000	2001	2002	2003	2004	2005	2006
Gold/silver mining								
Placer	591	470	176	148	82	64	86	242
Lode	296	274	337	413	325	433	411	704
Polymetallic mining	275	275	275	262	295	265	250	245
Base metals mining	549	556	559	580	388	508	449	457
Recreational mining	240	250	210	180	175	175	175	45
Sand and gravel	590	603	556	702	349	567	400	337
Rock	128	150	137	177	35	475	148	104
Coal	121	121	121	100	65	90	95	95
Peat[b]	38	36	32	21	20	4	6	11
Tin, jade, soapstone, ceramics, platinum	20	20	20	20	20	- -	- -	- -
Mineral development	135	345	333	135	64	283	498	848
Mineral exploration	183	83	79	86	88	184	303	435
TOTAL	**3,166**	**3,183**	**2,835**	**2,824**	**1,906**	**3,048**	**2,821**	**3,523**

[a]Reported man-days are calculated on a 260-day work year to obtain average annual employment unless actual average annual employment numbers are provided.
[b]This figure does not include all of the man-days associated with peat operations; most of those man-days are included in sand and gravel numbers.
- - = Not reported.



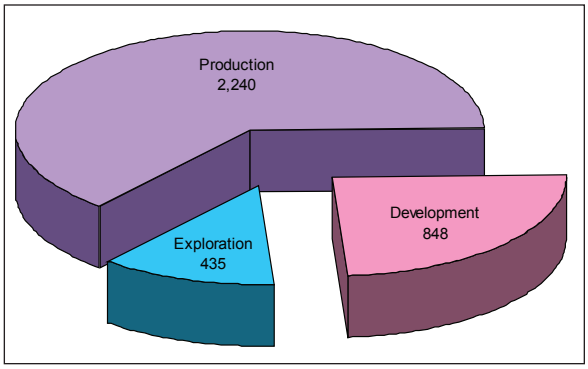


Figure 3. *2006 mineral industry employment in Alaska by category.*

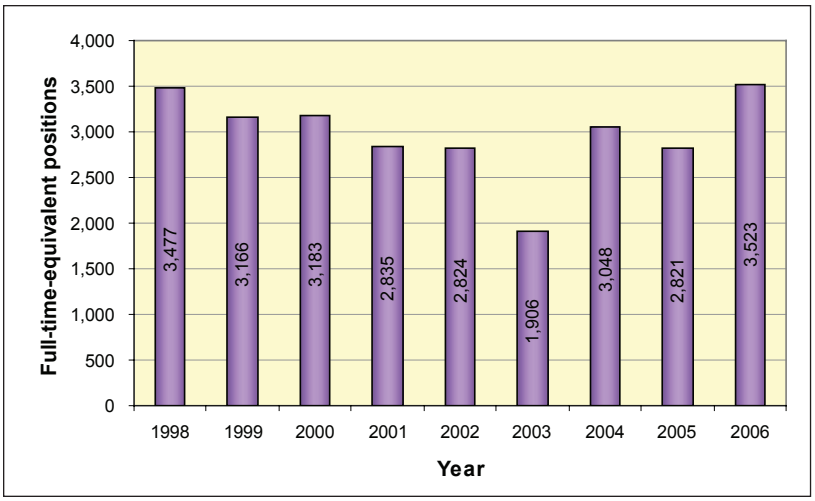


Figure 4. *Total mineral industry employment in Alaska from 1998 to 2006.*

2006. Cement and concrete manufacturing provided an average of 357 jobs during 2006, glass manufacturing provided three jobs, and other nonmetallic mineral product manufacturing provided an average of eight jobs. Please note that the Labor & Workforce Development statistics are collected using different methods than the employment figures collected for this report; thus, there is no direct correlation between the two sets of employment figures.

ACKNOWLEDGMENTS

This report on the Alaska mineral industry is intended to provide current, accurate, and technically reliable information. The authors wish to thank all companies, agencies, and individuals that responded to the questionnaires or phone calls and provided information about their activities and operations. Without their voluntary and timely information this report would not be possible. DGGS mailed more than 600 questionnaires in December 2006 and received 132 responses. Questionnaires were mailed through mid 2007 to additional businesses. Dave Szumigala (DGGS) and Rich Hughes (Commerce) prepared the body of the text, tables, and appendices with information supplied by many individuals and with the assistance of staff from other agencies. Where appropriate, these people have been acknowledged in the text. Information and text previously compiled for DGGS Information Circular 54 were used extensively.

The cover design is by Joni Robinson, and the graphic illustrations are modified from earlier versions made by Fred Sturmann and Joni Robinson of DGGS. Paula Davis (DGGS) edited the final version, and Joni Robinson completed the layout and design. Commerce's Office of Economic Development paid printing costs.

EXPLORATION

Exploration expenditures in Alaska during 2006 were at least $178.9 million, 72 percent higher than the $103.9 million spent in 2005. Figure 5 shows the location of the most significant exploration projects in Alaska during 2006. Higher exploration expenditures in Alaska mirror increased worldwide mineral exploration budgets. The increases in worldwide exploration expenditures resulted from a combination of increased spending by major mining companies, a significant reduction in the negative influence of industry consolidation from peak years 2000 and 2001, and higher spending by junior mining companies in response to stronger gold and base-metal prices. The stronger Canadian dollar and attractive tax incentives for investors in Canada-based projects likely limited even more investment in Alaska.

Twenty-six projects distributed across the state had exploration expenditures of at least $1 million, and 40 additional projects had exploration expenditures of $100,000 or more. Figure 6 and table 3 show 2006 exploration expenditures in Alaska by region. Almost $123.8 million was spent in southwestern Alaska, with $12.1 million spent in eastern Interior Alaska, more than $12.4 million spent in western Alaska, $9.9 million spent in southeastern Alaska, roughly $9.8 million spent in southcentral Alaska,

Table 3. *Reported exploration expenditures and employment in Alaska, 2006*

	Northern	Western	Eastern interior	South-central	South-western	South-eastern	Alaska Peninsula	Total
				Exploration expenditures				
Placer	$ 103,000	$ 148,640	$ 282,160	$ 109,000	$ 22,000	$ 65,860	$ -	$ 730,660
Lode	9,774,376	12,254,666	11,792,322	9,684,317	123,731,973	9,866,280	1,093,256	178,197,190
TOTAL	**$9,877,376**	**$12,403,306**	**$12,074,482**	**$9,793,317**	**$123,753,973**	**$9,932,140**	**$1,093,256**	**$178,927,850**
				Exploration employment				
Employment workdays	2,726	2,744	23,949	10,435	64,952	7,663	667	113,136
Workyears[a]	10	11	92	40	250	29	3	435
Companies reporting[b]	5	15	43	23	17	12	2	103

[a]Based on 260-day workyear.
[b]Some companies were active in several areas.

I Northern Region

1. Red Dog Mine—Teck Cominco Alaska Inc.
2. Ambler Project
   a. Ambler Project—NovaGold Resources Inc.
   b. Sun—Andover Ventures Inc.
3. Nolan Creek Mine—Silverado Gold Mines Ltd.
4. Western Arctic Coal—BHP Billiton Ltd.

II Western Region

5. Rock Creek, Big Hurrah—NovaGold Resources Inc.
6. Boulder Creek—Triex Minerals Corp./Full Metal Minerals Ltd.
7. Big Bar—Quaterra Resources Inc.
8. Granite Mountain area—Linux Gold Corp.
9. Khotol—NovaGold Resources Inc.
10. Nixon Fork Mine—St. Andrew Goldfields Ltd.

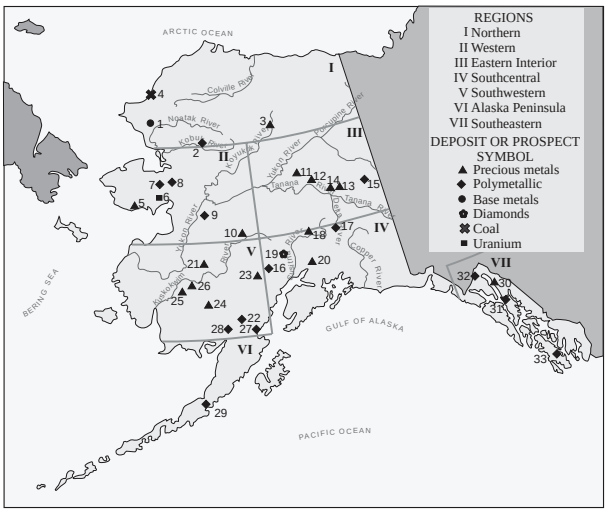
III Eastern Interior Region

11. Livengood—International Tower Hill Mines Ltd.
12. Fairbanks District
    a. Fort Knox, Gil & District—Kinross Gold Corp.
    b. Golden Summit—Freegold Ventures Ltd.
13. Pogo—Goodpaster mining district
    a. Pogo—Teck Cominco Alaska Inc.
    b. LMS—International Tower Hill Mines Ltd.
    c. Stone Boy—Pathfinder Mineral Services
14. Uncle Sam—Midas Resources Ltd. (Genesee Gold Mines LLC)
15. Fortymile—Full Metal Minerals Ltd.

IV Southcentral Region

16. Whistler—Kennecott Exploration Co.
17. MAN—Anglo American Exploration (USA) Inc., Nevada Star Resources Inc.
18. Golden Zone—Piper Capital Inc./Hidefield Gold Plc.
19. Shulin Lake—Golconda Resources Ltd./Shulin Lake Mining Inc./Shear Minerals Ltd.
20. Lucky Shot—Full Metal Minerals Ltd.

Figure 5. *Selected exploration projects in Alaska, 2006.*



V Southwestern Region

21. Donlin Creek—Barrick Gold Corp.
22. Pebble area
    a. Pebble—Northern Dynasty Minerals Ltd.
    b. Big Chunk—Liberty Star Gold Corp.
    c. Pebble South—Full Metal Minerals Ltd.
23. Terra—International Tower Hill Mines Ltd.
24. Shotgun—TNR Gold Corp./NovaGold Resources Inc.
25. Nyac—Tonogold Resources Inc.
26. Kisa—Gold Crest Mines Inc.
27. Kamishak—Andover Ventures Inc./Full Metal Minerals Ltd.
28. Iliamna—Geocom Resources Inc./TNR Gold Corp.

VI Alaska Peninsula Region

29. Bee Creek—Metallica Resources Inc. /Full Metal Minerals Ltd.

VII Southeastern Region

30. Kensington, Jualin—Coeur Alaska Inc.
31. Greens Creek Mine—Kennecott Minerals Co.
32. Palmer—Constantine Metal Resources Ltd.
33. Niblack—Niblack Mining Corp.

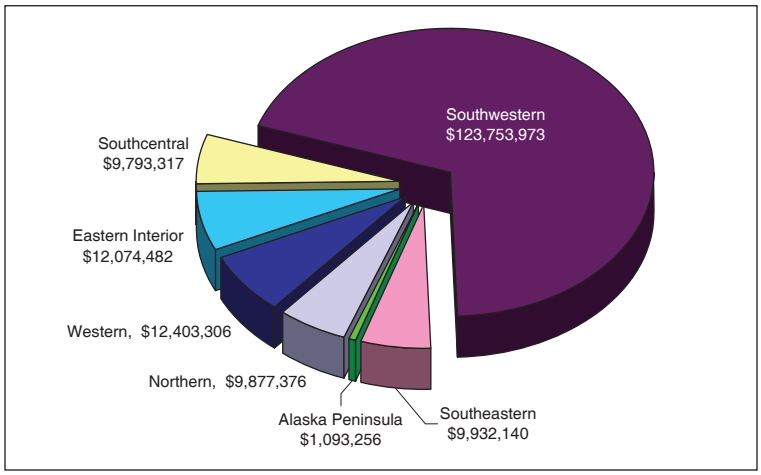


Figure 6. *2006 Alaska exploration expenditures by region.*

$9.9 million spent in northern Alaska, and more than $1 million spent in the Alaska Peninsula region. As in years past, the majority of exploration funds (more than 89 percent) were derived from Canadian sources. At least 755,000 feet of exploration core and rotary drilling were completed in 2006.

Companies explored for a wide variety of mineral deposits in Alaska during 2006. Table 4 lists exploration expenditures by commodity and figure 7 shows this data graphically. Gold remained a major exploration commodity, but exploration for copper–gold porphyry systems (grouped with polymetallic deposits) was the major exploration target in 2006. Base-metal exploration expenditures increased significantly from 2003 levels. Platinum-group-element exploration expenditures dropped. Figure 8 shows 2006 Alaska exploration expenditures by deposit type. Nearly equal amounts were spent on intrusion-related gold

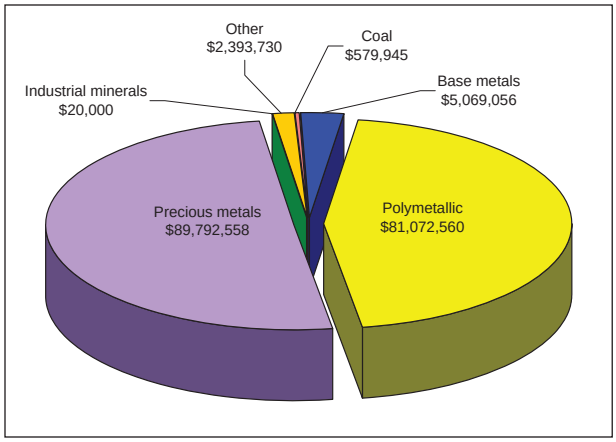


Figure 7. *Exploration expenditures in Alaska in 2006 by commodity.*

Table 4. *Reported exploration expenditures in Alaska by commodity, 1981–2006*

	Base metals	Polymetallic[a]	Precious metals[b]	Industrial minerals	Coal and peat	Other[c]	Total
1981	$28,262,200	N/A	$35,273,200	$10,300,000	$2,341,000	$127,000	$76,303,400
1982	31,757,900	N/A	10,944,100	- -	2,900,000	15,300	45,617,300
1983	9,758,760	N/A	20,897,555	2,068,300	1,338,454	70,000	34,133,069
1984	4,720,596	N/A	14,948,554	270,000	2,065,000	279,500	22,283,650
1985	2,397,600	N/A	6,482,400	- -	270,000	- -	9,150,000
1986	1,847,660	N/A	6,107,084	170,000	790,000	- -	8,914,744
1987	2,523,350	N/A	11,743,711	286,000	1,150,000	31,000	15,734,061
1988	1,208,000	N/A	41,370,600	160,200	2,730,000	- -	45,468,800
1989	3,503,000	N/A	43,205,300	125,000	924,296	5,000	47,762,596
1990	5,282,200	N/A	57,185,394	370,000	321,000	97,000	63,255,594
1991	4,789,500	N/A	34,422,039	92,000	603,000	2,000	39,908,539
1992	1,116,000	3,560,000	25,083,000	25,000	425,000	- -	30,209,000
1993	910,000	5,676,743	23,382,246	163,500	- -	125,000	30,257,489
1994	600,000	8,099,054	18,815,560	225,000	2,554,000	810,000	31,103,614
1995	2,770,000	10,550,000	20,883,100	100,000	- -	3,000	34,306,100
1996	1,100,000	11,983,364	31,238,600	400,000	- -	- -	44,721,964
1997	1,700,000	22,347,000	32,960,500	80,000	720,000	- -	57,807,500
1998	1,000,000	13,727,000	42,441,000	12,000	87,000	- -	57,267,000
1999	3,869,000	3,168,000	44,891,000	1,000	- -	410,000	52,339,000
2000	8,545,000	3,933,000	21,579,000	58,500	- -	736,100	34,851,600
2001	4,810,000	1,977,000	15,820,000	50,000	10,000	1,106,000	23,773,000
2002	1,700,000	5,162,000	17,342,000	185,000	- -	2,113,000	26,502,000
2003	262,000	7,081,000	19,726,000	- -	W	533,000	27,602,000
2004	3,100,000	40,237,000	26,954,000	213,000	50,000	258,000	70,812,000
2005	1,764,000	54,271,000	46,255,000	142,000	- -	1,463,000	103,895,000
2006	5,069,056	81,072,560	89,792,558	20,000	2,393,730	579,945	178,927,850
Total	**$134,365,822**	**$272,844,721**	**$759,743,501**	**$15,516,500**	**$21,672,480**	**$8,763,845**	**$1,212,906,870**

[a]Polymetallic deposits considered a separate category for the first time in 1992.
[b]Approximately $1.4 M spent on platinum-group-element exploration during 2006 ($4.4 M in 2005,$3.4 M in 2004, $2.4 M in 2003, $650,000 in 2002, $2 M in 2001).
[c]Includes diamonds and tantalum
N/A = Not available.
- - = Not reported.
W = Withheld; data included in "Other" column.

deposits ($66.8 million) and porphyry copper–gold deposits ($67.3 million). More than $20.9 million was spent on various gold–quartz vein deposits, $18.8 million was spent exploring for polymetallic massive-sulfide deposits, and $5.1 million was spent on platinum-group-element ultramafic deposits, epithermal gold deposits, uranium deposits, diamond, tin, coal, and other deposit types.

Advanced exploration projects include Barrick Gold Corp.–NovaGold Resources Inc.–Calista Corp.'s 33.7-million-ounce Donlin Creek intrusion-hosted gold project and Northern Dynasty Minerals Ltd.'s Pebble copper–gold porphyry project in southwestern Alaska. The Pebble project, with newly announced mineral resources of 67 billion pounds of copper, 82 million ounces of gold, and 5.2 billion pounds of molybdenum, was the largest Alaska mineral exploration project in 2006.

Figure 9 is a graph of mineral exploration expenditures in Alaska from 1956 to 2006. Exploration expenditures per year are shown with raw (not adjusted for inflation) and adjusted values (inflation adjusted to 2006 dollars). Exploration expenditures and employment by region are detailed in table 3.

Table 5 summarizes the number of new and active (new plus existing) mining claims per year, from 1991 to 2006. The table lists the number of 20-acre federal mining claims, 160-acre state prospecting sites, and 40- or 160-acre state mining claims. About 6,858 new state mining claims (963,960 acres), 103 new state prospecting sites (16,480 acres), and 457 new federal claims (9,140 acres) were staked in 2006. State claim staking increased 23 percent from 2005 levels, while the number of new federal mining claims increased dramatically from 2004 levels to slightly above the average value in the past 5 years. The number of active 160-acre state claims increased 110 percent from 2004 to 2006. State mining leases covered 70,417 acres of land and offshore mining leases or permits totaled 131,841 acres. The amount of land in Alaska under claim increased from 2005 to 2006, with approximately 4.44 million acres of land covered by claims and prospecting sites in 2006. This acreage is an increase of 16 percent from 2005 levels and the largest amount of land covered by mining claims, prospecting sites, and mining leases for the past decade. Alaska had 7,805 active federal mining claims in early 2007.

Prospecting sites and mining claims were staked across Alaska, with detailed information listed in Appendices A and B. Several large blocks of mining claims were staked in 2006. NovaGold Resources Inc. and Andover Ventures Inc. staked claims in the Ambler mineral belt of the Brooks Range over ground prospective for volcanogenic massive sulfides. Linux Gold Corp. staked a large claim block expanding their holdings near Granite Mountain in the Candle Quadrangle. International Tower Hill Mines Ltd. staked 48 square miles covering prospective ground adjacent to their Chisna property. Shulin Lake Mining Co. staked 231 State mining claims in the Yenlo Hills as part of their diamond exploration program. Alaska Earth Resources staked two hundred five 160-acre claims (32,800 acres) in the Moore Creek area of southwestern Alaska and NovaGold staked

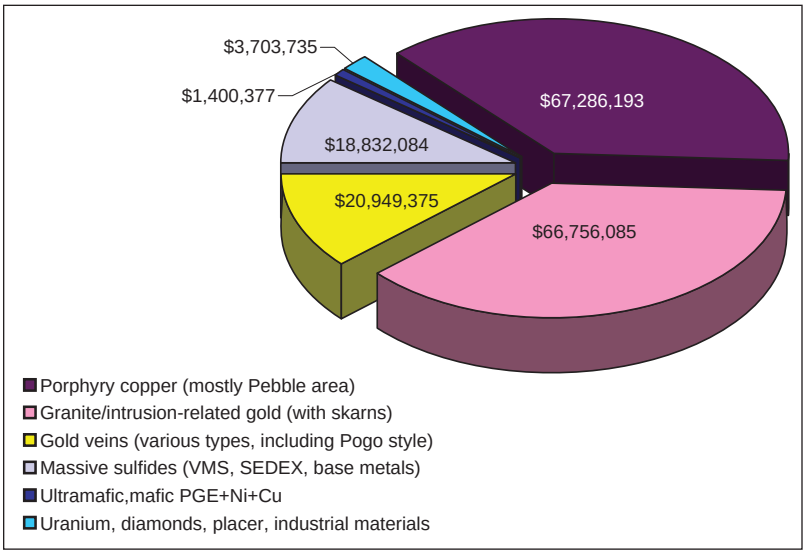


Figure 8. *2006 Alaska exploration expenditures by deposit type.*

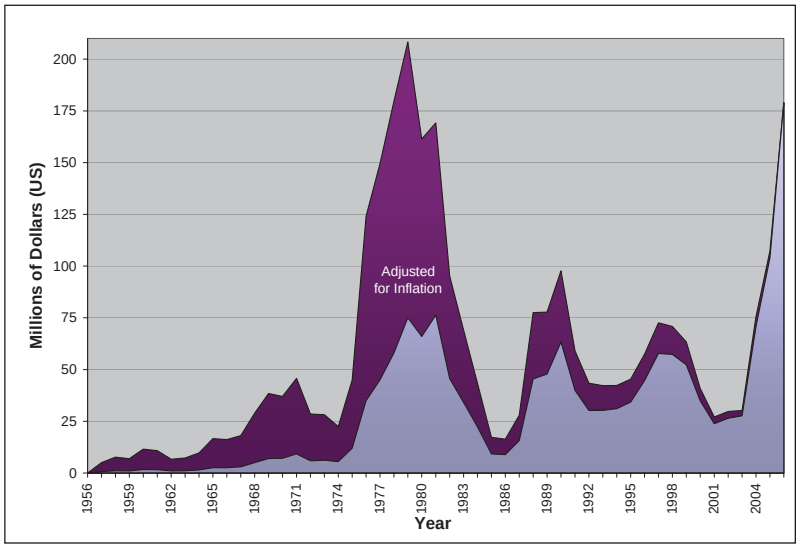


Figure 9. *Alaska mineral exploration expenditures, 1956–2006. Inflation adjusted to 2006 dollars.*

90,000 acres over four prospects south of the Donlin Creek property. Tower Hill staked 27 square miles of state land in the McGrath mining district over a number of historic prospects discovered by the Anaconda Co. in the 1970s and 1980s. Gold Crest Mines Inc. staked 22,500 acres of state land near Nyac.

NORTHERN REGION

Teck Cominco Alaska Inc. completed 79 core holes at the Aqqaluk deposit to better define the deposit, but assay results were not released. Probable reserves and mineralization modeling will be updated after all assays are received. Several priority exploration targets remain around the mineralized systems at Anarraaq, Aktigiruk, Paalaaq and Su Lik and these targets may be drilled in 2007. Teck also spent $9.2 million in 2006 exploring for natural gas as a replacement for diesel fuel for power generation, but the shallow-gas drilling program suffered technical setbacks.

NovaGold Resources Inc., in joint venture with Rio Tinto plc, continued exploration at the Ambler Project. NovaGold collected 2,106 stream silt and soil samples and conducted 13 time–domain electromagnetic (TDEM) surveys. Core drilling totaling 9,876 feet in 12 holes was completed at the Dead Creek, Sunshine, Red, and Center of the Universe (COU) prospects (fig. 10). The drilling confirmed additional high-grade copper and precious-metal mineralization, with new crosscutting high-grade zinc–lead–copper veins discovered at the Red prospect, about 2 miles east of the Arctic prospect. Drilling at the Sunshine prospect indicates that base-metal mineralization grades laterally to massive pyrrhotite. Exploration work continued on a major geophysical anomaly identified the previous year at the COU prospect. Geological studies refined the structural emplacement of the massive-sulfide zones in a regional fold belt. An updated resource estimate reports an inferred resource of 1.6 billion pounds of copper, 32.7 million ounces of silver, and 0.4 million ounces of gold. NovaGold significantly expanded its claim holdings in the district to more than 145 square miles. NovaGold also completed a preliminary study of power alternatives for the Ambler project, including wind and hydroelectric cogeneration from nearby sources.

NovaGold holds 55,000 acres of claims at the Baird Mountains prospects in the western Brooks Range. Multiple high-grade copper–zinc and precious-metal targets were identified through historical work. Historical shallow drilling intersections graded up to 9 percent copper over 20 feet and 3 percent copper over 118 feet. NovaGold performed airborne geophysical surveys over the property in 2006. The planned 2007 exploration program includes mapping, sampling, and 4,900 feet of core drilling.

The 2006 exploration program of the Little Squaw Gold Mining Co. consisted of geological studies and mapping, prospect evaluation on 38 presently known gold prospects in the Chandalar mining district, and a 7,763-foot reverse-

Table 5. *Summary of claim activity in Alaska by acres, 1991–2006*

	State Claims				State Prospecting Sites		Federal Claims	
Year	New 40 acre	New 160 acre	Total (Active) 40 acre	Total (Active) 160 acre	New 160 acre	Total (Active) 160 acre	New ~20 acre	Total (Active) ~20 acre
1991	3,277	0	37,862	0	747	1,723	1,299	23,222
1992	2,640	0	36,250	0	454	1,472	695	20,254
1993	2,120	0	34,340	0	1,412	2,259	601	9,298
1994	4,057	0	34,400	0	802	2,378	341	8,495
1995	4,512	0	30,464	0	1,030	2,725	376	7,766
1996	9,489	0	36,602	0	2,082	3,687	681	9,346
1997	8,678	0	42,836	0	2,480	5,305	1,872	11,320
1998	9,786	0	49,816	0	3,194	7,148	427	11,033
1999	11,978	0	56,107	0	1,755	7,600	308	10,176
2000	4,560	614	54,393	614	1,143	5,675	523	7,805
2001	858	907	49,627	1,503	27	3,091	464	8,248
2002	745	826	44,056	2,179	61	2,138	261	8,100
2003	856	2,603	38,076	4,387	101	1,857	676	8,424
2004	1,070	3,533	34,380	7,719	59	1,484	66	8,313
2005	806	4,502	34,066	11,551	128	1,612	411	8,200[a]
2006	1,111	5,747	33,864	16,249	103	1,646	457	7,805[a]

Information provided by Jack Davis (Land Records Information Section, DNR) and Robert Brumbaugh, Karon Goslin, and John Hoppe (USBLM). Table has been reorganized to conform with computer records available after 1990.
[a]Estimated.

Figure 10. *NovaGold Resources Inc. drilled several prospects on the Ambler Project in the southern Brooks Range. Photo provided by NovaGold.*

circulation drill program that drilled nine prospects. Drill results included a quartz vein intercept on the Eneveloe prospect of 25 feet of 0.171 ounces of gold per ton, including 5 feet of 0.742 ounces of gold per ton. Drilling results at the Kiska prospect included a 10-foot intercept in hole KIS 17 of 0.032 ounces of gold per ton. All drill holes that penetrated their targets at the Summit and Little Squaw prospects had gold-bearing intercepts. Assay results confirm continuity of gold mineralization to the depth of drilling, which is 200 feet below surface. Drilling and systematic soil and rock sampling confirm that individual gold-bearing quartz veins and shear zones persist over several thousand feet of strike length. The Summit drill holes (SUM 6–12) had 5- to 10-foot mineralized intercepts with values ranging from 0.095 to 0.264 ounces of gold per ton, including a 5-foot intercept of 0.457 ounces of gold per ton in hole SUM 8. Best results from the Little Squaw drill holes (LS 1–5) were 25 feet grading 0.123 ounces of gold per ton, including 5 feet of 0.314 ounces of gold per ton in hole LS 2. Hole LS 5 had a 5-foot intercept grading 0.1 ounces of gold per ton and the other drill holes had short intercepts of low-grade gold mineralization.

A placer gold evaluation of the Little Squaw property indicates excellent potential for additional placer gold deposits in bench placer deposits along Little Squaw Creek. Drilling was recommended to quantify the potential placer gold resources.

Silverado Gold Mines Ltd. dug 920 feet of trench with a backhoe in an area north of Smith Creek on the Nolan Creek property. This area is part of the Solomon Shear, a 5-mile-long gold-bearing shear zone, interpreted by Silverado to be part of the source area of placer gold in the Nolan Creek area. Trenching successfully identified three zones that contain gold–antimony–quartz veins. The "main zone" contained 16 veins over a 190-foot width. Individual gold–antimony–quartz veins vary in width from one-quarter inch to 7 inches. Spacing of veins also varies, from one-quarter inch to several feet. A total of 71 combined chip and channel rock samples were collected during the trenching program and 32 samples had gold values exceeding 0.01 ounces of gold per ton, up to 0.83 ounces of gold per ton. Twelve trench samples had high antimony values ranging from 6.59 to 46.33 percent.

Silverado also drilled one reverse-circulation drill hole north of Smith Creek. Drill hole 06SH01 confirmed the presence of gold–antimony–quartz veins to a vertical depth of 210 feet over a projected horizontal width of 125 feet. Ten of 57 five-foot samples had gold values greater than 0.01 ounces of gold per ton, ranging up to 0.06 ounces of gold per ton. Antimony values ranged up to 2.51 percent. Silverado also completed 39 reverse-circulation drill holes on the Slisco Bench along the Hammond River for placer gold exploration. All holes penetrated bedrock for a total of 4,782 feet drilled. Samples were processed through an on-site Denver Gold Saver to produce mineral concentrates (sulfides, heavy rock particles, and gold) that were panned and assayed. Drill results confirm the presence of gold in areas of previous drilling and have identified a channel containing placer gold that extends for a length of more than 1,800 feet. The channel remains open to the southeast and there is evidence of one or more tributary channels that remain to be explored. Within the Slisco channel, the placer gold occurs on bedrock and on a second horizon about 20 feet above the bedrock channel. Placer gold pay ranged from 5 to 10 feet thick, with visible gold nuggets and gold grades ranging from 0.009 to 0.495 ounces per bank cubic yard.

Silverado acquired 13 federal placer claims and 237 federal lode claims near the Nolan Creek property, increasing the total claim area to more than 11 square miles. Exploration drilling was also done on Silverado's newly acquired placer claims, in particular the Topnotch prospect. A total of nine holes were drilled, of which two holes yielded placer gold values greater than 0.01 ounces per bank cubic yard for a 5-foot sample. Bedrock is shallow at the Topnotch prospect and potential placer deposits could be accessed by open-pit mining.

Andover Ventures Inc. acquired a 50 percent interest in the Sun mining claims in the Ambler mineral belt. The purchase price was $2.6 million and the seller, Hastings Base Metals Corp., retains a 1.5 percent net smelter return. Andover also obtained an option to acquire the remaining 50 percent interest for a purchase price of $9 million payable in cash or shares. The Sun property consists of a total of 25 mining claims with mineralization defined by historical drilling for approximately 2 miles along strike. Mineralization consists of up to three volcanogenic mas-

sive-sulfide (VMS) horizons up to 38 feet thick, with average grades of 1 to 4 percent lead, 6 to 12 percent zinc, 0.5 to 7 percent copper, and 3 to 10 ounces of silver per ton. The favorable host rocks are schistose metafelsic volcanic, tuffaceous, and sedimentary rocks occurring in an isoclinally folded linear belt. Andover staked an additional sixty-eight 160-acre State claims along 10 miles of the highly prospective metavolcanic belt.

Arctic Slope Regional Corp. and BHP Billiton Ltd. signed a series of agreements providing BHP Billiton an exclusive right to explore and possibly develop the coal-bearing land held by Arctic Slope Regional Corp. in northwestern Alaska. The western Arctic region includes a number of known low-sulfur bituminous coal-bearing areas. BHP Billiton conducted an exploration program inland from the Inupiat communities of Point Lay and Point Hope.

WESTERN REGION

NovaGold Resources Inc. drilled the Big Hurrah property east of Nome to include a higher-grade resource in the proposed Rock Creek mine plan. Environmental baseline work continued for the Rock Creek permit process. A total of 32,500 feet of drilling was planned at the Big Hurrah and Rock Creek areas to expand gold resources at these deposits. Limited drilling at the Rock Creek property occurred along the northern highwall of the deposit and immediate extension of the tension veins farther to the south on the southern margin of the deposit and across the Sophie Gulch fault. A new gold resource calculation estimates indicated resources of 677,000 ounces of gold and an additional inferred resource of 100,000 ounces of gold, with indicated resources of 10.6 million tons grading 0.038 ounces of gold per ton and inferred resources of 1.54 million tons grading 0.028 ounces of gold per ton at the Rock Creek deposit, and indicated resources of 1.98 million tons grading 0.134 ounces of gold per ton and inferred resources of 661,000 tons grading 0.089 ounces of gold per ton at the Big Hurrah deposit.

NovaGold also continued exploring the Khotol project near the Yukon River northeast of the reclaimed Illinois Creek open-pit gold mine. High-grade silver and associated base-metal mineralization occurs as disseminated to massive sulfide replacement-style bodies along a regional dolomitic limestone–quartzite contact. Drilling was planned but no results were announced.

NovaGold controls 118,000 acres of state mining claims at the Kugruk property on the northern Seward Peninsula, as well as leases on additional claims in the Independence mine area. The Kugruk property has widely distributed copper and high-grade silver–lead–zinc mineralization. NovaGold flew an airborne electromagnetic survey over the area in 2006 and plans to identify and prioritize targets for drill testing in 2007.

Triex Minerals Corp. (operator) and Full Metal Minerals Ltd. conducted exploration on the Boulder Creek (formerly called Death Valley) project, the largest known uranium deposit in Alaska (fig. 11). The project area is on the southeastern Seward Peninsula. The deposit is a sandstone-type 'roll-front' deposit with predominantly epigenetic mineralization. Uranium was leached from a Late Cretaceous alkalic quartz monzonite intrusion and deposited within a reducing environment of Paleocene, arkosic, carbonaceous conglomerates, and sandstones of the Boulder Creek Basin.

Fourteen core holes totaling 4,058 feet were completed in 2006 within and peripheral to the known limits of mineralization. Two holes completed in the core of the deposit confirmed the historic grade and thickness of the deposit. Hole DV06-54, in the core of the northern part of the deposit, contained 0.32 percent U_3O_8 over 20 feet between 75 and 95 foot depth, including 0.87 percent U_3O_8 over 6.5 feet. Hole DV06-64 contained 0.32 percent U_3O_8 over 6.5 feet within 16.4 feet of 0.17 percent U_3O_8 between 37.4 and 53.8 foot depth. Possible extensions of the deposit along strike to the north and south were not thoroughly explored. Two holes were completed at Carbon Creek, about

Figure 11. *Transporting supplies from Elim to Triex's Boulder Creek exploration sites. Photo courtesy of Full Metal Minerals Ltd.*

4.3 miles northwest along strike from the main deposit at Boulder Creek. These holes did not intersect significant uranium mineralization, but favorable host stratigraphy was confirmed. Extensive reconnaissance exploration in the Boulder Creek and McCarthy Marsh regions, including 1,862 line-miles of airborne radiometrics and collection of 475 rock, soil, and biogeochemical samples, successfully identified multiple new targets for detailed evaluation and potential drill-testing in 2007.

Mystery Creek Resources Inc., a subsidiary of St. Andrew Goldfields Ltd., continued exploration on the Nixon Fork gold–copper skarn property near McGrath. An underground winter 2006 diamond drilling program at the Mystery Creek deposit completed 11,484 feet of core drilling to delineate and confirm additional ore zones that will provide feed for the planned Nixon Fork mining operations.

Linux Gold Corp. continued exploring in the Granite Mountain area of the Seward Peninsula. Soil sample grids were completed on the Gossan Ridge subvolcanic gold–silver–copper prospect, the Quartz Creek plutonic gold–bismuth prospect, and the Saddle lead–silver–zinc vein prospect. Work on the Gossan Ridge soil grid outlined a gold–silver–lead–zinc anomaly over a 4,300 foot by 1,300 foot area. Reconnaissance exploration was conducted on the Peace molybdenum–uranium vein prospect, with analytical results ranging from 0.059 to 0.116 percent molybdenum, 65.8 to 131.9 parts per million (ppm) uranium, and up to 0.12 ounces of silver per ton. A drilling program of four core holes totaling 2,971 feet tested four mineralized zones on the Granite Mountain property. A total of 595 core samples, 640 soil samples, 61 rock samples, and five heavy mineral samples were collected and submitted for geochemical analysis. Geochemical results from rock and soil samples indicate new gold anomalies at the head of the Kiwalik River and on the lower reach of Quartz Creek. Geochemical results from rock samples from the Saddle prospect ranged up to 0.075 ounces of gold per ton, 7.292 ounces of silver per ton, and 3 percent combined lead and zinc. Soil sample results from the Saddle prospect defined a 5,000 foot by 700 foot anomaly with up to 148 parts per billion (ppb) gold and 0.37 ounces of silver per ton. Drilling verified base-metal mineralization at the Saddle prospect, with a 35-foot intercept in hole KW06-03 from 70 to 105 foot depth averaging 0.24 percent lead, 0.94 percent zinc, and 0.15 ounces of silver per ton. Stibnite-rich zones were found in drilling at the Quartz Creek prospect and the best intercept was 10 feet averaging 0.008 ounces of gold per ton and 0.27 ounces of silver per ton. Pan samples of alluvial deposits at Dime Creek revealed high-grade placer gold and platinum concentrations up to 0.086 ounces of gold per cubic yard and up to 0.27 ounces of platinum per ton, as well as visible gold grains, uranium values up to 186.2 parts per million, and thorium values up to 685.9 parts per million at the head of Quartz Creek. Linux staked an additional 136 mining claims in the area linking the Kiwalik and Peace claim blocks, for a total claim block of 68 square miles.

Quaterra Resources Inc. drilled the Big Bar copper–lead–zinc prospect on the Seward Peninsula. The 1,470-foot drilling program targeted a 4,000-foot-long soil anomaly. The anomaly contains up to 0.19 percent copper in felsic schist that corresponds to gravity and induced polarization (IP) geophysical anomalies. Gossan samples collected as float from the anomalous area contain up to 0.002 ounces of gold per ton, 1.45 ounces of silver per ton, 0.43 percent copper and 0.39 percent zinc. Drill holes BB06-1 and BB06-2 encountered an upper mineralized section in pervasively sericite-altered metavolcanic rock of upper greenschist to lower amphibolite metamorphic grade. Sulfide mineralization occurred in long intercepts of 1 to 5 percent sulfides, with disseminated and stringer pyrite and pyrrhotite and possible chalcopyrite in the upper 200 feet of the drilled section. Sulfide content was greatest in the top 100 feet and generally decreased downhole. No massive sulfides were encountered. Both holes appear to have tested a pyritic volcanogenic sulfide system that is either weak or distal to a vent. Assay results from the drilling program indicate that mineralization in each of the holes is subeconomic and does not extend to depth. Hole BB06-1 assayed 0.56 percent copper, 0.02 percent zinc, 0.02 percent lead, with trace amounts of gold and silver from the surface to a depth of 26 feet. Hole BB06-2 assayed 0.05 percent copper, 0.04 percent zinc, anomalous lead, and trace amounts of gold and silver from the surface to a depth of 46 feet. Mineralization in hole BB06-3 was restricted to the upper part of the hole with 0.46 percent copper, 0.03 percent zinc, 0.02 percent lead, and trace amounts of gold and silver from the surface to a depth of 7 feet.

Andover Ventures Inc., signed an option agreement with Altar Resources Alaska to acquire 100 percent of the Bulk Gold property north of Nome by incurring exploration expenditures totaling at least $2.9 million over 4 years, issuing stock, and making option payments totaling $500,000 over 5 years. Andover completed an eight-hole HQ core drilling program at the Big Pig and Dripping Gold targets. No significant gold mineralization was found in four drill holes at the Dripping Gold target. At the Big Pig target, two holes intersected sulfide mineralization consistent with mineralization encountered in a previous vertical core hole. Hole 06BGDH-5 intersected 40.5 feet of disseminated pyrite–arsenopyrite–stibnite mineralization from 23 to 63.5 foot depth. Sulfides occur as disseminated grains in schist, meta-granite, altered and brecciated carbonate, and within and along thin quartz–feldspar–carbonate veinlets. Hole 06BGDH-8 also intersected similar sulfide mineralization from 169.5 to 188.8 foot depth. Holes 06BGDH-6 and 06BGDH-7 were terminated at 19 and 29 feet, respectively,

in a barren marble horizon believed to be stratigraphically below mineralization.

Full Metal Minerals Ltd. entered into an agreement with Royal Pretoria Gold Ltd. to acquire 100 percent interest in the Inmachuck gold property. The property is road accessible from the town of Deering on the northern Seward Peninsula. Mineralization types present include structurally-controlled gold and carbonate replacement silver–lead–zinc prospects upstream from a placer district with historic placer gold production greater than 300,000 ounces. Full Metal mapped and collected 14 rock, 501 soil, 29 silt, and 453 mobile-metal-ion (MMI) samples. Significant carbonate-replacement mineralized zones were previously identified at Hannum and Harry's creeks in the 1960s. The occurrences are 4,300 feet apart and appear to be at the same stratigraphic level. The Hannum Creek prospect is typified by an extensive surface gossan. Historic channel samples collected from trenches completed by Bunker Hill Mining Co. in the 1960s include 15 percent lead, 1.5 percent zinc, 2.2 ounces of silver per ton, and 0.23 percent antimony over a 51-foot width. The Bunker Hill soil program identified an anomalous area 4,900 by 1,600 feet in which soils returned values greater than 250 ppm lead and 500 ppm zinc. In 1966, Bunker Hill completed 15 diamond core holes totaling 1,995 feet and encountered oxidized, sulfide-bearing carbonate rocks up to 250-foot depths. Work completed by Full Metal during 2006 identified a 3,600 by 1,300 foot northwest-trending silver–lead–zinc anomaly between Harry's Creek and Hannum Creek. Lead values ranged from trace to 4,220 ppm, while zinc values ranged from trace to 5,390 ppm. The soil anomaly is coincident with an electromagnetic conductor identified previously by Bunker Hill.

Full Metal also completed initial reconnaissance mapping and sampling at the Moore Creek intrusion-related gold prospect near McGrath. No exploration was conducted on the Ganes Creek gold property during 2006 after Fury Explorations Ltd. dropped its option.

Altar Resources drilled nine core holes on the Divide gold property north of Nome, but no results were announced (fig. 12). Placer gold exploration continued on several properties across the region. NovaGold conducted the most extensive work and updated the placer gold resource at its Nome operations to 1.5 million ounces of measured and indicated placer gold.

EASTERN INTERIOR REGION

Teck Cominco Inc. continued gold exploration on the Pogo property along the 8-mile-long trend of surface showings. More than 37,000 feet of core drilling was completed at the West Knoll, South Pogo, 4021, Cholla Ridge, Chorizo, Spring Grid, and Tam Ridge areas. No results were announced.

Rimfire Minerals Corp. conducted a mapping and reconnaissance geochemical silt sampling survey over the extensive land package (286 square miles) acquired by staking in the Goodpaster district near the LMS property. No results were announced. Tonogold Resources Inc. signed exploration agreements for the Rainbow–Aurora–Indian (Rainbow) gold properties west of the Pogo Mine. Copper Ridge Explorations Inc. also worked on the Ogopogo property in the Goodpaster area; several smaller projects were also ongoing.

International Tower Hill Mines Ltd., and its wholly-owned Alaska subsidiary, Talon Gold Alaska Inc., acquired

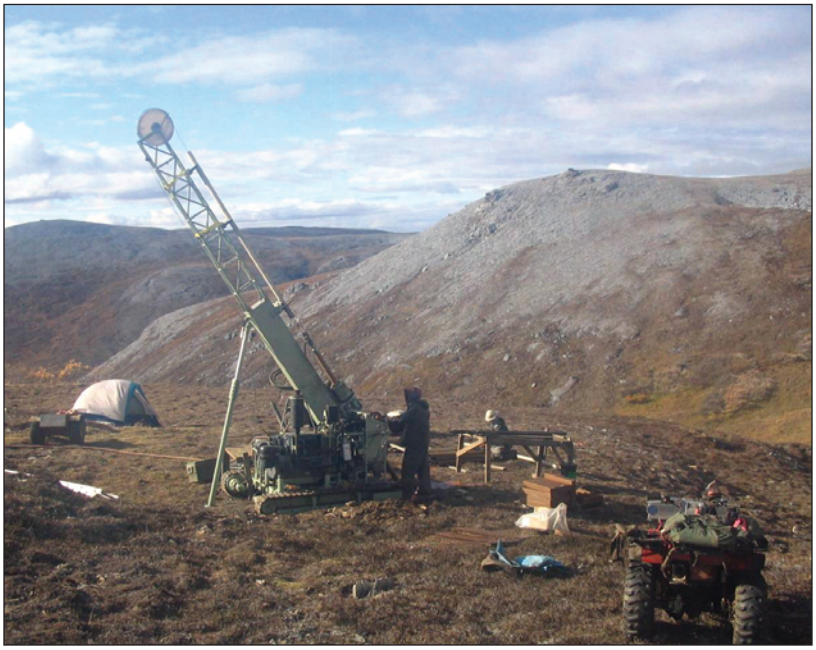


Figure 12. *Drilling at the Bulk Gold prospect. Photo provided by Altar Resources Alaska.*

all Alaskan mineral exploration properties and associated databases from AngloGold Ashanti (USA) Exploration Inc. Tower Hill also made a joint-venture agreement with AngloGold to earn a 60 percent interest in the LMS property (fig. 13). Soil geochemical sampling defined new targets along the mineralized trend, with a track-mounted auger rig drilling to 40-foot depths through loess and sand cover.

Figure 13. *Exploration drilling at the Camp zone on the LMS property. Photo courtesy of International Tower Hill Mines Ltd.*

A total of 19,636 feet of core was drilled in eight holes. Drilling expanded the previously defined breccia-hosted Camp zone mineralization, tested its lateral extents, and established structural controls on the high-grade gold veins. Significant drill intercepts include 18.7 feet grading 0.08 ounces of gold per ton and 0.47 ounces of silver per ton in hole LM-06-36, which was a 560-foot step-out from earlier drilling. In addition, high-grade zones were expanded with intercepts of 5.6 feet grading 0.35 ounces of gold per ton and 1.72 ounces of silver per ton in hole LM-06-31, 9.2 feet grading 0.85 ounces of gold per ton in hole LM-06-21, 13.1 feet grading 0.34 ounces of gold per ton in hole LM-06-26, and 1 foot grading 2.01 ounces of gold per ton and 0.55 ounces of silver per ton in hole LM-06-25. The Jolly's Cabin soil anomaly was tested with two drill holes that encountered veining and silver-rich mineralization.

Tower Hill acquired the Livengood project from AngloGold in August and then leased an additional 169 mining claims in the area from private parties. Tower Hill drilled 4,026 feet of core in seven holes (fig. 14). Higher-grade gold mineralization in quartz–arsenopyrite veinlets associated with a subvolcanic igneous breccia was intersected in hole MK-06-07, with 310.4 feet grading 0.05 ounces of gold per ton. Gold mineralization in igneous and metasedimentary rocks intersected in holes MK-06-05, MK-06-06, and MK-06-08 ranged from 0.01 to 0.02 ounces of gold per ton over widths from 16.4 to 95.1 feet. A gold characterization study contracted to Hazen Research Laboratories indicated that the bulk of the gold occurs as native gold grains ranging in size from 1 to 10 microns in and around arsenopyrite grains. Cyanide extraction of gold from sulfide material is in the 60 percent range.

Tower Hill also acquired the Coffee Dome, Gilles, West Pogo, Chisna, and Blackshell properties in its deal with AngloGold. Tower Hill conducted rock and soil sampling on these properties. A gold–arsenic soil anomaly with a strike length of more than 1,600 feet was delineated at the Coffee Dome property. At the Blackshell property, sampling (329 soil samples and 102 rock samples) confirmed the presence of quartz vein-style gold mineralization with narrow sericite alteration selvages hosted within a porphyritic phase of a multiphase intrusive complex. Gold is associated with high bismuth and very low arsenic values, and anomalous molybdenum and tungsten values. Gold mineralized veins have been found over a 0.75-square-mile area. Work on the Gilles project identified resistant silicified bedrock ribs associated with gold anomalies and 34 state mining claims were staked to the southwest of the property. Work at the West Pogo property confirmed the presence of an east–west structural zone with anomalous bismuth and weakly anomalous gold values.

Results from sampling on the Chisna property indicate that a 9.6-square-mile area in the central portion of the property has the potential to host a near-surface bulk tonnage copper–gold–silver deposit. Ninety stream-silt samples, 81 rock samples, and 87 soil samples were collected and analyzed. A total of 73 rock samples collected

Figure 14. *Reverse-circulation drilling, contracted to Layne Christensen Co., at Money Knob on the Livengood project. Photo courtesy of International Tower Hill Mines Ltd.*

from this area averaged 0.1 percent copper, 0.01 ounces of gold per ton, and 0.08 ounces of silver per ton, with 21 of these samples averaging 0.6 percent copper, 0.03 ounces of gold per ton and 0.24 ounces of silver per ton. The average values of soil samples taken on the project are 230 ppm copper, 31 ppb gold, and 0.5 ppm silver, with a range from 31 to 1,955 ppm copper, 2 to 255 ppb gold, and 0.1 to 2.4 ppm silver. Mineralization is hosted in Mankomen Group volcanic and sedimentary rocks underlying the Telena volcanic group and is associated with widespread silica–pyrite alteration zones within the volcanic sequence. This rock package hosts the world-class copper and copper–gold deposits at the Kennicott and Orange Hill deposits to the southeast. Tower Hill staked an additional 1,999 state mining claims covering 48 square miles and continued negotiations with surrounding land owners to expand the Chisna property.

Tower Hill made an exploration option/mining lease agreement with Doyon Ltd. for the West Tanana property, about 78 square miles of Doyon-controlled land along the Yukon River. Tower Hill is required to pay Doyon $350,000 over 6 years, make an annual $10,000 scholarship donation, and incur exploration expenditures totaling $2,625,000. Tower Hill collected 483 soil samples on the West Tanana property and outlined a large gold–arsenic–bismuth–tellurium anomaly adjacent to Monday Creek. Gold values in soil samples range from 3 ppb to 1.01 ppm. Regional prospecting was also conducted in the Racine Creek area.

Full Metal Minerals Ltd. signed an exploration agreement with Doyon Ltd. for 1,277 square miles of lands in the Fortymile area. Full Metal can earn 100 percent interest in the Fortymile property by spending $3.8 million on exploration and making cash payments totaling $385,000 over 6 years, including annual $10,000 scholarship payments. Doyon retains royalties on future production. Full Metal further delineated massive-sulfide mineralization on the Little White Man (LWM) and Fish prospects. The properties are about 4 miles apart and 24 miles west of the Taylor Highway. A ground-based gravity geophysical survey was completed at the LWM prospect. Diamond drilling at the LWM prospect targeted a 0.5 milligal gravity high identified during the survey, coinciding with a 1-mile by 1,200-foot, zinc–silver–lead soil anomaly defined by 92 soil samples. A total of seven historic grab samples of gossan recovered from surface soil pits averaged 5.0 percent zinc, 11.85 percent lead, 0.5 percent copper, and 3.08 ounces of silver per ton. Hole LWM06-01 intersected coarse-grained, banded, massive pyrite, chalcopyrite, sphalerite, and galena at 100-foot depth hosted within brecciated and locally silicified argillite with altered felsic dikes or flows. Mineralization is interpreted to be a gently dipping massive-sulfide body, with 39.7 feet of 3.24 ounces of silver per ton, 0.32 percent copper, 4.0 percent lead, and 15.7 percent zinc, including 21.7 feet grading 5.86 ounces of silver per ton, 0.56 percent copper, 7.2 percent lead, and 27.0 percent zinc and a 10.8-foot section of massive sphalerite averaging 43.7 percent zinc. Hole LWM06-02 intersected 41 feet of oxidized mineralization starting at a 102-foot depth averaging 1.08 ounces of silver per ton, 0.05 percent copper, 2.94 percent lead, and 2.79 percent zinc, including 7.9 feet grading 5.54 ounces of silver per ton, 0.23 percent copper, 15.2 percent lead, and 2.98 percent zinc. Hole LWM06-03 may have been collared in the footwall of the massive-sulfide horizon, with a 26.2-foot interval starting at a 144-foot depth averaging 3.22 percent zinc with negligible values for other metals.

Seven drill holes were also completed at the nearby Fish prospect, approximately 3.5 miles east of the LWM prospect (fig. 15). Drilling tested an extensive 50- to 75-foot-thick gossan interpreted be derived from intensely weathered massive to semi-massive sulfides with zoned zinc-, silver-, gold-, lead-, and copper-rich sections. The gossan was traced by previous workers for 4,900 feet along strike and 820 feet downdip with 71 rock samples averaging 4.5 percent zinc, 0.1 percent lead and 0.33 ounces of silver per ton. Drilling over a 1,600-foot strike length encountered strongly oxidized massive-sulfide mineralization including 12.3 percent zinc over 29.5 feet in hole Fish 06-06 and 9.0 percent zinc over 35.8 feet in hole Fish 06-05. Hole Fish 06-06 encountered primary massive-sulfide mineralization (26.9 feet grading 0.03 ounces of gold per ton and 3.47 ounces of silver per ton) starting at 679.5 feet below surface. The thickest mineralized intercepts are 145.7 feet grading 1.00 ounces of silver per ton, 0.10 percent copper, 0.09 percent lead, and 3.3 percent zinc in hole Fish 06-05, 92.2 feet grading 0.007 ounces of gold per ton, 0.24 ounces of silver per ton, 0.08 percent copper, and 4.9 percent zinc in hole Fish 06-06, and 67.6 feet grading 1.52 ounces of

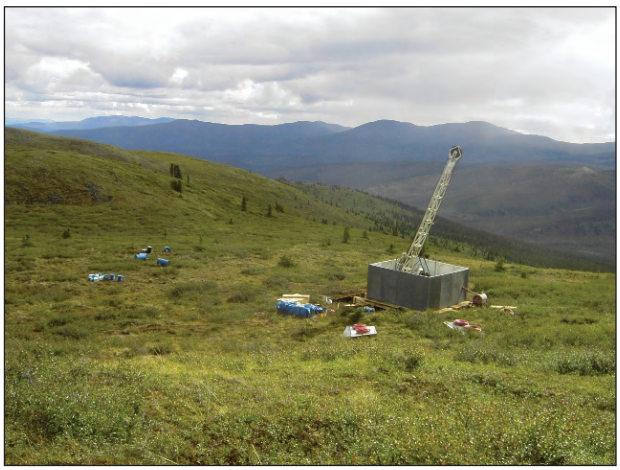


Figure 15. *Drilling gossanous polymetallic mineralization in the Fortymile mining district at the Fish prospect. Photo provided by Full Metal Minerals Ltd.*

silver per ton, 0.06 percent copper, 0.08 percent lead, and 1.7 percent zinc in hole Fish 06-07. Holes Fish 06-01 and Fish 06-02 intersected oxidized mineralization starting at 21-foot depth, with 36 feet grading 5.98 ounces of silver per ton, 0.11 percent copper, and 4.2 percent zinc in hole Fish 06-01, and 42 feet grading 5.29 ounces of silver per ton, 0.09 percent copper, 0.41 percent lead, and 4.0 percent zinc in hole Fish 06-01.Mineralization remains open to the south, north, and at depth.

Kinross Gold Inc. continued an exploration drilling program in and around the existing Fort Knox open-pit gold mine near Fairbanks. Kinross also drilled geophysical anomalies at the Last Chance Creek area on the nearby Gil gold property held in joint venture with Teryl Resources Corp. Kinross completed 1,820 feet of reverse-circulation drilling and collected 76 soil and rock samples on the Gil property. The best drill results were from siliceous quartzite intersected in hole GVR06-496, with the interval from 120- to 125-foot depth assaying 0.0185 ounces of gold per ton and the interval from 560 to 565 feet assaying 0.0612 ounces of gold per ton.

Freegold Ventures Ltd. discovered new high-grade gold veins in a 4,700-foot trenching program at its Golden Summit property near Fairbanks (fig. 16). Ten trenches near the historic Beistline shaft tested the eastern extension of the historic Cleary Hill underground mine, and to the west six trenches were completed over the Wackwitz vein and three trenches were completed on the Colorado vein to further delineate veins and shear zones discovered last fall. Results from trenching in the Beistline shaft area include 185 feet of strike length of a 4- to 8-inch-wide quartz vein grading 1.15 ounces of gold per ton, including a 75-foot section grading 2.4 ounces of gold per ton. A new 5-foot-wide zone of the Wackwitz vein averaged 0.48 ounces of gold per ton over 235 feet, including 85 feet grading 1.01 ounces of gold per ton and 50 feet grading 1.5 ounces of gold per ton. A new 10- to 15-foot-wide shear zone, named the Currey zone, was discovered 50 feet south of the Wackwitz vein and samples collected over 220 feet of strike length averaged 0.065 ounces of gold per ton. A 10,000-ton bulk sample was collected from nine locations on the property to be processed in the spring of 2007. Results from the bulk sampling program indicate that gold mineralization is not limited to the narrow high-grade quartz veins mined selectively in the past, but is also present in smaller quartz veins in both the hanging and footwall zones. Construction of a new haul road to transport the bulk mined material exposed new veins, and additional cross-trenching in the area led to the discovery of a number of new veins and shear zones to the south of the Cleary Hill vein system. The Cleary Hill vein system was also trenched approximately 1,200 feet west of the Beistline shaft area, directly above the old underground workings. A 25,000-foot reverse-circulation drill program began in December to test mineralization in the quartz vein swarms by a series of shallow drill holes in a series of fences.

Figure 16. *High-grade gold mineralization, quartz veins, and altered wallrocks exposed during an extensive trenching program on Cleary Summit. Photo by Chris Van Treeck, provided courtesy of Freegold Ventures Ltd.*

Minor work was completed on the Christina vein system on Cleary Summit by Andy Miscovich and partners. Gold mineralization at the Christina Vein is the same style as that described above on the Golden Summit property. Metallic screen assays indicate that most of the gold is in the plus 150-mesh fraction of the submitted samples. Preliminary cyanidation bottle roll tests were encouraging, with high gold recoveries after 12 hours of leaching and greater than 95 percent gold recovery after 72 hours of leaching. The group is looking for joint-venture partners to conduct further exploration.

Midas Resources Ltd., through its subsidiary Genesee Gold Mines LLC, explored the Uncle Sam property with a 2,726-foot drill program as part of a joint-venture agreement with Geoinformatics Exploration Inc. Five out of seven reverse-circulation drill holes intersected gold mineralization including 40 feet grading 0.043 ounces of gold per ton starting at 189.6 foot depth in hole USR055 and 20 feet grading 0.034 ounces of gold per ton starting at 305-foot depth in hole USR056. Gold mineralization

was found in quartz stockwork veins with pyrite, arsenopyrite, stibnite, and pyrrhotite in sericite-altered quartz mica schist. The two unmineralized drill holes were also the holes farthest from a granite intrusion, suggesting that grade is increasing toward the granite contact. All holes intersected a major structure and the downdip projection of this structure is interpreted to intersect a granite intrusion at a depth of 650 feet. This structural style is interpreted to be very similar to the structural setting of a Fort Knox type gold deposit.

Linux Gold Corp. located six new geophysical targets on the Fish Creek property near Fairbanks. A drill program was planned for the winter. Linux also staked 10 square miles of mining claims in the Livengood–Tolovana mining district.

Other exploration programs were conducted by Pathfinder Mineral Services in the Stone Boy Creek area near Pogo and Usibelli Coal Mine Inc. near Healy. Rhyolite Resources Ltd., in an option agreement with Grayd Resource Corp., conducted geologic mapping, rock sampling, and a gravity geophysical survey on the Super Cub area of the Delta property near Tok. Rhyolite Resources completed a total of 140 gravity stations along five lines totaling 2.5 miles in length. A 1.2-milligal gravity anomaly was present uphill of high-grade massive-sulfide boulders in a talus-covered area.

DGGS contracted an airborne geophysical survey over much of the Bonnifield mining district, with a mid 2007 expected release date of the data. Minor placer gold exploration occurred on numerous properties across the region. One of the largest programs was a stripping and bulk sampling program conducted by Northridge Exploration on American Creek in the Hot Springs mining district.

SOUTHCENTRAL REGION

Kennecott Exploration Co. continued exploring copper–gold targets on the Whistler property near Rainy Pass. An extensive core drilling program was continued, but no results were announced. Kennecott has identified at least eight targets similar to the Whistler prospect in the surrounding area. Hidefield Gold (Alaska) Inc. and other companies explored polymetallic mineralization related to composite alkalic intrusions of late Cretaceous age in the Mt. Estelle area to the west of Kennecott's Whistler property. Hidefield collected 463 rock samples in a two-week reconnaissance program and announced analytical results up to 3.15 ounces of gold per ton, 11.2 ounces of silver per ton, 6.3 percent copper and strongly enriched arsenic, bismuth, cobalt, molybdenum, antimony, and tungsten values.

Hidefield acquired all of Piper Capital Inc.'s interests in the Golden Zone and the South Estelle projects in April. Hidefield continued exploring the Golden Zone gold–silver–copper deposit (fig. 17). Reverse-circulation and core drilling were conducted in the Golden Zone breccia and several of the surrounding prospects, but no results were announced. Geochemical sampling, an induced polarization (IP) geophysical survey, and 5,000 feet of trenching were also conducted on portions of the property.

Full Metal Minerals continued exploring the historic Lucky Shot gold mine property in the Willow Creek mining district (fig. 18). The property has excellent access to roads, infrastructure, and power. Gold-bearing quartz veins and structures at Lucky Shot occur within a granitoid batholith. A total of 73 drill holes and 41,672 feet of drilling were completed on the Lucky Shot property in 2006, with drilling focused on the Coleman block portion of the Lucky Shot shear zone and eight holes in the Nippon vein. Drilling was performed by contractor Peak Exploration Ltd. The drilling targeted the Lucky Shot shear zone up to 1,000 feet updip from historic underground workings, as well as a newly discovered extension 320 feet downdip from the historic stopes, with about 850 feet of strike extent of the Coleman block drilled at 82-foot centers. Some drill results include hole C06-16 with 1.50 ounces of gold per ton over 15.1 feet, hole C06-19 with 3.93 ounces of gold per ton over 3.9 feet, hole C06-21 with 1.76 ounces of gold per ton over 8.2 feet, hole C06-23 with 0.96 ounces of gold per ton over 11.5 feet, hole C06-39 with 4.51 ounces of gold per ton over 1.3 feet, hole C06-60 with 0.34 ounces of gold per ton over 16 feet, hole C06-80 with 0.69 ounces of gold per ton over 5.6 feet, and hole C06-81 with 2.41 ounces of gold per ton over 5.6 feet. All intercepts are estimated true widths. The fault-offset northern extension to the Lucky Shot shear, named the Murphy Block, was discovered by drilling in the Craigie Creek valley, with hole C06-89 intersecting 0.56 ounces of gold per ton over 1.3 feet at a 1,000-foot depth, and extends the strike length of the Lucky Shot shear to at least 5,900 feet.

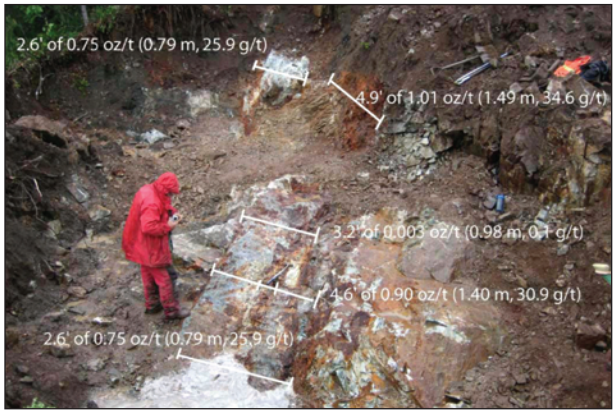


Figure 17. *Trenching and sample results on the Wells vein at the Golden Zone property. Photo provided by Hidefield Gold Inc.*

Anglo American Exploration (USA) Inc. explored the 150-square-mile Area 1 (Fish Lake–Dunite Hill area) of Nevada Star Resource Corp.'s 271-square-mile MAN property. Anglo American completed one core drill hole near the base of the Fish Lake Complex near 2005 drill hole 8 and two holes in the Tres Equis area. Drilling results were not announced, but Anglo American withdrew from the MAN project in August after spending in excess of $3 million over the past 2 years.

A joint venture between Golconda Resources Ltd., Shulin Lake Mining Co., and Shear Minerals Ltd. continued exploring the Shulin Lake property for diamonds with a four-hole core drilling program in early 2006. The first two holes went through 200 feet of volcanic ash into underlying Tertiary sandstone. Hole 3 collapsed and was abandoned at a 313-foot depth in a chaotic mixture of unconsolidated sand, gravel, and boulders. The last 10 feet of hole 3 contained pieces of possible welded tuff, a rock type not seen in previous drilling. Hole 4 was abandoned at 200 feet in unconsolidated material. All previous drill holes had a glacial till layer between zero and about 30 feet down. The large amount of unconsolidated, unsorted debris in this year's holes and possible welded tuff suggest close proximity to the feeder zone of this volcanic material. The last 10 feet of hole 3 were sampled for diamonds and diamond indicator minerals, but no analytical results were announced. Shulin Lake Mining also staked 231 mining claims in the Yenlo Hills.

Diamond Gold Corp. also explored for diamonds and other precious stones on their placer and lode properties in and near the Yenlo Hills. Diamond Gold drilled and hand mined 1,000 pounds of possible diamond-bearing rocks, interpreted to be lamproite pipes and dikes, in the headwaters of Sable Creek. Diamond Gold announced the recovery of a microdiamond (106 microns) by caustic fusion from a previous rock sample. Thirty-three pan concentrates were collected from Sable and Crystal creeks and one possible macro diamond was recovered. A sulfide body was also drilled in the northern Yenlo Hills and drilling intercepted 7 feet of quartz–carbonate–sulfide veinlets from 65 to 72 foot depth.

Figure 18. *Visible gold-bearing quartz vein in drill core from the Lucky Shot property. Photo courtesy of Full Metal Minerals Inc.*

Full Metal Minerals was awarded a coal lease by the Alaska Mental Health Land Trust that covers 35 square miles in the Chickaloon portion of the Matanuska Coal Field. The lease area includes Alaska's only known significant occurrences and past-producing operations of metallurgical coal. In October 2006, Afognak Native Corp. entered into an agreement with Full Metal to earn an interest in the Chickaloon project. Full Metal began permitting for a drilling program starting in May 2007.

Brett Resources Inc. staked and drilled the Coal Creek tin prospect, with four core holes totaling 2,390 feet. Three holes intersected cassiterite, arsenopyrite, and sphalerite in sheeted greisen bodies along an elongate granite porphyry stock. Hole Coal 06-43 graded 0.13 percent tin, 0.10 ounces of silver per ton, and 0.154 percent zinc from 390- to 775-foot depth, hole Coal 06-45 graded 0.08 percent tin, 0.12 ounces of silver per ton, and 0.13 percent zinc from 10.5- to 662-foot depth, and hole Coal 06-46 graded 0.10 percent tin, 0.19 ounces of silver per ton, and 0.07 percent zinc from 87- to 338.5-foot depth. Faulting and broken ground prevented completion of the planned drill program.

Full Metal Minerals optioned and staked claims comprising the Golddigger property in the Talkeetna Mountains. Limited exploration was completed on the King, Queen, Toklat, and Talkeetna prospects. Pacific Northwest Capital Inc. staked 46 mining claims in the Tonsina area.

Gold Cord Development Corp. extended a 5- by 7-foot exploration drift for 50 feet at the Gold Cord Mine in the Willow Creek area. Minor placer gold exploration occurred across the region.

SOUTHWESTERN REGION

Northern Dynasty Minerals Ltd. conducted the largest exploration project in Alaska during 2006 at the Pebble project on the north side of Lake Iliamna northwest of the villages of Iliamna and Newhalen within the Lake and Peninsula Borough. The project consists of 1,331 State of Alaska mining claims over copper–gold–molybdenum porphyry mineralization in calc-alkalic porphyry stock(s) and sedimentary host rocks with quartz stockwork veins containing principally pyrite, chalcopyrite, and molybdenite.

Previous work on the Pebble project defined the 4.52-billion-ton near-surface Pebble West deposit and the deeper but higher grade 1.98-billion-ton Pebble East deposit (fig. 19). Northern Dynasty continued preliminary engineering activities and environmental and socioeconomic studies and completed 74,000 feet of core drilling in 19 holes (numbered 6338 through 6356). Drilling was focused on determining the overall size, copper–gold–molybdenum grade distribution, and geometry of the world-class Pebble East deposit. Drill holes intersected long intervals of high-grade copper–gold–molybdenum mineralization, substantially expanding the Pebble East deposit beyond the boundaries of the previously announced resource. The north–south strike length of the Pebble East deposit was extended to more than 7,000 feet, with grades consistently exceeding 1 percent copper equivalent. The deposit remains open to the north and south across a width exceeding 4,000 feet. Importantly, significant amounts of high-grade copper minerals (predominantly bornite) were intersected in the northern- and southern- most holes drilled. The presence of significant bornite mineralization in these holes suggests their proximity to mineralizing centers.

Highlights from the drilling include hole 6338 intersecting 1,225 feet grading 1.29 percent copper equivalent (0.45 percent copper, 0.03 ounces of gold per ton, and 0.040 percent molybdenum); hole 6339 intersecting 2,051 feet grading 1.32 percent copper equivalent (0.84 percent copper, 0.01 ounces of gold per ton, and 0.032 percent molybdenum); hole 6348 intersecting 949 feet grading 1.92 percent copper equivalent (1.24 percent copper, 0.02 ounces of gold per ton, and 0.042 percent molybdenum); hole 6354 intersecting 705 feet grading 1.52 percent copper equivalent (1.23 percent copper, 0.008 ounces of gold per ton, and 0.020 percent molybdenum); and hole 6355 intersecting 2,252 feet grading 1.28 percent copper equivalent (0.70 percent copper, 0.015 ounces of gold per ton, and 0.046 percent molybdenum). Mineralization in all of these holes starts at depths greater than 1,395 feet.

During 2006, Kennecott Canada Exploration Inc. acquired a 9.9 percent interest in Northern Dynasty and increased that to a 19.79 percent interest in January 2007. Northern Dynasty announced a mineral resource estimate for the Pebble East deposit in early 2006 and then increased those resources by nearly 90 percent with a revised resource estimate in January 2007. At a 0.60 percent copper equivalent cutoff, as defined by Northern Dynasty, the estimated inferred mineral resources in the Pebble East deposit are 3.75 billion tons grading 1.00 percent copper equivalent (0.57 percent copper, 0.0105 ounces of gold per ton, and 0.036 percent molybdenum), containing 42.6 billion pounds of copper, 39.6 million ounces of gold, and 2.7 billion pounds of molybdenum. At a 1.00 percent copper equivalent cutoff, the estimated inferred mineral resources are 1.54 billion tons grading 1.29 percent copper equivalent (0.79 percent copper, 0.013 ounces of gold per ton, and 0.039 percent molybdenum), containing 24.6 billion pounds of copper, 20.9 million ounces of gold, and 1.2 billion pounds of molybdenum. The combined resources of the Pebble West and East deposits, 67 billion pounds of copper, 82 million ounces of gold, and 5.2 billion pounds of molybdenum, constitute one of the most significant metal accumulations in the world.

Northern Dynasty employed more than 700 employees and contractors, including 122 residents of Bristol Bay communities, on the Pebble project. Northern Dynasty spent more than $56 million on exploration activities, including $35 million on geology and engineering and $21 million on environmental and socioeconomic studies (fig. 20). More than 350 stakeholder meetings and briefings were held throughout the year. Northern Dynasty expects to continue exploration in 2007 at similar investment levels.

The Pebble project was the focus of extensive, at times intense, debate by pro-and anti-mining groups throughout Alaska and, to a lesser extent, nationwide. Debate about the project affected local elections in 2006 and was a campaign issue during the Alaska Governor's race. The project is located on State lands selected for their high mineral potential in the headwaters of some creeks and rivers that drain into Bristol Bay, which hosts the world's largest sockeye

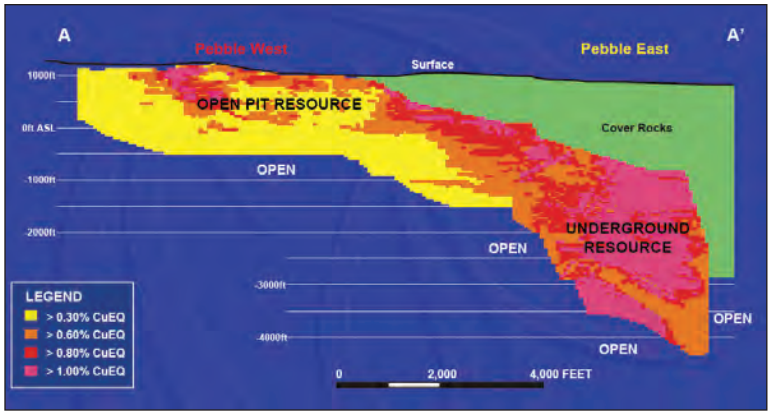


Figure 19. *Cross-section through the Pebble West and Pebble East deposits showing copper-equivalent grade of the porphyry mineralization. Note the higher grade of the mineralization in the Pebble East deposit beneath more than 1,000 feet of nonmineralized sediments and rock. Illustration from Northern Dynasty Minerals Ltd.*

Figure 20. *Environmental sampling and monitoring continued at the Pebble project during 2006. Photo provided by Northern Dynasty Minerals Ltd.*

salmon fishery. Opponents of the project contend that the project could damage Alaska's most lucrative commercial fishery as well as sport fishing and subsistence.

Barrick Gold Corp., after its merger with Placer Dome Inc., continued an extensive drill program on the Donlin Creek project near Aniak to progress to a completed feasibility study in November 2007. Barrick's joint-venture partners are NovaGold Resources, Calista Corp., and the Kuskokwim Corp. Eight diamond core drill rigs completed 304,500 feet of infill drilling in 327 holes (fig. 21). Drilling focused on converting inferred gold resources to measured and indicated gold resources. More than 33,000 feet of the drilling footage was completed for geotechnical testing, facilities condemnation, limestone resource definition, and metallurgical studies.

NovaGold Resources released some Donlin Creek drilling highlights. Drilling highlights from the Acma area include hole DC06-1129 with 13 mineralized intervals totaling 571 feet grading 0.09 ounces of gold per ton; hole DC06-1130 with 13 mineralized intervals totaling 702 feet grading 0.08 ounces of gold per ton; hole DC06-1131 with 12 mineralized intervals totaling 554 feet grading 0.12 ounces of gold per ton; and hole DC06-1133 with 14 mineralized intervals totaling 843 feet grading 0.11 ounces of gold per ton. Drill highlights from the Lewis area infill drilling include hole DC06-1255 with seven mineralized intervals totaling 358 feet grading 0.23 ounces of gold per ton; hole DC06-1283 with 13 mineralized intervals totaling 335 feet grading 0.12 ounces of gold per ton; hole DC06-1287 with 15 mineralized intervals totaling 413 feet grading 0.106 ounces of gold per ton; and hole DC06-1376 with 12 mineralized intervals totaling 341 feet grading 0.10 ounces of gold per ton. In addition, drilling showed that the Akivik, Aurora, Acma, East Acma, Vortex, Lewis, and South Lewis prospects remain open laterally and at depth. Hole DC06-1369, north of the Akivik zone and 1,600 feet north of the current modeled resource pit, intersected 118 feet grading 0.107 ounces of gold per ton in five intervals with northeast-trending dikes. Hole DC06-1245 in the East Acma area intersected 527 feet grading 0.107 ounces of gold per ton in nine intervals. Hole DCT06-1158, a geotechnical hole, intersected 51 feet grading 0.37 ounces of gold per ton in the south highwall of the modeled resource pit.

The camp at the Donlin Creek project was doubled, with the dining facility doubling in size, sleeping capacity increasing from 70 beds to 150 beds, and additional support facilities. More than 1.4 million pounds of cargo were shipped to the camp in 2006. New and returning employees totaled 168 and several times shift changes exceeded 75 people in one day. The project attained 93 percent Alaska Native hire. Twenty three villages in the Yukon Kuskokwim region had residents who worked on the Donlin Creek project during 2006. U.S. Senator Ted Stevens visited the Donlin Creek Project on October 17.

Figure 21. *Boart Longyear Co., under contract, drilled at the Donlin Creek property. Photo courtesy of Barrick Gold Corp.*

The Association of Village Council Presidents (AVCP), representing 56 Yukon–Kuskokwim region villages, voted unanimously at their 2006 annual convention to pass a resolution in support of the Donlin Creek Mine project to the extent that development can be done in an environmentally sound manner that preserves the integrity of the Kuskokwim River and its related subsistence resources. The resolution further states that the development of the Donlin Creek Mine must be done with maximum input and involvement from Kuskokwim River communities, especially those closest to the mine.

NovaGold contracted SRK Consulting (U.S.) Inc. to complete a preliminary economic assessment of the Donlin Creek project. The study confirmed the economics of a conventional open-pit mining operation at a production rate of 66,000 tons per day with the potential to produce on average 1.4 million ounces of gold per year over a 22-year project life at a cash cost of $276 per ounce of gold. SRK also estimated that the Donlin Creek property contains a measured and indicated resource of 16.6 million ounces of gold and an inferred resource of 17.1 million ounces of gold. The estimate was based on a cutoff grade of 0.022 ounces of gold per ton and a gold price of $500 per ounce. The Donlin Creek 33.7-million-ounce gold resource is one of the largest undeveloped gold resources in North America.

NovaGold staked four prospects totaling more than 141 square miles to the south of the Donlin Creek project. NovaGold plans exploration programs in the area during 2007.

Liberty Star Gold Corp. conducted limited fieldwork on the 421-square-mile Big Chunk project. Liberty Star dropped about half of their Big Chunk claim block by the end of the year. Liberty Star staked 69 additional State of Alaska mining claims at the Bonanza Hills gold project about 40 miles northeast of the northern boundary of the Big Chunk claim block to cover strong gold and geochemical indicator metal stream sediment anomalies found during 2005 fieldwork. Fieldwork was planned at the Bonanza Hill property, but no results were released.

International Tower Hill Mines Ltd. made a joint-venture agreement with AngloGold to earn a 60 percent interest in the Terra project northeast of Lime Village. High-grade quartz veins, up to 8 ounces of gold per ton in rock samples, occur along a 5-mile structural zone with porphyry–epithermal-style mineralization associated with the Terra Diorite. Tower Hill prospected the full strike length of the system and identified new high-grade gold veins during geologic mapping. A two-hole drilling program on the extension of the Ben vein intersected high-grade intervals from these holes drilled on a 500-foot stepout. Hole TR-06-16 had five mineralized intercepts starting at 263-foot depth ranging from 1 to 7.2 feet wide with grades from 0.11 to 0.45 ounces of gold per ton. Hole TR-06-17 had two gold intercepts, with the thickest intercept from 422- to 436-foot depth and grading 0.65 ounces of gold per ton. Tower Hill interprets drilling results as showing that the Ben Vein system widens to the northwest, and plans more drilling in 2007. Tower Hill collected 136 rock and rock chip channel samples, with values ranging up to 3.8 ounces of gold per ton and averaging 0.20 ounces of gold per ton and 0.98 ounces of silver per ton. Four main zones of veining are now defined in the core Terra target area, as well as a new zone of veining 2.5 miles to the south in the Ice Vein area (13 samples averaging 0.72 ounces of gold per ton and 4.96 ounces of silver per ton).

Tower Hill staked a block of 108 state mining claims covering 27 square miles in the McGrath mining district, 36 miles north of the Terra project. The BMP project area is underlain by Paleozoic sedimentary rocks and late Cretaceous to Tertiary volcanic and plutonic rocks. Mineralization styles in the area include skarns, intrusion-hosted veins and massive sediment-hosted mineralization of uncertain origin. The BMP project has a number of historic showings discovered by the Anaconda Co. in the 1970s and 1980s that contain high-grade copper, gold, silver, and zinc values. The main target is high-grade copper–silver mineralization such as that known from the Sheep Creek prospect just west of the BMP claims as well as gold, lead, and zinc mineralization.

TNR Gold Corp. expanded known intrusion-related gold mineralization at the Shotgun property with a drilling program (fig. 22). TNR completed a total of 6,168 feet of diamond drilling in 11 holes on the Winchester and Shotgun zones with two drill rigs. The best geochemical results were in hole DDH06-45 at Winchester and averaged 0.055

Figure 22. *The exploration camp at the Shotgun property. Photo provided by TNR Gold Corp.*

ounces of gold per ton over 77 feet; hole DDH06-53 with 44 feet averaging 0.036 ounces of gold per ton; and hole DDH06-50 with 40 feet averaging 0.041 ounces of gold per ton. Gold-bearing, light gray, fine- to medium-grained igneous sills ranging in thickness from 4 inches to more than 30 feet at the Winchester Zone cover a 1,500- by 1,100-foot area. Brecciation is an important component of the mineralization, and alteration includes ankerite, calcite, albite, and clays. Drillhole DDH06-43 at Shotgun Ridge averaged 0.038 ounces of gold per ton over 689 feet.

Tonogold Resources Inc., in a lease agreement with Calista Corp., continued gold exploration in the Nyac mining district. Mapping and geochemical sampling were done across the property, with 4,137 soil and 55 rock chip samples collected for analysis. High-grade quartz–chalcopyrite-pyrite veins were discovered at Saddle Mountain, with rock chip samples assaying up to 29 ounces of gold per ton. Tonogold drilled 11 core holes, totaling 8,383 feet, on Bonanza Ridge and the Wallace prospect, with partial results including a 2-foot intercept grading 0.25 ounces of gold per ton in hole 1.

Full Metal optioned its Kamishak copper–gold project to Andover Ventures. Andover can earn a 60 percent interest by incurring $2 million in exploration costs by 2010, issuing shares to Full Metal, and maintaining the mining claims in good standing, with some additional stipulations. A five-hole 2,925-foot core drilling program was completed. Drilling results confirmed the presence of porphyry style copper–gold mineralization, brecciation, and alteration. Drilling results include 241 feet starting at 93-foot depth averaging 0.31 percent copper and 0.008 ounces of gold per ton in hole KAS06-01, and 167 feet starting at 25-foot depth averaging 0.48 percent copper and 0.013 ounces of gold per ton in hole KAS06-04.

Pacific North West Capital Corp. signed an exploration and mining lease with Calista Corp. for the Goodnews Bay platinum property covering the Susie Mountain ultramafic complex and an 82-square-mile area of interest. Pacific North West must incur exploration expenditures of $1.95 million and make cash payments of $300,000 over 5 years, with additional terms including an annual $5,000 contribution to the Calista Corp. Scholarship Fund during the exploration phase of the agreement. Pacific North West collected power auger soil samples over a 1-square-mile area at Susie Mountain, pan concentrate samples from streams draining the Red Mountain massif, and rock samples in addition to reconnaissance-scale prospecting. Anomalous platinum values up to 268 ppb were found in soils overlying clinopyroxene-rich rocks on the southwest flank of Susie Mountain.

Brett Resources optioned the Sleitat Mountain tin property from Solomon Resources Ltd. Previous work had outlined significant tin mineralization as cassiterite in deeply eroded, steeply dipping greisen bodies adjacent to Tertiary granite. A five-corehole drilling program totaling 2,305 feet was completed. Significant results include 341 feet, starting at 10-foot depth, grading 0.24 percent tin and 0.19 ounces of silver per ton in hole Cass 06-10, and 206.5 feet, starting at 104.5-foot depth, grading 0.29 percent tin and 0.41 ounces of silver per ton in hole Cass 06-11. The mineralized system is interpreted to be at least 300 feet wide, 800 feet long, and extends to a 500-foot depth.

TNR Gold Corp. and Geocom Resources Inc. continued exploration at the D and H claims on the Iliamna project. Geocom planned a two-corehole drilling program on the D claims. No results were announced.

Andover Ventures Inc. entered into an exploration agreement with option to lease with the Bristol Bay Native Corp. (BBNC), an Alaska Native regional corporation. The agreement allows Andover to acquire a 100 percent interest in rights at five individual mineral properties covering more than 69 square miles in the Iliamna Lake area. The 7-year exploration agreement calls for total minimum exploration expenditures of $4.15 million, and option payments to BBNC totaling $875,000 ($90,000 first year). Additionally, Andover will make annual scholarship donations to the Bristol Bay Native Corp. Education Foundation that, over the 7-year life of the agreement, will total $240,000. Any of the claims that are, or become, subject to the agreement may be purchased outright by Andover during the option period for $5 million, subject to a sliding-scale NSR royalty. Andover has the option to lease other minerals lands owned by BBNC.

The principal properties making up the Bristol Bay properties are: the KUY property which is an epithermal gold–silver target located near the village of Kokhanok; the Fog Lake property, which is a copper–gold target located east of KUY and northeast of the Kamishak property; the Kemuk Property, which is a zoned mafic–ultramafic complex with platinum-group-element, iron, and titanium targets; the Chilikat Property, which is a copper–gold target comprising two claim blocks; and the Samuelsen Property, which is a copper–gold target. Andover plans to concentrate its near-term efforts on the KUY property. Twelve rock samples collected on the KUY property from a 6- to 12-inch-wide quartz vein cutting Tertiary volcanic rocks had grades ranging from 0.19 to 27.4 ounces of gold per ton. Two 1.5-mile-long induced-polarization (IP) geophysical lines were also completed on the property. One line draped the gold-bearing quartz vein and the second IP line was 1,000 feet to the south.

Gold Crest Mines Inc. acquired Niagara Development Corp. in 2006 and Niagara's interests in the Kisa and GL properties near Nyac and the northwestern bank of Kisaralik Lake and an unnamed lake just north of Gold Lake, respectively. The Kisa and GL claim groups were mapped and sampled at a reconnaissance scale. The 2006 program confirmed previous work and identified additional

areas of alteration and gold mineralization. Gold Crest contracted approximately 684 line-miles of aeromagnetic and electromagnetic surveys over portions of the project area in the late fall. Gold Crest also contracted an airborne LIDAR (laser altimetry) survey to produce extremely detailed topographic base maps for the Kisa and GL claim groups. Gold Crest staked additional mining claims and prospecting sites covering approximately 35 square miles in five claim groups: the Kisa, GL, Ako, Little Swift, and Gossan Valley.

Geology at the Kisa prospect consists of hornfelsed Kuskokwim Group sedimentary rocks intruded by silicified and locally argillically altered rhyolite to gabbroic dikes and sills. Strong silica–carbonate alteration has an elevated arsenic–bismuth–tungsten–molybdenum–antimony–gold geochemical signature. The primary drill target, the Kisa Breccia prospect, is an extensively silica–carbonate–sulfide-altered breccia body composed of a mixture of altered sedimentary and igneous clasts, many of which exhibit multiple generations of veining and brecciation. The breccia body is exposed over an area approximately 1,000 feet wide by 1,600 feet long and roughly 800 feet thick. Rock chip samples from breccia outcrops average better than 0.036 ounces of gold per ton, with select rock chip samples up to 0.20 ounces of gold per ton. At least three, but possibly five, separate igneous rock types are present in the breccia body.

The Golden Dike prospect on the Kisa claim group contains numerous silica–carbonate–sulfide-altered felsic rhyolite dikes and sills exposed over an area 1,000 by 10,000 feet with at least 620 feet of exposed vertical extent. Float mapping, aerial photographic linears, and airborne geophysical data suggest the dike swarm may extend in both directions under talus-covered slopes and into the adjacent valleys. Sedimentary rocks are heavily iron-oxide stained and fractured in the hornfelsed zones adjacent to and along the dike and sill margins. The dikes are often bleached, silicified, and typically contain disseminated to stockwork-vein-hosted sulfides. The large spatial extent and intense alteration associated with elevated gold values in nearly all samples collected from this dike swarm may indicate a major mineralized system at the surface and underlying the ridge.

The Pirate's Pick prospect in the Kisa claim group consists of a large northwest-trending quartz–carbonate–sulfide-veined fault zone with more than 500 feet of exposed vertical extent that may offset and displace a dike swarm. The average of 18 rock chip samples collected from this zone is 0.57 ounces of gold per ton.

The GL claim group covers a broad, bright red, iron-oxide-stained, northwest-trending ridge several miles long and nearly a mile wide adjacent to Gold Lake. The claim group contains the Gossan Ridge and Golden Alder prospects. The Gossan Ridge prospect consists of a banded quartz–sulfide vein system that runs along the crest and flanks of a heavily iron-oxide-stained ridgeline. The vein system and most intense alteration zone are exposed over a strike length of more than 1,600 feet with exposed widths up to 66 feet. Samples from the vein system consistently carry highly anomalous gold and pathfinder elements with select samples running up to 0.292 ounces of gold per ton and 5.83 ounces of silver per ton. The vein system appears to be associated with a series of porphyritic dikes that have produced pervasive and intense hydrothermal alteration of the host sedimentary rocks. The Golden Alder prospect consists of a linear fault zone exposed along the bottom and valley walls of a small drainage over a strike length of approximately 2,000 feet. Soils collected over covered areas on the valley walls and adjacent uplands suggest the zone may be as wide as 650 feet. A pronounced circular airborne geophysical anomaly underlies a portion of the fault system and its projection into an alluvium-covered area may represent a leakage halo emanating from a potentially mineralized intrusion at depth. The average of 18 rock chip samples collected from this structural zone average more than 0.044 ounces of gold per ton.

Full Metal Minerals entered into an agreement with Moore Creek Mining Ltd. to acquire a 100 percent interest in the Moore Creek gold property. Placer gold is coarse-grained and angular at Moore Creek and a monzonitic pluton is present in the headwaters of gold-bearing creeks. Minor placer gold exploration was conducted on properties across the region.

ALASKA PENINSULA REGION

Full Metal Minerals Ltd. and Metallica Resources Inc. continued exploration on Aleutian Islands and Alaska Peninsula properties controlled by Full Metal. Metallica completed two core holes at the Bee Creek prospect. Hole BC06-08 intersected 111.6 feet of 0.26 percent copper and 0.0025 ounces of gold per ton. Hole BC06-09 intersected 131.2 feet grading 0.51 percent copper and 0.006 ounces of gold per ton. Full Metal and Metallica also completed mapping, sampling, and ground geophysical surveys on the Kawisgag and Pyramid porphyry prospects (fig. 23).

SOUTHEASTERN REGION

Niblack Mining Corp. explored the copper–gold-rich Niblack volcanogenic massive-sulfide property on Prince of Wales Island. The exploration program included 27,000 feet of diamond drilling in 32 drill holes, environmental baseline studies, and construction of a 5,000-foot access road from tidewater to the future portal site (fig. 24). The portal site was cleared and readied to provide drilling access to potential deep mineralization below historic workings. The drill program focused on the Lookout zone, the most advanced area of the five known zones of massive-sulfide mineralization on the property. A new exploration model

Figure 23. *Quartz stockwork vein mineralization at the Pyramid prospect. Photo provided by Full Metal Minerals Ltd.*

includes multiple stacked massive-sulfide lenses with predictable geometries and plunge directions and showed excellent potential for expanding known zones, as well as discovering new sulfide lenses. The longest mineralized interval drilled to date was intersected in hole LO-159, which includes three distinct massive-sulfide lenses separated by stringer and disseminated sulfide mineralization grading 0.07 ounces of gold per ton, 1.37 ounces of silver per ton, 1.67 percent copper, and 4.05 percent zinc over 225.3 feet. Other significant mineralized drill intercepts include 27.2 feet grading 0.48 ounces of gold per ton, 4.41 ounces of silver per ton, 1.07 percent copper, and 16.26 percent zinc in hole LO-168; 16.3 feet grading 0.29 ounces of gold per ton, 4.06 ounces of silver per ton, 4.87 percent copper, and 15.42 percent zinc in hole LO-189; 88 feet grading 0.09 ounces of gold per ton and 0.41 ounces of silver per ton of near-surface oxide mineralization in hole LO-175; and 22.2 feet grading 0.57 ounces of gold per ton and 6.94 ounces of silver per ton of oxide mineralization in hole LO-176. A new massive-sulfide horizon was intersected at the Mammoth zone, with hole LO-174 intersecting 61.2 feet of semi-massive and massive sulfide grading 0.47 percent copper, including 14.2 feet grading 1.01 percent copper. Individual samples of massive sulfide contain up to 112.5 ppm gallium and 55.3 ppm indium and average 18 ppm selenium. Drilling has now extended mineralization 500 feet downdip of the main sulfide trend of the Lookout zone.

At the Greens Creek underground volcanogenic massive-sulfide mine near Juneau, Kennecott Minerals Co. continued drilling south and west of current workings and development drifting to explore the West Gallagher zone and additional reserves south of the 200 South, the West Bench, and the Deep Lower Southwest ore zones. The bulk of the underground exploration focused on the 5250 and West Gallagher zones, with an extension discovered to the silver-rich 5250 zone. Exploration has added approximately 6 million ounces of silver resources, along with significant zinc, lead, and gold resources, in the West Gallagher zone. Kennecott drilled almost 60,000 feet of core in underground exploration and more than 16,000 feet of core in surface exploration. Underground drifting for exploration totaled 683 feet.

Coeur Alaska Inc. continued gold exploration on its Kensington property near Juneau with an underground drilling program, while mine development continued. Coeur reported a 29 percent increase in gold reserves to 1.35 million ounces and a 24 percent increase in gold grade to 0.31 ounces of gold per ton as a result of exploration success at the Kensington and Jualin properties.

Full Metal optioned the Mount Andrew copper–gold project on Prince of Wales Island from the Mount Andrew Mining Co. Full Metal can earn a 100 percent interest in the project by expending $800,000 in exploration over 4 years, and paying $210,000 in cash over 4 years. Mount Andrew Mining will receive a 2 percent net smelter return royalty, which increases to 4 percent after the fifth year of production. Full Metal completed a 1,580-foot core drilling program to test an iron-oxide copper–gold mineralization model around the edges of old underground and surface workings. Four of five holes encountered multiple inter-

Figure 24. *Construction of an access road from tidewater to a future portal site at the Niblack property. Photo courtesy of Niblack Mining Corp.*

sections of magnetite–chalcopyrite mineralization. The best intercept was in hole KMA06-01, with 98 feet of mineralization starting at a 5-foot depth and grading 0.87 percent copper, 0.0035 ounces of gold per ton, and 0.10 ounces of silver per ton. Other intercepts included 160 feet grading 0.72 percent copper and 0.085 ounces of silver per ton in hole 3; 99 feet of 0.55 percent copper and 0.70 ounces of silver per ton, and 71.5 feet of 0.82 percent copper and 0.087 ounces of silver per ton in hole 4; and 64.3 feet grading 0.58 percent copper, 0.005 ounces of gold per ton, and 0.067 ounces of silver per ton in hole 5.

Bravo Venture Group Inc. conducted reconnaissance surface exploration of the "Blue Quartz" auriferous veins in the southwestern portion of Woewodski Island. Hand trenching was completed at the Miami Beach, Hattie, and Krause's showings. Previous rock samples from these showings had contained up to 15.87 ounces of gold per ton with low silver and pathfinder element values. Soil sampling occurred at the Miami Beach and Matt's vein showings, and prospecting was completed on a dozen other quartz-veined areas. Mechanical trenching was scheduled for the Matt's vein showing. Samples from the new Red Quartz showing traced the vein system for 1,000 feet along strike and contained up to 0.11 ounces of gold per ton and 2.67 ounces of silver per ton, with elevated arsenic and antimony values.

Constantine Metal Resources Ltd. acquired the Palmer massive-sulfide property from Toquima Mineral Corp. and drilled 2,720 feet of core in three holes at the RW zone. Hole CMR06-01 intersected 16.8 feet of massive sulfide grading 10.86 percent zinc, 0.13 percent lead, 0.23 percent copper, 0.004 ounces of gold per ton and 1.30 ounces of silver per ton. Hole CMR06-02 intersected a 2.59-foot-wide massive-sulfide lens grading 19.5 percent zinc. Several placer gold operations conducted trenching and bulk sampling.

DEVELOPMENT

Reported and estimated mineral development expenditures in 2006 were approximately $495.7 million, a 42.5 percent increase over the 2005 value of $347.9 million. The increase is due to continued construction at the Pogo project, the Kensington project, and the Nixon Fork project, and to initiation of construction at NovaGold's Rock Creek/Big Hurrah project. Other significant investments took place at Fort Knox, Red Dog, and Greens Creek mines. Employment attributed to development is estimated to be 848 jobs for 2006 compared to 498 jobs for 2005.

Table 6 shows development investment and regional employment. Table 7 compares the 2006 investment with that of the previous 24 years by commodity. Figure 25 shows the locations of selected development projects. Development activity was reported in all but the Alaska Peninsula region.

Table 6. *Reported mineral development expenditures and employment in Alaska by commodity and region, 2006*

	Northern	Western	Eastern Interior	South-central	South-western	Alaska Peninsula	South-eastern	Total
Development Expenditures								
Base metals	$31,200,000	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	**$ 31,200,000**
Polymetallic	0	0	0	0	0	0	26,183,280	**26,183,280**
Precious metals								
Placer	1,769,000	126,000	478,300	145,250	30,000	0	200,000	**2,748,550**
Lode	0	55,499,832	240,590,821	320,000	0	0	121,600,000	**418,010,653**
Coal and peat	0	0	7,985,000	8,000,000	0	0	0	**15,985,000**
Industrial minerals	0	100,000	800,000	516,000	0	0	150,000	**1,566,000**
TOTAL	**$32,969,000**	**$55,725,832**	**$249,854,121**	**$8,981,250**	**$30,000**	**$ 0**	**$148,133,280**	**$495,693,483**
Development Employment								
Employment								
Workdays	2,110	32,790	47,660	10,820	50	0	127,100	220,530
Workyears[a]	8	126	183	42	0	0	489	848
No. of companies reporting[b]	3	5	12	7	1	0	5	33

[a]Based on 260-day workyear.
[b]Some companies are active in more than one area/commodity.
0 = No expenditures reported.

Table 7. *Reported mineral development expenditures in Alaska by commodity, 1982–2006*

	Base metals	Polymetallics	Precious metals	Industrial minerals	Coal and peat	Total
1982	$ 10,270,000	N/A	$ 19,320,000	$ 4,251,000	$ 7,750,000	**$ 41,591,000**
1983	19,500,000	N/A	7,112,500	1,000,000	250,000	**27,862,500**
1984	10,710,500	N/A	15,058,555	579,000	27,000,000	**53,348,055**
1985	13,000,000	N/A	16,890,755	1,830,000	2,400,000	**34,120,755**
1986	3,260,800	8,000,000	12,417,172	124,000	530,000	**24,331,972**
1987	38,080,000	48,000,000	13,640,848	188,000	342,000	**100,250,848**
1988	165,500,000	69,000,000	40,445,400	--	--	**274,945,400**
1989	118,200,000	411,000	6,465,350	7,000,000	2,196,000	**134,272,350**
1990	--	4,101,000	7,136,500	30,000	3,079,000	**14,346,500**
1991	--	8,000,000	14,994,350	262,000	2,318,000	**25,574,350**
1992	80,000	4,300,000	23,151,300	404,000	1,655,000	**29,590,300**
1993	--	10,731,136	15,103,000	433,500	1,400,000	**27,667,636**
1994	10,000,000	5,000,000	27,392,850	5,000	2,545,000	**44,942,850**
1995	11,200,000	9,590,000	127,165,750	426,000	200,000	**148,581,750**
1996	60,000,000	60,100,000	273,042,000	495,000	400,000	**394,037,000**
1997	133,880,000	7,300,000	26,299,000	500,000	410,000	**168,389,000**
1998	28,000,000	5,600,000	15,602,000	5,355,000	850,000	**55,407,000**
1999	12,500,000	2,500,000	15,864,000	400,000	2,575,000	**33,839,000**
2000	100,000,000	16,400,000	24,699,000	611,000	--	**141,710,000**
2001	43,800,000	3,300,000	32,719,000	300,000	1,040,000	**81,159,000**
2002	--	5,700,000	26,655,000	250,000	1,450,000	**34,055,000**
2003	--	--	38,839,332	315,000	--	**39,154,332**
2004	17,700,000	6,215,000	177,440,081	4,991,434	2,760,000	**209,106,515**
2005	28,000,000	16,700,000	301,011,469	856,500	1,350,000	**347,917,969**
2006	31,200,000	26,183,280	420,759,203	1,566,000	15,985,000	**495,693,483**
TOTAL	**$854,881,300**	**$317,131,416**	**$1,699,224,415**	**$32,172,434**	**$78,485,000**	**$2,981,894,565**

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

NORTHERN REGION

Total expenditures in the region amounted to $33.0 million with Teck Cominco spending a significant proportion of the total. Silverado Gold Mines Ltd. resumed underground placer mine development at the Nolan Creek project to account for most of the balance of the expenditures.

Teck Cominco undertook capitalized maintenance efforts and natural gas development efforts at the Red Dog mine in northwestern Alaska costing approximately $31.2 million. Development of a natural gas resource is intended to replace electrical power generation by diesel-driven internal combustion engines. Natural gas creates far less emissions and a nearby energy source would provide considerable economic returns to the operation. Promising results are being returned by the gas development program that will be further advanced during 2007. Teck Cominco's 100-percent-owned Red Dog Mine is located in northwestern Alaska and is the largest zinc-producing mine in the world. Red Dog's proven and probable reserves at the end of the 2006 were 75,729,000 tons containing 17.5 percent zinc and 4.6 percent lead.

Silverado Gold Mines Ltd. continued underground development efforts at the Nolan Creek property during the first few cold months and the latter part of the year. The property is located approximately 6 miles northwest of Wiseman, Alaska, along the south flank of the Brooks Range. Effort was directed at development of the Swede Channel, an elevated deeply buried channel on the east side of Nolan Creek. Approximately 900 feet of the channel was developed to produce approximately 2,900 bank cubic yards (bcy) of gold-bearing gravel. An additional 3,200 bcy of gravel was mined from other undefined portions of the Swede Channel, bringing the total stockpile to 6,100 bcy. Wash plant operation to treat the 2005–06 winter production yielded 939 ounces. The recoverable grade was 0.154 ounces per bcy. Ore resource estimates based on drilling and conventional polygonal methods of determination indicated 5,000 bcy of resource with a grade of 0.275 oz/bcy in the channel. The Mary's East area is also defined and is being readied for production.

I Northern Region

1. Red Dog Mine—Teck Cominco Alaska Inc. (mill, tailings dam)
2. Nolan Creek Mine—Silverado Gold Mines Ltd. (underground)

II Western Region

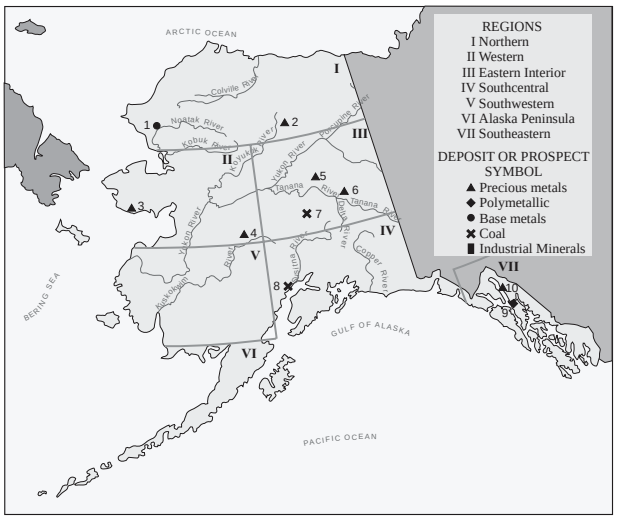
3. Nome area
   a. Rock Creek Project—NovaGold Resources Inc. (permitting, drilling)
   b. Several open-pit and placer gold mines
4. Nixon Fork Mine—St. Andrew Goldfields Ltd. (mill upgrade, site construction)

III Eastern Interior Region

5. Fairbanks area
   a. Fort Knox Mine—Kinross Gold Corp. (stripping)
   b. Several open-pit and underground placer gold mines
   c. Several rock, sand, and gravel operations (equipment)
6. Pogo Project—Teck Cominco Alaska Inc./Sumitomo Metals Mining America Inc. (road, power line, underground, and site construction)
7. Usibelli Coal Mine—Usibelli Coal Mine Inc. (equipment)

IV Southcentral Region

8. Chuitna Coal Project— PacRim Coal LP (studies, permitting)



V Southwestern Region

VI Alaska Peninsula Region

VII Southeastern Region

9. Greens Creek Mine—Kennecott Minerals Co./Hecla Mining Co. (access drifting, tailings storage)
10. Kensington Project—Coeur Alaska Inc. (permitting, resource definition)

Figure 25. *Selected mineral development projects in Alaska, 2006.*

WESTERN REGION

Development expenditures were reported for lode, placer, and sand and gravel projects. Five projects reported expenditures amounting to $55.7 million for the year.

NovaGold Resources' (Alaska Gold) Rock Creek gold project on the Seward Peninsula received permits and commenced construction in August 2006 (figs. 26 and 27. Highlights for 2006 included completion of detailed engineering, receipt of permits and board approval for construction, initiation of construction on August 22, 2006, completion of an NI 43-101-compliant resource update for Rock Creek, Big Hurrah, and Nome Gold projects, and initiation of a preliminary economic assessment for Nome Gold, with targeted completion for the first half of 2007. The estimated 9-month construction schedule proceeded smoothly until mid-November, when a small group of Nome residents challenged the U.S. Army Corps of Engineers' issuance of a wetlands permit for the project. Neither NovaGold nor its subsidiary, Alaska Gold Co., was named in the suit, but the permit was suspended to allow the Corps to review the permitting process. Work continued through the winter in previously disturbed areas and delays to the project were minimal. The Corps reached a "finding of no significant impact" (FONSI) in an environmental assessment for the project, and reinstated the permit effective March 13, 2007.

NovaGold budgeted $33 million for completion of construction during 2007. The mill is designed to treat 7,700 tons per day. Total operating employment is estimated at 135 workers. The operating plan calls for Big Hurrah and Rock Creek to be mined concurrently, but at different rates, to provide a blended mill feed. The higher grade, but lower volume of the Big Hurrah will increase the mill head grade for a better return on investment. NovaGold envisions the development of the Rock Creek deposit as part of an integrated operation that includes Rock Creek, Saddle and Big Hurrah deposits, and the Nome Gold alluvial deposit, which collectively contain in excess of 3 million ounces of gold resource. Gold resources for the respective properties are shown in table 8.

St. Andrew Goldfields Ltd. continued underground efforts and started a mill upgrade at the historic high-grade Nixon Fork gold–copper mine in west-central Alaska. Mill and facility upgrading began in May 2006 and continued through the year to near completion. Underground access and stope construction were undertaken and some ore was

Table 8. *NovaGold's gold resources at Rock Creek, Big Hurrah lode deposits, and various placer holdings at Nome*

		Resources		
Project	**Category**	**Tons**	**Bank Cubic Yards**	**Ounces**
Rock Creek	Indicated	10,600,000	- -	404,000
	Inferred	1,540,000	- -	44,000
Saddle	Historical	3,970,000	- -	260,000
Big Hurrah	Indicated	1,980,000	- -	273,000
	Inferred	660,000	- -	56,000
Nome Gold	Measured	- -	103,400,000	800,000
	Indicated	- -	109,600,000	760,000
	Inferred	- -	33,700,000	250,000
TOTAL		**18,750,000**	**246,700,000**	**2,847,000**

- - = Not reported.

stockpiled awaiting commissioning of the mill. The mill was upgraded to handle a throughput of 265 tons per day from its previous capacity of 150 tons per day. The crushing circuit was relocated and upgraded to include a new cone crusher, new conveyor belts, a new baghouse, and dust collection. Mill electrics were upgraded and the gravity circuit was upgraded to include Falcon Concentrators and new cleaner tables. The grinding circuit was upgraded to include a rod mill and an overhead bridge crane. The power plant was upgraded and included three 3508 Cat generators (830 kW each). Mining equipment including an MTI Vein-Runner jumbo and J & J Machine Works Long Tom for drilling and blasting, Atlas Copco 2-yard muckers and Atlas Copco MT413 haul trucks for mucking and haulage, jacklegs, split sets, mats, and wire for ground support.

A tailings carbon-in-leach circuit is to be installed in 2007 and will include a 350-ton-per-day Larox filter press for tailings dewatering and dry-stack tailings storage. The operation will provide 97 full-time jobs and is expected to produce 40,000 ounces of gold per year beginning in 2007. Operating costs are forecast to be $350 per ounce. Mine life is expected to be 4 years.

Reserves and resources for the project are shown in table 9. Existing tailings amounting to 63,900 tons with a gold grade of 0.236 ounces per ton are included in the indicated and inferred resource.

Other development and capitalized efforts amounting to $226,000 on three projects were reported by placer gold and sand and gravel operators.

Figure 26. *Construction of the mill site infrastructure at the Rock Creek gold property. Photo by NovaGold Resources Inc.*

Figure 27. *Construction of the mill at the Rock Creek gold project. Photo courtesy of NovaGold Resources Inc.*

Table 9. *Gold reserves and resources at Nixon Fork Mine as of December 31, 2006*

Class	**Category**	**Tons**	**Grade, ounce/ton**	**Ounces**
Reserve	Proven	51,800	0.994	51,500
	Probable	151,600	0.543	82,230
Resource	Measured	25,800	1.074	27,700
	Indicated	138,900	0.631	87,700
	Inferred	102,500	0.452	46,300

EASTERN INTERIOR REGION

Total construction expenditures allocated to the Eastern Interior region amounted to $249.9 million. This compares to $251.4 million for 2005. Construction at Pogo was the dominant project for the region. Other projects or sector expenditures included Fort Knox's advanced stripping and fairly significant efforts to develop placer and sand and gravel projects.

The Pogo Mine, located 90 miles southeast of Fairbanks and operated by Teck Pogo Inc., poured its first gold in mid-February and was commissioned during the year, officially on June 5, but capitalized expenditures continued and will extend well into 2007 to bring the operation up to intended mining and treatment rates (fig. 28). Teck Pogo is the project operator and a subsidiary of Teck Cominco, which owns a 40 percent interest in the Pogo deposit. Co-owners are Sumitomo Metal Mining Co., which owns a 51 percent interest and Sumitomo Corp., holding a 9 percent interest in the mine. Construction of the Pogo mine was completed in the first quarter except for the installation of the underground ore conveyor system, which was fully commissioned in the second quarter. Inadequate tailings filtration capacity became apparent early in the mill commissioning process, thereby restricting mill throughput to 50–60 percent of design capacity. A major electrical power outage was experienced on October 19 when a contractor dug into a buried power cable. Temporary power was installed, allowing maintenance activities and construction projects to resume on October 22, and underground mining on October 28. Mill operations resumed on December 14, after line power was restored. Despite the electrical incident, the Pogo gold mine continued to make progress towards achieving full production capacity. A third pressure filter to improve filtration capacity was commissioned in January 2007. Construction is underway on modifications to the filtered tailings handling system to help paste backfilling and is scheduled to be completed by March 2007. Capitalized expenditures were $190.7 million. Construction-equivalent jobs allocated to the project were 180 workers for the year.

Figure 28. *Drilling underground at the Pogo Mine with a jumbo drill. Photo provided by Teck Cominco Ltd.*

Fairbanks Gold Mining Inc., a wholly owned subsidiary of Kinross Gold Corp., continued advanced stripping of waste during 2006 and undertook studies and permitting to utilize valley heap leaching to treat low-grade ores. Capital expenditures for 2006 were approximately $49.9 million and were mainly attributed to the Phase 6 capital development at the Fort Knox pit. In addition, the company continued investigation and permitting of valley-type heap leach for its lower grade materials. Knight Piesold and Co. was the consulting firm for this project. The heap is designed to contain 160 million tons of low-grade ore. The proposed pad will cover 279 acres in the Walter Creek drainage above the tailings pond. Ore for the heap will consist of run-of-mine rock from the Fort Knox pit and various stockpiles. Twenty-nine million tons of ore are currently stockpiled in the Barnes Creek and Fish Creek stockpiles. The ore is characterized by relatively high permeability, which will promote solution flow and drainage for rapid rinsing at closure. In-heap storage of process solution and storm water will be accomplished by constructing an embankment in the downstream toe of the heap.

Usibelli Coal Mine Inc. undertook capitalized maintenance and acquisition efforts during 2006 to improve operational effectiveness. The dragline tub was rebuilt during August and September. A Caterpillar 777 100-ton-capacity truck was ordered for the longer haul from the Jumbo Dome Mine, to be commissioned in about 5 years.

Silverado Gold Mines Ltd. completed reclamation work on the Ester Dome property. The work consisted of backfilling open cuts that were excavated during operations conducted to supply gold-bearing rock to their Grant Mill Facility. The Ethel and Elmes pits were backfilled with an estimated 200,000 cubic yards of stockpiled waste rock, and then covered with a layer of stockpiled organic material to facilitate re-vegetation. In addition, all remaining exploration trenches were backfilled, stabilized, and seeded to resist surface erosion. Annual assessment work was completed and all claim rental payments were made to maintain the property in good standing. The sum of $9,400.00 was paid to the Fairbanks North Star Borough in taxes on the mill facility and mine facilities. The Grant Mine tailings pond is planned to be reclaimed in 2007.

Ten additional placer gold and sand and gravel projects reported capitalized expenditures totaling $1.28 million for the year.

SOUTHCENTRAL REGION

Development expenditures totaling $8.98 million were reported for seven projects in 2006; this compares

to expenditures of $2.2 million in 2005 from nine projects. Sector reports were received from placer and lode gold, gemstone, sand and gravel, and coal projects.

PacRim Coal LP continued engineering and permitting for the Chuitna coal project on the north shore of Cook Inlet approximately 50 miles west of Anchorage. PacRim is a Delaware-based limited partnership; the managing partner is PacRim Coal-GP, LLC. During 2006 PacRim continued baseline environmental and engineering studies. The final supplemental EIS is scheduled to be published in 2007. Reserves in-place amount to 655 million tons, 300 million of which are recoverable. The stripping ratio averages 5.2 bank cubic yards per ton of coal. The project is designed to include a coal export terminal with 3 to 12 million ton capacity and a 12-mile-long covered conveyor from mine facilities. Construction costs are anticipated to be $650 million, with construction forecast to begin in 2007 and production beginning in 2009.

Agrium U.S. Inc. and Usibelli Coal Mine continued engineering and permitting for the "Kenai Blue Sky Project." The project is to develop a world-class, low-emission coal gasification facility that would create a long-term off-take gas opportunity for Agrium's Kenai nitrogen facility and that would generate competitively priced electricity for the regional power grid. It would also provide excess carbon dioxide that could be used for enhanced oil recovery. A preliminary review of the project has been completed and the detailed feasibility review will include further development of industry partnerships, more detailed definition of the design, and commencement of environmental permitting. The U.S. Department of Energy found that a coal-gasification system is technically and economically feasible. The facility would use 3.3 million tons of coal per year. Coal would be railed to Anchorage or Port Mackenzie and barged down Cook Inlet to Nikiski. Target start-up date is 2011. Agrium has been awarded a $2 million grant from the Denali Commission and a $5 million grant from the State of Alaska for the preliminary engineering and permitting phase of the project, anticipated to cost $22 million. The Phase 1 feasibility study cost $3 million.

Chinese Petroleum Corp., Taiwan's state-owned petroleum company, signed an agreement with the Alaska Industrial Development and Export Authority (AIDEA) and Alaska Natural Resources-to-Liquids LLC (ANRTL) to fund a $1.5 million preliminary feasibility study for an 80,000-barrel-per-day coal-to-liquids fuels plant near the Beluga coal fields on the west side of Cook Inlet. AIDEA's board approved $500,000 participation. ANRTL could act as developer and the company is in discussions with Sasol, a South African energy company, and Shell Oil regarding participation by one or both companies in the Beluga plant. Sasol has extensive experience with large plants making liquid products from coal using the Fischer-Tropsch process. Shell operates a Fischer-Tropsch plant in Malaysia that manufactures an ultra-clean diesel and petrochemical feedstock from natural gas for markets in Asia and the United States. Both companies are also engaged in building new Fischer-Tropsch plants in Qatar, based on gas, and both have projects in development in China to make liquid products from coal.

As envisioned, the coal-to-liquids project would require approximately 17 million tons of coal a year for 40 years. The plant would make up to 80,000 barrels per day of ultra-clean fuels for the U.S. West Coast market. If built, the plant would be a major project with capital costs of $5 billion or more. Seventy-five percent of the Alaska project's output would be an ultra-clean diesel fuel, 20 percent would be naphtha and 5 percent would be LPGs, or liquefied petroleum gases. The plant could also boost Cook Inlet oil recovery by making large volumes of low-cost carbon dioxide available for enhanced oil recovery in aging oil fields in the inlet. Estimates are that a large coal-to-liquids plant near the Beluga coal fields would also have waste heat sufficient to generate 300 megawatts of electricity. Generation of electricity with waste heat would reduce the need for natural gas now burned in the boilers of local power plants.

Placer gold and gemstone projects reported advance stripping and facility improvements amounting to $465,300.

Sand and gravel projects reported facility improvements and advance stripping amounting to $516,000.

ALASKA PENINSULA REGION

No development expenditures were reported in this region for 2006.

SOUTHEASTERN REGION

Total development expenditures reported for the region for 2006 amounted to $148.13 million, the second highest expenditure region in the state and nearly triple the previous year's amount. Expenditures in 2005 totaled $54.75 million. Five projects reported activity including Kensington and Greens Creek mines, Calder limestone quarry, and two placer gold projects.

Construction at Coeur Alaska Inc.'s Kensington underground gold mine complex in southeastern Alaska, 45 miles north of Juneau, continued through 2006 although work on the tailings facility remained suspended. Efforts included construction of the mill and supporting surface facilities as well as underground development (figs. 29 and 30). Expenditures in 2006 totaled $121.6 million. Employment, including contractors, numbered 385 persons during the year. At year's end, Coeur had 91 full-time employees on its payroll. The company currently estimates the actual cost of construction to be approximately $238 million compared with the previous estimate of $190 million. Coeur plans to spend $77.7 million on the project during 2007.

Figure 29. *Mill site development at the Kensington gold property. Photo courtesy of Coeur Alaska Inc.*

Figure 30. *Trim and sheeting being installed on mill and crusher buildings at the Kensington gold property. Photo provided by Coeur Alaska Inc.*

Ore definition efforts during 2006 expanded Kensington's reserves to 4,419,000 tons with a grade of 0.31 ounces of gold per ton, containing 1,352,140 ounces of gold. Metallurgical recovery is expected to be 95.3 percent. Coeur plans a production rate of 100,000 ounces per year at a cash cost of $310 per ounce. The milling process will involve treating approximately 1,100 tons of ore per day and will involve primary crushing, SAG mill grinding, gravity, and flotation concentration with about 40 percent of the tailings returned to the mine for backfill; the remaining tailings will be hauled to the Lower Slate Lake tailings storage facility. Concentrates will be packaged and shipped off site for final gold recovery. The mine will provide about 225 direct and approximately 500 indirect jobs. Commercial production could begin in late 2007, subject to successful resolution of the permitting and litigation issues described below.

Construction was started in mid 2005 upon receipt of all permits, but on September 12, 2005, lawsuits were filed by private entities against the U.S. Army Corps of Engineers and the U.S. Forest Service, resulting in suspension on November 22, 2005, of construction of facilities to dispose of tailings in Lower Slate Lake. On March 29, 2006, the Corps reinstated Coeur's Section 404 permit; however, on April 6, the lawsuit challenging the permit was reopened. On August 4, 2006, the Federal District Court in Alaska dismissed the plaintiffs' challenge and upheld the permit. On August 7, 2006, the plaintiffs filed a Notice of Appeal of the decision to the U.S. Ninth Circuit Court of Appeals and on August 9, the plaintiffs additionally filed a Motion for Injunction Pending Appeal with the Circuit Court. The Circuit Court granted a temporary injunction pending appeal on August 24, enjoining certain activities relating to the lake tailings facility. The Circuit Court further ordered an expedited briefing schedule on the merits of the legal challenge. The parties filed their briefs by October 13, 2006, and participated in an oral argument on December 4, 2006. The Ninth Circuit Court of Appeals announced a ruling on March 16, 2007, that reversed the lower federal court decision and vacated the permits associated with the tailing facility. Coeur is awaiting the full explanation of this ruling and considering all appeal options.

Kennecott Greens Creek Mining Co. undertook underground development and surface facility improvement at the Greens Creek Mine on Admiralty Island, approximately 20 miles west of Juneau. Greens Creek is owned by Kennecott Minerals Co. (70.27 percent) and Hecla Mining Co. (29.73 percent). Development activity was directed toward driving 8,636 feet of primary and 1,435 feet of secondary access for the underground operations. Headings are 15 feet high by 15 feet wide. In addition, expenditures were made to install infrastructure to augment the mine's diesel-generated power with less expensive hydroelectric power in the future, and an ongoing project undertaken to expand the tailings facility to be completed in 2 years. Contractors involved in this effort included Connors Drilling LLC, Thyssen Mining, M3-Engineering & Technology Corp., North Pacific Erectors Inc., Channel Construction Inc., and Larry Iverson Construction Inc.

Reserves at Greens Creek as of the end of 2006 were 7,677,000 tons at grades of 0.11 ounces of gold per ton, 14.4 ounces of silver per ton, 4.0 percent lead, and 10.4 percent zinc. Additionally, resources amounting to 2,414,000 tons with grades of 0.13 ounces of gold per ton, 13.8 ounces of silver per ton, 4.0 percent lead, and 10.4 percent zinc have been delineated at the mine. Of the 295 total employees at Greens Creek, 50 were assigned to the development efforts.

Select Resources Corp. Inc., a subsidiary of Tri-Valley Corp., undertook limited development at the Calder calcium carbonate deposit, located on the northwest side of Prince of Wales Island. The deposit consists of 13.9 million tons of drill-proven and probable reserves and 12.5 million tons of possible resources of high-chemical-grade,

high-brightness, and high-whiteness calcium carbonate. Potential uses of this product include paper, plastics, paint filler, whitener, extender, and loader markets. An additional 20 million tons of possible resources of slightly lower quality calcium carbonate may have use in chemical applications and as off-white fillers, loaders, and extenders. According to Select Resources, the mine is considered to be in the top 1 percent of high-grade calcium carbonate deposits in the world. The current mine covers only 15 acres; the entire property covers 572 acres of patented mining ground, and includes all operating permits and tideland leases. Less than 10 percent of the gross acreage has been explored and Select Resources believes additional resources may yet be discovered.

Two placer projects reported development efforts in preparation for commissioning production.

PRODUCTION

Production values amounting to $2,858.2 million were reported for 2006, a substantial increase over 2005 of $1,401.6 million. The increase is due primarily to improved metal prices, which are up significantly compared to 2005. Production volumes were up for all metal commodities except zinc and were down for all non-metal commodities except peat. Metal price percentage improvements from 2005 were: gold, 35.69 percent; silver, 57.80 percent; lead, 35.87 percent; and zinc, 134.95 percent. Metals (gold, silver, lead, and zinc) account for $2,721.1 million, coal and peat for $50.0 million, and industrial minerals for $87.2 million. Metal production quantity variances included: gold, up 143,097 ounces; silver, up 4,819,394 ounces; lead, up 25,761 tons; and zinc, down 10,495 tons. The silver production increase mainly reflects a return to the previous reporting method of silver from Red Dog. The rock, sand, and gravel industry's production value was down from 2005; part of this is due to reporting shortfalls, although reduced production is noted.

Table 10 shows the quantity and value of metal and materials production from 2004 to 2006. Table 11 lists the miners and mines that reported producing metal in 2006. Figures 31, 32, and 33 show the historic production of sand and gravel, gold, and coal. Selected production sites are shown in figure 34.

Table 10. *Estimated mineral production in Alaska, 2004–2006*[a]

	Quantity			Estimated Values[b]		
Metals	**2004**	**2005**	**2006**	**2004**	**2005**	**2006**
Gold (ounces)[c]	456,508	427,031	570,129	$192,343,315	$189,918,000	$344,049,779
Silver (ounces)	16,947,270	11,670,000	16,489,394	113,056,930	85,382,000	190,415,907
Copper (tons)[d]	0	0	0	0	0	0
Lead (tons)	150,796	131,366	157,128	120,636,822	115,230,000	183,629,254
Zinc (tons)	680,015	684,462	673,967	651,432,200	862,108,000	2,002,971,414
Subtotal				**$1,077,469,267**	**$1,252,638,000**	**$2,721,066,354**
Industrial Minerals						
Jade and soapstone (tons)[e]	0	0	0	0	0	0
Sand and gravel (million tons)	19.6	16.6	9.3	101,507,347	76,537,000	63,351,089
Rock (million tons)	7.3	2.8	2.4	106,207,814	22,547,000	23,846,024
Subtotal				**$207,715,161**	**$99,084,000**	**$87,197,113**
Coal (tons)	1,450,000	1,402,174	1,397,500	50,750,000	49,076,000	48,912,500
Peat (cubic yards)	208,032	62,532	66,500	2,732,554	810,000	1,057,500
Subtotal				**$53,482,554**	**$49,886,000**	**$49,970,000**
TOTAL				**$1,338,666,982**	**$1,401,608,000**	**$2,858,233,467**

[a]Production data from DGGS questionnaire, phone interviews with mine and quarry operators, ADOT&PF, and municipalities, Regional corporations, and federal land management agencies.
[b]Values for selected metal production was based on average prices for each year; (unless other values were provided by the operator); for 2006—gold $603.46/ounce, silver $11.55/ounce, lead $0.58/lb, zinc $1.47/lb.
[c]2006 lode production 509,747 ounces; placer production 60,382 ounces.
[d]Greens Creek has historically been credited with a small copper concentrate production; no credit was experienced for 2004–2006 production.
[e]Jade and soapstone credit has been dropped .

Table 11. *Companies and individuals reported to be producing metal in Alaska, 2006*

Operator	Creek	District	Type[a]
	NORTHERN REGION		
Barry Lambeth	Jennie Creek	Koyukuk	S/D, Recreation
Bill Feses	Boulder Creek	Koyukuk	O/P Placer
Brian Yoder	Sheep Creek	Koyukuk	O/P Placer
Chester Bell	Emery Creek	Koyukuk	S/D, Recreation
Compass Mining Inc.	Linda Creek	Koyukuk	O/P Placer
Donald Korte	Clara Creek	Koyukuk	S/D, Recreation
Eric Pyne	Jim Pup, Wakeup Creek, California Creek, Lake Creek	Koyukuk	O/P Placer
Glen DeFord	Smally Creek	Koyukuk	S/D - Large
Hans Sobanja	Gold Creek	Koyukuk	O/P Placer
James Wicken	Gold Creek	Koyukuk	O/P Placer
Jay Armstrong	Hammond River	Koyukuk	S/D - Large
Jim Olmstead	Gold Creek	Koyukuk	O/P Placer
Joe Coop	South Fork Koyukuk River	Koyukuk	S/D, Recreation
Larry Weisz	Hammond River	Koyukuk	O/P Placer
Lloyd Swenson	Slate Creek	Koyukuk	O/P Placer
Michael Greene	Davis Creek, South Fork Koyukuk River	Koyukuk	S/D - Large
O.J. Jiles	Bold Bottom Creek	Koyukuk	O/P Placer
Paradise Valley Inc.	Birch Creek	Koyukuk	S/D, Recreation
Raimunds' Mining & Trading Inc.	Minnie Creek	Koyukuk	O/P Placer
Richard Wright	Magnet Creek, Gold Creek	Koyukuk	O/P Placer
Sadie Mac Mining	Slate Creek	Koyukuk	O/P Placer
Slisco Inc.	Buckeye Creek	Koyukuk	O/P Placer
Slisco Inc.	Hammond River	Koyukuk	O/P Placer
Slisco Inc.	Hammond River	Koyukuk	O/P Placer
Slisco Inc.	Marion Creek	Koyukuk	O/P Placer
Slisco Inc.	Nugget Creek	Koyukuk	O/P Placer
Stewart Brandon	Myrtle Creek	Koyukuk	O/P Placer
Teck Cominco Alaska Inc.	Red Dog Mine	Noatak	O/P HR
Tricon Mining Inc.	Nolan Creek	Koyukuk	O/P Placer
William Nordeen	Emma Creek	Koyukuk	O/P Placer
	WESTERN REGION		
Alamin Mining Company	Cripple Creek, Bear Creeks	Innoko	O/P Placer
Andrew Lee	Norton Sound	Cape Nome	S/D - Large
Arctic Gold Company, LLC	Offshore	Cape Nome	S/D - Large
Barry Clay	Willow Lake, Swift Creek	Ruby	O/P Placer
Bruce Weichelt	Norton Sound	Cape Nome	S/D - Large
Chris Jenks	Anvil Creek	Cape Nome	O/P Placer
Chuck Titus	Norton Sound	Cape Nome	S/D, Recreation
Clifton McHenry	Norton Sound	Cape Nome	S/D - Large
Craig Coggins	Norton Sound	Cape Nome	S/D - Large
Daniel Plano	Anvil Creek, Innoko River	Innoko	O/P Placer
Donald Mullikin	Noxapaga River, Boulder Creek	Kougarok	O/P Placer
Douglas Martinson	Dry Creek, Newton Creek	Cape Nome	O/P Placer
Douglas Martinson	Mackum Creek	Kougarok	O/P Placer
Frank McFarland	Norton Sound	Cape Nome	S/D - Large
Goldstride Mining Corporation	Martin Creek	Cape Nome	O/P Placer
Hansen Gold	Shovel Creek	Cape Nome	O/P Placer
Innoko Resources Group	Innoko River	Innoko	O/P Placer
Jan Kralik	Gold Run Creek	Point Clarence	S/D, Recreation
Jan Kralik	Norton Sound	Cape Nome	S/D, Recreation

[a]O/P = Open-pit; H/R = Hard-rock; U/G = Underground; S/D = Suction Dredge; Large - Greater than equal to 8" nozzle.
S/D, Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Table 11. *Companies and individuals reported to be producing metal in Alaska, 2006—continued*

Operator	Creek	District	Type[a]
Jerry Landgreba	Norton Sound	Cape Nome	S/D - Large
Jerry Pushcar	Benson Creek	Kougarok	O/P Placer
John Mehelich	Norton Sound	Cape Nome	S/D - Large
Jon Peckenpaugh	Sherrette Creek	Kougarok	O/P Placer
K & S Leasing	Norton Sound	Cape Nome	S/D - Large
Kenneth Kerr	North Fork Fortymile River	Fortymile	S/D, Recreation
Kiwalik Mining Ltd.	Gold Run Creek	Fairhaven	O/P Placer
Mark Gumaer	Dick Creek	Kougarok	O/P Placer
Maureen Pederson	Niukluk River	Council	O/P Placer
Mike McClurg	Ophir Creek, Gold Run Creek	Innoko	O/P Placer
Mystery Creek Resources Ltd.	Nixon Fork Mine	McGrath	U/G HR
N.B. Tweet & Sons	Kougarok River	Kougarok	O/P Placer
Neil Beaton, Jr	Golden Creek	Melozitna	O/P Placer
Neil Rosander	Cripple Creek	Innoko	O/P Placer
Paul Sayer	Ester Creek	Innoko	O/P Placer
Perry Massie	Arctic Creek	Cape Nome	S/D, Recreation
Ralph Anderson	Dry Creek	Cape Nome	O/P Placer
Randall Smith	Norton Sound	Cape Nome	S/D - Large
Richard Redmond	Little Macklin Creek, Macklin Creek	Kougarok	O/P Placer
Robin Gumaer	Doree Creek	Cape Nome	O/P Placer
Roger Nordlum	Glacier Creek	Fairhaven	O/P Placer
Rosander Mining Co., Inc.	Colorado Creek	Innoko	O/P Placer
Samuel Thomas	Sweepstakes Creek	Koyuk	O/P Placer
Steve Holmes	Gold King Creek	Bonnifield	O/P Placer
Steve Pomrenke	Martin Creek	Cape Nome	O/P Placer
Taiga Mining Company, Inc.	Aloha Creek	Hughes	O/P Placer
Thomas Stamps	Norton Sound	Cape Nome	S/D - Large
Triple D Mining	Candle Creek	Fairhaven	O/P Placer
Tundra Services	Dexter Creek	Cape Nome	O/P Placer
	EASTERN INTERIOR		
Alan Newby	Little Boulder Creek	Hot Springs	O/P Placer
Alaska Placer Development, Inc.	Livengood Creek	Tolovana	O/P Placer
Big G Mining	Deadwood Creek	Circle	O/P Placer
Bill Bayliss	Franklin Creek	Fortymile	O/P Placer
Bill Lance	Jack Wade Creek	Fortymile	O/P Placer
Bill Miller	Jack Wade Creek	Fortymile	S/D, Recreation
Bill Rushing	Jack Wade Creek	Fortymile	S/D, Recreation
C.J. Hill	Lost Chicken Creek	Fortymile	O/P Placer
Carl Congdon	Quail Creek	Rampart	O/P Placer
Cascade Gold, LLC	Walker Fork	Fortymile	O/P Placer
Charles Zimmerman	Killarney Creek	Hot Springs	O/P Placer
Chris Groppel	Tenderfoot Creek	Fairbanks	O/P Placer
Clearwater Mountain Mining	White Creek	Valdez Creek	O/P Placer
Cy Bras	Canyon Creek	Fortymile	O/P Placer
D. Harvey Bickell	Walker Fork	Fortymile	O/P Placer
Dan Demings	Fortymile River	Fortymile	S/D, Recreation
Daniel Jensen	McCumber Creek	Delta River	O/P Placer
Dave Kukowski	Mosquito River	Fortymile	O/P Placer
Dave Newcomb	White Creek	Valdez Creek	O/P Placer
David Hatch	Dome Creek	Fortymile	S/D - Large
David Hemphill	Ketchum Creek	Circle	S/D - Large
David Howland	Dry Channel	Chistochina	O/P Placer
David Jacobs	California Creek	Bonnifield	O/P Placer

[a]O/P = Open-pit; H/R = Hard-rock; U/G = Underground; S/D = Suction Dredge; Large - Greater than equal to 8" nozzle.
S/D, Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Table 11. *Companies and individuals reported to be producing metal in Alaska, 2006—continued*

Operator	Creek	District	Type[a]
David Jacobs	Eva Creek, Wilson Creek	Bonnifield	O/P Placer
David Jacobs	Moose Creek	Bonnifield	O/P Placer
David Liken	Fortymile River	Fortymile	O/P Placer
David Smith	Deadwood Creek	Circle	O/P Placer
Dean Willis	Crooked Creek	Circle	O/P Placer
Dennis Frost	Slate Creek	Rampart	O/P Placer
Depem	Gilmore Creek, Tom Creek	Fairbanks	O/P Placer
Don Kiehl	Gold King Creek	Bonnifield	O/P Placer
Earl Schene	Uhler Creek	Fortymile	O/P Placer
Earl Vegoren	Rainy Creek	Delta River	O/P Placer
Earth Movers of Fairbanks	Cleary Creek	Fairbanks	O/P Placer
Earth Movers of Fairbanks	Fairbanks Creek	Fairbanks	O/P Placer
Eric Kile	Canyon Creek	Fortymile	O/P Placer
Everett Polley, Jr.	South Fork Fortymile River	Fortymile	S/D, Recreation
Fairbanks Gold Mining Inc.	Fort Knox Mine	Fairbanks	O/P HR
Flint Wolff	Walker Fork	Fortymile	O/P Placer
Forest Hayden	Baby Creek, Squaw Creek	Fortymile	O/P Placer
Four Brothers Mining	Totatlanika River	Bonnifield	O/P Placer
Fred Cornelius	Fox Creek	Fairbanks	O/P Placer
Fred Wilkinson	Ketchum Creek	Circle	O/P Placer
Gary Tainter	Prospect Creek	Koyukuk	O/P Placer
Geoquest	Chicken Creek	Fortymile	O/P Placer
George Seuffert, Jr	Chicken Creek, Mosquito Fork	Fortymile	O/P Placer
George Seuffert, Jr	Faith Creek	Fairbanks	O/P Placer
Gerald Pitcher	Deadwood Creek	Circle	S/D, Recreation
Gerald Standefer	Newman Creek	Bonnifield	O/P Placer
Gold Adventures LLC	Boulder Creek	Hot Springs	O/P Placer
Gold Dust Mines	Big Creek	Chandalar	O/P Placer
Great Divide Mining Co. LLC	Little Boulder Creek	Hot Springs	O/P Placer
Guy Matthews	Kenyon Creek	Fortymile	O/P Placer
Harold Lehman	Slate Creek	Rampart	S/D, Recreation
Harold Mitchell	Mosquito Fork	Fortymile	O/P Placer
Herning Exploration & Mining	Palmer Creek	Fairbanks	S/D, Recreation
Jackson Mining Company	Totatlanika River	Bonnifield	O/P Placer
James Kimbro	Fortymile River	Fortymile	S/D - Large
James Shriner	Deadwood Creek	Circle	O/P Placer
James Treesh	Cherry Creek	Fortymile	O/P Placer
Jay Wood	Teddys Fork, American Creek	Fortymile	O/P Placer
Jean Turner	Fortymile River	Fortymile	O/P Placer
Jeff Owen	Davis Creek	Fortymile	O/P Placer
Jerry Hassel	Ready Bullion Creek	Fairbanks	O/P Placer
Jim Roland	Moose Creek	Bonnifield	O/P Placer
John Lindholm	Any Creek	Fairbanks	O/P Placer
John Schwartz	Our Creek	Fortymile	O/P Placer
John Shilling	Ruby Creek	Rampart	S/D, Recreation
John Shilling	Thanksgiving Creek	Hot Springs	O/P Placer
Judd Edgerton	Napoleon Creek	Fortymile	O/P Placer
Keith Clark	Shamrock Creek	Fairbanks	S/D, Recreation
Kenneth Hanson	Faith Creek	Fairbanks	O/P Placer
Kevin Bergman	Ester Creek	Fairbanks	O/P Placer
KMM Inc.	Hunter Creek	Rampart	O/P Placer
L & L Mining	Eagle Creek	Circle	O/P Placer
L & L Mining	Greenhorn Creek	Circle	O/P Placer
Larry Crouse	Fox Gulch	Fairbanks	O/P Placer

[a]O/P = Open-pit; H/R = Hard-rock; U/G = Underground; S/D = Suction Dredge; Large - Greater than equal to 8" nozzle.
S/D, Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Table 11. *Companies and individuals reported to be producing metal in Alaska, 2006—continued*

Operator	Creek	District	Type[a]
Leo Regner	Lilliwig Creek	Fortymile	O/P Placer
Mack Brooks	Mosquito Fork	Fortymile	S/D, Recreation
Mammoth Mining	Porcupine Creek	Circle	O/P Placer
Melvin Montgomery	Gilliland Creek	Fortymile	O/P Placer
Melvin Montgomery	Jack Wade Creek	Fortymile	O/P Placer
Michael Patrick	Fortymile River	Fortymile	S/D - Large
Nikolaj Marchuk	Rainy Creek	Delta River	O/P Placer
Olson Placers	Ketchum Creek	Circle	O/P Placer
Patrick McCloskey	Deadwood Creek	Circle	O/P Placer
Paul & Company	Crooked Creek	Circle	O/P Placer
Paul & Company	Porcupine Creek	Circle	O/P Placer
Paul Wyszynski	Deadwood Creek	Circle	S/D - Large
Peter Johnson	South Fork Fortymile River	Fortymile	S/D - Large
Polar Mining Inc.	Goldstream Creek	Fairbanks	O/P Placer
Raleigh Cline	Eagle Creek	Fortymile	O/P Placer
Rampart Exploration LLC	American Creek	Hot Springs	O/P Placer
Ray Wolf	Bottom Dollar Creek	Circle	O/P Placer
Ray Wolf	Traverse Creek	Circle	O/P Placer
Raymond Meder	Flume Creek	Fairbanks	O/P Placer
Richard Farkas	Deadwood Creek	Circle	O/P Placer
Richard Loud	Harrison Creek, North Fork Harrison Creek	Circle	O/P Placer
Richard Ott	Omega Creek	Hot Springs	O/P Placer
Richard Swenson	Doric Creek	Hot Springs	O/P Placer
Richard Wilder	Little Boulder Creek	Hot Springs	O/P Placer
Richardson Shield LLC	No Grub Creek	Fairbanks	O/P Placer
Rob Keller	Thistle Creek	Bonnifield	O/P Placer
Robert Hare	Gold Dust Creek	Circle	S/D, Recreation
Robert Kirsch	Kal Creek	Fortymile	O/P Placer
Rodney James	Switch Creek	Circle	O/P Placer
Ron Hill	Fortymile River	Fortymile	S/D - Large
Ronald Tucker	Lillian Creek	Tolovana	O/P Placer
RU Mining LLC	Olive Creek	Tolovana	O/P Placer
Russell Hoffman	Ruby Gulch	Chistochina	O/P Placer
Schmidt Mining	Walker Fork	Fortymile	O/P Placer
Sheldon Maier	Montana Creek	Fortymile	O/P Placer
Sheldon Nielsen	Volcano Creek, Clums Fork Birch Creek	Fairbanks	O/P Placer
Sherlund Mining LLC	Ketchum Creek	Circle	O/P Placer
Silver Jim Stroer	Confederate Creek	Fortymile	S/D, Recreation
Steven Gavora	Fairbanks Creek	Fairbanks	O/P Placer
Steven Olson	Eagle Creek	Circle	O/P Placer
Steven Olson	Liberty Creek	Fortymile	O/P Placer
Teck Pogo, Inc.	Pogo Mine	Goodpaster	U/G HR
Ted Owen	Younger Creek	Fortymile	O/P Placer
Terry Russell	Little Boulder Creek	Hot Springs	O/P Placer
Terry Russell	Ready Money Creek	Hot Springs	O/P Placer
Tim Kelley	North Fork Creek	Hot Springs	O/P Placer
Vernon Thurneau	Fortymile River	Fortymile	O/P Placer
Walter Bohan	Ottertail Creek	Fairbanks	S/D, Recreation
Wanda Severson	Willow Creek	Fortymile	S/D, Recreation
Wayne Duke	North Fork Fortymile River	Fortymile	S/D, Recreation
Wayne Gibson	Golden Creek	Melozitna	O/P Placer
William Aldridge	Poker Creek	Fortymile	O/P Placer

[a]O/P = Open-pit; H/R = Hard-rock; U/G = Underground; S/D = Suction Dredge; Large - Greater than equal to 8" nozzle.
S/D, Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Table 11. *Companies and individuals reported to be producing metal in Alaska, 2006—continued*

Operator	Creek	District	Type[a]
	SOUTHCENTRAL REGION		
Carl Wilbur	Yacko Creek	Nelchina	O/P Placer
Daniel Hartman	Cache Creek	Yentna	S/D, Recreation
David Beyers	Busch Creek	Valdez Creek	O/P Placer
Douglas Weathers	Cache Creek	Yentna	O/P Placer
Estill DeWitt	Alfred Creek	Willow Creek	O/P Placer
Fred Wilkes	Bird Creek	Yentna	O/P Placer
Gary L.Mitchell	Johns Creek	Hope	S/D, Recreation
Gerald Anderson	Yacko Creek	Nelchina	O/P Placer
Girdwood Mining Company	Crow Creek	Anchorage	O/P Placer
Gordon Bartel	Mills Creek	Yentna	O/P Placer
Gordon Richmond	Buchia Creek	Valdez Creek	O/P Placer
Harold Olson	None	Willow Creek	O/P Placer
Hermon Mrak	Willow Creek, Grubstake Creek	Willow Creek	O/P Placer
Jeff Hansen	Peters Creek	Yentna	S/D - Large
Jeff Tubbs	East Fork Sixmile Creek	Seward	S/D, Recreation
Joe VanNote	Mineral Creek	Prince William Sound	S/D, Recreation
Kenneth Lee	Cache Creek	Yentna	O/P Placer
Lillian Zimmer	Quartz Creek	Seward	S/D, Recreation
Mike Spain	Grubstake Creek	Willow Creek	S/D, Recreation
North American Mining	Willow Creek, Little Willow Creek, Peters Creek, Cottonwood Creek, Gopher Creek	Yentna	O/P Placer
Ronald Smith	Hargood Creek	Seward	O/P Placer
Sean Toohey	Crow Creek	Anchorage	S/D, Recreation
Tod Bauer	Gold Creek, Eldorado Creek	Valdez Creek	O/P Placer
Tom Sternberg	Quartz Creek	Hope	S/D, Recreation
Wayne Strauch	Cache Creek	Yentna	S/D, Recreation
	SOUTHWESTERN REGION		
Ben Porterfield	Fish Creek	McGrath	O/P HR
Clark-Wiltz Mining	Ganes Creek	Innoko	O/P Placer
Hanson Industries Inc.	Salmon River	Goodnews	O/P Placer
Harry Faulkner	Ophir Creek	Aniak	O/P Placer
L.E. Wyrick	Granite Creek	Aniak	O/P Placer
Lyman Resources Alaska, Inc.	Crooked Creek, Donlin Creek	Iditarod	O/P Placer
Mark D. Matter	Marvel Creek	Aniak	O/P Placer
Max Agoff	Prince Creek	Iditarod	O/P Placer
Moore Creek Mining	Moore Creek	Innoko	S/D, Recreation
NYAC Mining Company	Bear Creek	Aniak	O/P Placer
NYAC Mining Company	California Creek, Rock Creek	Aniak	O/P Placer
NYAC Mining Company	Sahula Creek	Aniak	O/P Placer
NYAC Mining Company	Shamrock Creek	Aniak	O/P Placer
Richard Busk	Synneva Creek	Aniak	S/D, Recreation
	ALASKA PENINSULA		
Alex Ameson	Beach sands	Kodiak	S/D, Recreation
	SOUTHEASTERN REGION		
Chilkat Mining LLC	Porcupine Creek	Juneau	O/P Placer
Earle Foster	Porcupine Creek	Juneau	O/P Placer
John Schnabel	Porcupine Creek	Juneau	O/P Placer
Kennecott Greens Creek	Greens Creek Mine	Admiralty	U/G HR
Kenneth Schultz	NA	Ketchikan	O/P Placer
Snow Lion II, Ltd	Porcupine Creek	Juneau	O/P Placer

[a]O/P = Open-pit; H/R = Hard-rock; U/G = Underground; S/D = Suction Dredge; Large - Greater than equal to 8" nozzle.
S/D, Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

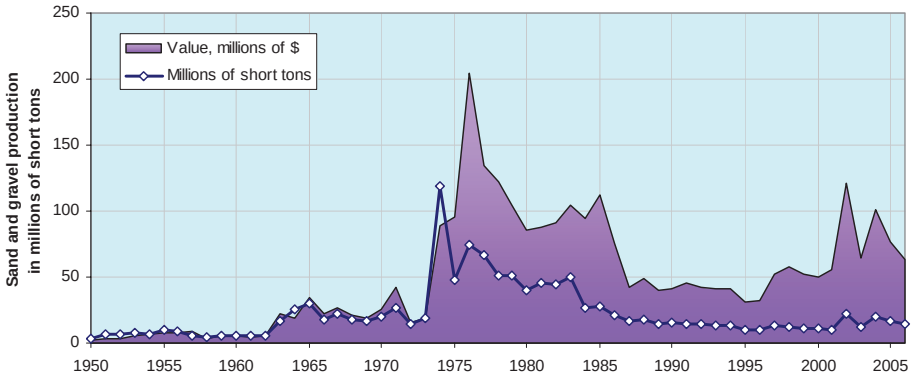


Figure 31. *Sand and gravel production in Alaska 1950–2006.*

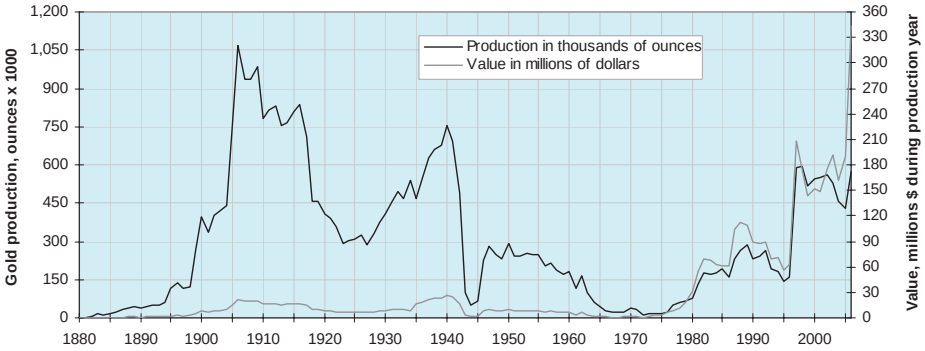


Figure 32. *Amount of value of gold production in Alaska, 1880–2006.*

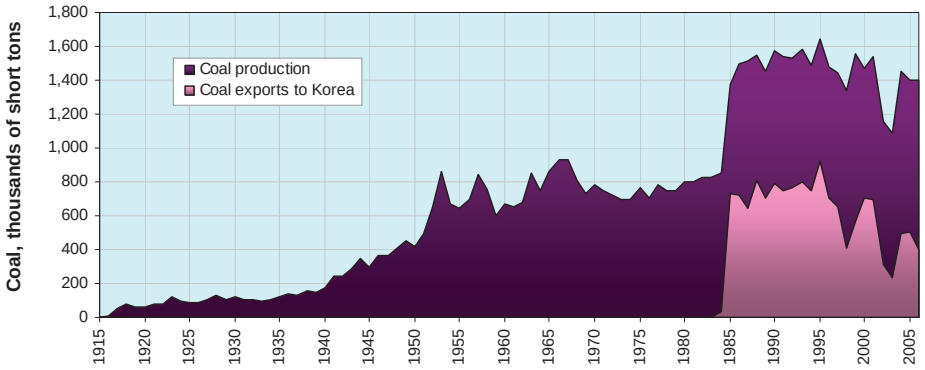
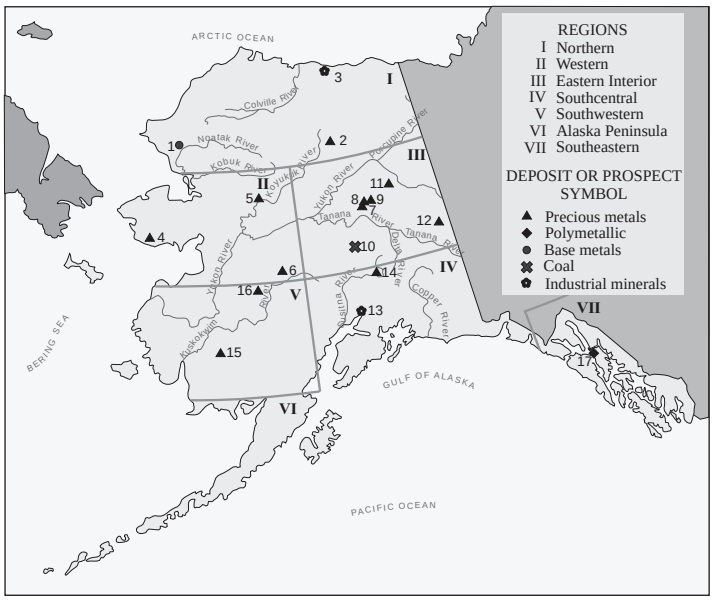


Figure 33. *Coal production in Alaska, 1915–2006, including exports to Korea.*

Metals, with a value of $2,721.1 million, accounted for 95.2 percent of the total value of mineral production. Zinc continued to be the most valuable product by a significant margin, reporting 70.08 percent of the total and 73.6 percent of the metal value. This was followed by gold at 12.04 percent of the total and 12.64 percent of the metal value. Silver assumed third place at 6.66 percent of the total and 7.00 percent of the metal value. Lead descended to fourth with a total value of 6.42 percent of the total value and 6.75 percent of the metal value.

Alaska mineral production by sector is shown in figure 35. Values of production in decreasing order were from Red Dog (72.6 percent), Greens Creek (11.9 percent), Fort Knox (7.0 percent), rock, sand and gravel (3.1 percent), other gold mines (Pogo, other) (2.4 percent), coal and peat (1.7 percent) and placer gold operations (1.3 percent).

Table 12 shows the average metal values used in this report over the last 13 years. Some respondents reported costs and unit values for production. In general, however, metal values were computed from weekly averages on the



London Metal Exchange, and do not take into account mining, shipping, smelting, and other costs incurred by the reporting/producing company. Across-the-board metal price increases are noted from those experienced in 2005; those increases contributed substantially to the increase in value of production.

The production estimates included in this report are from 144 questionnaires returned by miners, mining companies, Native organizations, government agencies, municipalities, and service companies, complemented by well over 200 telephone calls, e-mails, faxes, searches of annual reports, 10-K reports, and news releases by producers. Additional information was derived from State of Alaska Annual Placer Mining Applications (APMA's) submitted to the DMLW.

I Northern Region

1. Teck Cominco Alaska Inc. Red Dog Mine, Noatak district—zinc–lead–silver (germanium)
2. Placer gold mines—gold
3. Prudhoe Bay and Kuparuk pits (numerous)—sand and gravel

II Western Region

4. Nome—placer gold, sand and gravel
5. Placer gold mines—gold
6. Placer gold mines—gold

III Eastern Interior Region

7. Polar Mining Inc., Fairbanks district—gold–silver–screened aggregate
8. Kinross Gold Corp. Fort Knox Mine, Fairbanks district—gold–silver; placer mines
9. Earth Movers of Fairbanks Inc., Fairbanks district—gold placer
10. Usibelli Coal Mine Inc., Bonnifield district—coal
11. Placer gold mines—gold
12. Placer gold mines—gold

IV Southcentral Region

13. Palmer–Anchorage district—sand and gravel
14. Placer gold mines—gold

V Southwestern Region

15. Nyac Mining Co., Nyac district—gold–silver
16. Placer gold mines—gold

VI Alaska Peninsula Region

VII Southeastern Region

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

Figure 34. *Selected production projects, 2006.*

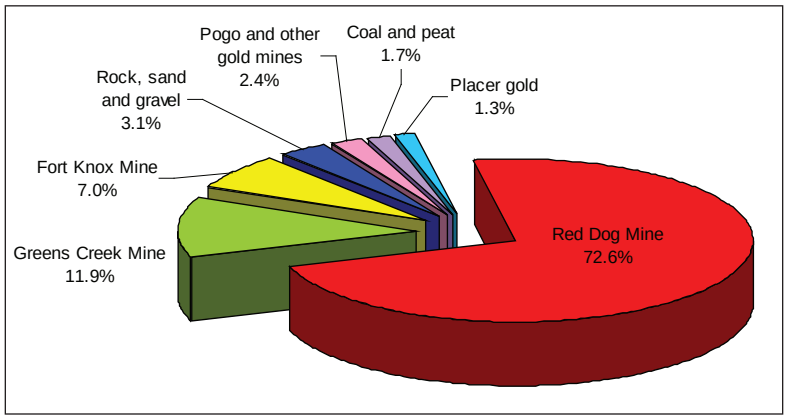


Figure 35. *Alaska mineral production by sector, 2006.*

The authors wish to thank the Alaska Railroad Corp., the Alaska Mental Health Trust Land Office, the Alaska Department of Transportation & Public Facilities, the Alaska Division of Mining, Land & Water, municipalities, the U.S. Forest Service, the U.S. Bureau of Land Management, Native regional corporations, and the Alyeska Pipeline Service Co. for providing information for this section of the report.

Tables 13 and 14 show gold production by region of the state, and the placer production by small and medium sized producers. Three placer operations achieved a "large sized" rating. Hard-rock (lode) gold production increased 26.8 percent, from 402,120 ounces in 2005 to 509,747 ounces in 2006. Placer gold production increased significantly (nearly 150 percent) from 24,911 ounces in 2005 to 60,382 ounces in 2006. The increase in hard rock

Table 12. *Average metal prices, 1994–2006*

	Gold $/oz	Silver $/oz	Copper $/lb	Lead $/lb	Zinc $/lb
1994	386.00	5.41	1.05	0.35	0.45
1995	395.00	5.43	1.33	0.34	0.48
1996	387.60	5.19	1.03	0.37	0.49
1997	330.76	4.91	1.03	0.28	0.59
1998	293.88	5.53	0.75	0.24	0.46
1999	278.70	5.20	0.71	0.23	0.49
2000	279.10	4.96	0.82	0.21	0.51
2001	271.04	4.37	0.71	0.22	0.40
2002	310.06	4.61	0.41	0.21	0.35
2003	363.38	4.88	0.81	0.23	0.38
2004	409.72	6.67	1.29	0.40	0.47
2005	444.74	7.32	1.61	0.43	0.63
2006	603.46	11.55	3.02	0.58	1.47

Table 13. *Reported refined gold production, number of operators, and industry employment in Alaska, 2004–2006*[a]

Region	Number of operators			Production in ounces			Number of employees[b]		
	2004	2005	2006	2004	2005	2006	2004	2005	2006
Northern	6	3	20	198	60	1,910	8	3	40
Western	11	16	41	16,546	12,649	14,900	28	61	58
Eastern Interior	42	37	100	351,937	339,414	474,900	459	453	821
Southcentral	4	11	25	262	385	5,837	2	64	36
Southwestern	3	3	9	1,346	1,511	8,773	1	14	25
Alaska Peninsula[c]	-	-	1	-	-	-	-	-	-
Southeastern[d]	3	2	5	96,196	73,014	63,809	267	252	255
TOTAL	**69**	**72**	**201**	**466,485**	**427,031**	**570,129**	**765**	**845**	**1,235**

[a]2006 production includes 509,747 ounces of gold from hardrock mines and 60,382 ounces of gold from placer sources.
[b]Includes recreation numbers (operators, ounces, employees) for 2006 and is calculated on the basis of full-year employment.
[c]Production from this single source is combined with southwestern production for confidentiality purposes.
[d]Includes Greens Creek employment which is a polymetallic producer, with a strong gold component.

Table 14. *Production for selected Alaska placer gold mines, 2000–2006*

Mine Size	2000	2001	2002	2003	2004	2005	2006
				Number of mines			
Small[a]	60	33	43	58	60	50	177
Medium[b]	14	5	4	4	5	20	21
Large[c]	4	4	2	2	3	1	3
TOTAL	**78**	**42**	**49**	**64**	**68**	**71**	**201**
				Production in ounces[d]			
Small	8,981	5,048	9,931	8,124	7,621	6,783	23,343
Medium	15,186	6,234	4,739	4,976	4,504	17,822	22,144
Large	22,147	11,559	7,711	10,500	15,950	--[e]	14,895
TOTAL	**46,314**	**22,841**	**22,381**	**23,600**	**28,075**	**24,605**	**60,382**

[a]<650 oz gold/yr.
[b]650-2,500 oz gold/yr.
[c]>2,500 oz gold/yr.
[d]Does not include recreational production before 2006.
[e]2005 production combined with "Medium" producers.

production reflects higher output from Fort Knox and new production from Pogo. Production should increase fairly significantly during 2007 as a result of higher production from the Pogo Mine, initial production from Nixon Fork, Kensington, and Rock Creek/Big Hurrah. Thereafter, gold production should increase annually with full commissioning of Nixon Fork, Rock Creek/Big Hurrah, Kensington, and eventually Donlin Creek mines.

Tables 15 and 16 show the value and regional importance of sand, gravel, and rock stockpiling and sales. Sales of sand and gravel in 2006 totaled 14.0 million tons, down by 2.6 million tons from 2005. Rock use was 2.4 million tons, down from the 2.8 million tons in 2005. These numbers reflect some shortfall in reporting, but mainly reflect curtailments or reductions in production.

Coal production from Usibelli Coal Mine in 2006 was 1,397,500 tons, down slightly from 1,402,174 tons in 2005. Exports were reported to be 476,000 tons, of which 397,000 tons were from 2006 production; the balance was from previous year's production that was stockpiled at Seward. Shipments to Korea and Chile were 399,000 and 77,000 tons, respectively. The balance of the production was consumed by local power plants.

Peat resources harvested and sold were 66,500 cubic yards in 2006 compared to 62,532 cubic yards in 2005. The 2006 production is believed to be higher by a fairly significant number; at least three significant producers declined to or otherwise did not report production.

The export value of minerals was $1,196 million for 2006, just shy of double the $603 million reported for 2005. The 2006 export value is the highest export value on record (table 17, fig. 36). This amount exceeds last year's value by $593 million.

Table 15. *Reported sand and gravel production and industry employment in Alaska by region, 2006*

Region	Companies and agencies reporting[a]	Tons	Estimated unit value ($/ton)[b]	Total value	Estimated number of employees
Northern	6	5,631,624	$4.33	$24,403,704	120.3
Western	8	558,281	5.40	3,015,823	8.5
Eastern Interior	11	1,161,190	6.93	8,048,490	99.7
Southcentral	57	6,422,101	4.22	27,101,909	105.0
Southwestern	- -	- -	- -	- -	- -
Alaska Peninsula	- -	- -	- -	- -	- -
Southeastern	12	180,268	4.33	781,163	3.9
TOTAL	**94**	**13,953,464**	**$4.54**	**$63,351,089**	**337.4**

[a]From 49 returned questionnaires, more than 100 telephone surveys, follow-up fax questionnaires, more than 100 e-mails to probable producers, etc. Data were also returned from the Alaska Railroad, Alyeska Pipeline Service Co., DML&W, USFS, BLM, USFS, regional corporations, and others.
[b]Values are based on estimates from producers.
- - = Not reported.

Table 16. *Reported rock production and industry employment in Alaska by region, 2006*[a]

Region	Companies and agencies reporting[b]	Tons	Estimated unit value ($/ton)[c]	Total value	Estimated number of employees
Northern	3	20,354	$12.00	$ 244,242	1.2
Western	1	52,271	12.00	627,252	3.0
Eastern Interior	8	737,544	$4.94	3,643,952	25.3
Southcentral	11	386,567	12.85	4,968,804	10.7
Southwestern	- -	- -	- -	- -	- -
Alaska Peninsula	- -	- -	- -	- -	- -
Southeastern	9	1,173,002	$12.24	$14,361,774	64.0
TOTAL	**32**	**2,369,738**	**$10.06**	**$23,846,024**	**104.2**

[a]Includes shot rock, crushed stone, D-1, riprap, and modest quantities of ornamental stone.
[b]From 15 returned DGGS questionnaires, more than 100 telephone surveys, follow-up fax questionnaires, more than 100 e-mails to probable producers, etc. Data were also returned from the Alaska Railroad, Alyeska Pipeline Service Co., DML&W, DOT&PF, USFS, BLM, USFS, regional corporations, and others.
[c]Values are based on estimates from producers, from historic records, etc.
- - = Not reported.

NORTHERN REGION

Teck Cominco Ltd.–NANA Regional Corp's Red Dog Mine near Kotzebue in northwestern Alaska in 2006 milled 3,569,280 tons of ore, 166,449 tons more than in 2005 (table 18). Ore grade for 2006 was 20.6 percent zinc and 6.1 percent lead compared to 2005 values of 21.7 and 5.6 percent, respectively. Resulting metal production for 2006 was lower for zinc and higher for lead than in 2005 as a result of volume and respective grade differences; 614,538 tons of zinc and 136,135 tons of lead in concentrate were produced compared to 2005 values of 626,112 tons of zinc and 112,766 tons of lead. Silver production in 2006 was 7.62 million ounces compared to a credit in 2005 of 1.97 million ounces. The method of reporting silver in 2006 and years prior to 2005 was to credit 56.0 ounces per ton of lead in concentrate. The 2005 silver production numbers were provided by Teck's annual report and reflect the credit to Red Dog Mine for this metal.

Table 17. *Alaska international mineral exports*

	Export value (millions)
1996	$ 249
1997	369
1998	317
1999	359
2000	293
2001	329
2002	380
2003	414
2004	505
2005[a]	603
2006[a]	$1,196

Source: U.S. Census Bureau, Origin of Movement Series

[a]Includes mineral/metal ores and concentrates, coal, and unwrought, nonmonetary gold exports.

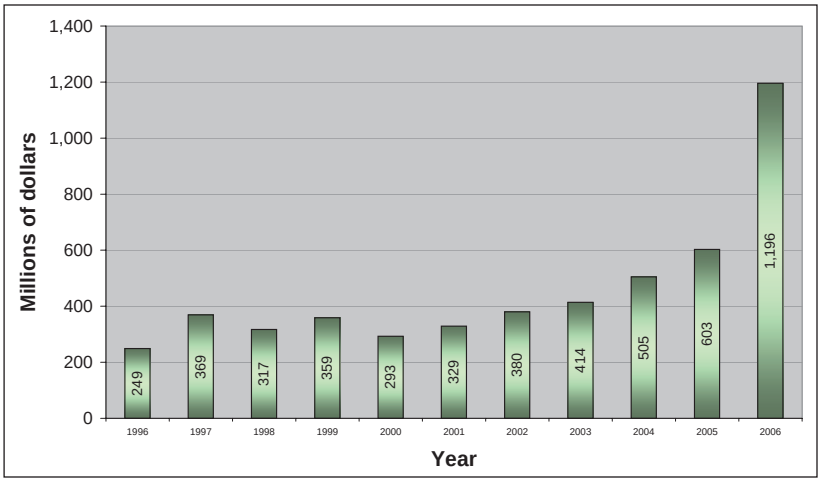


Figure 36. *Alaska international mineral exports, 1996–2006.*

Table 18. *Red Dog Mine production statistics, 1989–2006*[a]

	Tons Milled	Ore Grade Zinc %	Lead %	Silver oz/ton	Total Tons Concentrate Produced[b]	Contained Tons Zinc	Contained Tons Lead	Million Ounces Silver[c]	Employees
1989	33,300	20.4	7.6	3.6	8,532				228
1990	996,700	26.5	8.5	3.6	443,600	191,981	31,187	1.60	350
1991	1,599,300	22.5	6.6	2.8	521,400	234,510	43,815	1.46	331
1992	1,582,000	19.9	6.0	2.9	474,900	231,363	15,960	1.38	349
1993	1,874,600	18.4	5.7	2.8	539,800	255,149	24,788	1.51	376
1994	2,339,500	18.8	5.7	2.8	658,000	328,160	32,775	1.84	391
1995	2,485,900	19.0	5.8	2.8	753,600	358,676	55,715	3.62	397
1996	2,312,600	18.7	5.0	2.8	765,300	357,680	65,886	4.30	417
1997	2,127,000	20.3	5.2	2.9	799,400	373,097	69,284	4.27	479
1998	2,752,587	21.4	5.2	2.7	1,015,773	490,461	80,193	5.20	466
1999	3,282,788	21.3	5.2	2.7	1,207,160	574,111	97,756	6.21	539
2000	3,365,508	21.0	4.7	2.5	1,211,539	585,030	91,557	5.84	536
2001	3,560,430	19.8	5.0	2.5	1,215,837	570,980	105,000	5.90	559
2002	3,489,600	21.1	5.4	2.7	1,366,480	637,800	118,880	6.75	560
2003	3,476,689	21.7	6.2	3.1	1,397,246	638,569	137,679	7.70	388
2004	3,249,613	22.0	6.0	3.0	- -	610,900	128,970	7.22	508
2005	3,402,831	21.7	5.6	3.0	- -	626,112	112,766	1.97	449
2006	3,569,280	20.6	6.1	3.0	- -	614,538	136,135	7.60	457

aRevised slightly from Special Report 51, Alaska's Mineral Industry 1995, based on new company data.

[b]Totals for years 1990 through 1995 include bulk concentrate.

[c]Estimate calculated at 56 ounces per ton of lead metal produced to 2004, as reported credit for 2005, net of treatment charges.

- - = No concentrate produced.

Employment at Red Dog in 2006 was 457 persons including contract personnel. The mine provides direct employment for approximately 360 people. An additional 100 people work for either (1) NANA Management Services Inc., providing camp management, housekeeping, catering, and other services, or (2) NANA/Lynden LLC, hauling fuel, freight, and concentrate between the mine and port. Better than 50 percent of the employees are NANA shareholders.

The Alaska mineral industry has had an outstanding safety record in recent years. Unfortunately, a fatal injury occurred at Red Dog Mine this year. Jeffrey A. Huber, a staff geologist at the Red Dog Mine since 2004 and a University of Alaska alumnus, was killed on December 15, 2006, when he was struck by rock falling from the mining face while performing routine grade control. Additional precautions and a review of work practices have been undertaken at Teck Cominco operations to prevent this type of tragedy in the future.

The Red Dog Mine produces the highest quantity of zinc in the world and dominates Alaska's mineral production value. Red Dog accounted for 58.8 percent of the annual value of Alaska's mineral industry. The mine is 100 percent owned and operated by Teck Cominco Alaska under an agreement with NANA Regional Corp., a Native development corporation. The mine comprises a number of sedimentary exhalative (SEDEX) lead–zinc sulfide deposits hosted in Mississippian- to Pennsylvanian-age sedimentary rocks. The ore bodies are lens shaped and occur within structurally controlled (thrust fault) plates. The sulfide mineralization consists of semi-massive to massive sphalerite, pyrite, marcasite, and galena. The mining method employed is conventional drill and blast open-pit mining. The main pit has an expected life of 6 years at current rates of production. Additional reserves have been identified in the vicinity of the processing facilities sufficient to extend the life of the operation by an additional 16 years for a total mine life of 22 years.

The mineral processing facilities employ conventional grinding and sulfide flotation methods to produce zinc and lead concentrates. The shipping season at Red Dog is restricted to approximately 100 days per year because of sea ice conditions, and Red Dog's sales are seasonal with the majority of sales in the last five months of each year. Concentrate is stockpiled at the port facility and is typically shipped between July and October.

Operating costs increased 16 percent in 2006 as a result of escalating fuel, reagent, and grinding media costs. Capital expenditures were $28 million during the year. The operation reported a $951.5 million profit for 2006.

Reserves and resources at Red Dog are shown in table 19.

Teck Cominco pays NANA an annual advance royalty equal to the greater of 4.5 percent of Red Dog Mine's net smelter return or $1 million. In 2006, the advance royalty amounted to $51 million. After the company recovers certain capital expenditures including an interest factor, Teck Cominco will pay to NANA 25 percent of net proceeds of production from the Red Dog Mine, increasing in 5 percent increments every fifth year to a maximum of 50 percent. Advance royalties previously paid will be recoverable against the 25 percent royalty on net proceeds. Cumulative advance royalty payments were $104 million as of December 31, 2006.

For the second consecutive year, Red Dog personnel participated in an emergency erosion control effort at the nearby village of Kivalina. During the summer, a seawall had been constructed to protect the shoreline and prevent erosion and property damage from ocean storms. A storm in October 2006 collapsed a major section of the wall and jeopardized a fuel storage facility. Red Dog provided materials, equipment, and manpower to help repair the erosion control barrier.

Silverado Gold Mines Ltd. continued underground development efforts at the Nolan Creek property into the early months of 2006, and then washed the 2005–06 winter-mined material during summer months of 2006. The property is approximately 6 miles northwest of Wiseman on the south flank of the Brooks Range. Effort was directed at development of the Swede Channel, an elevated deeply buried channel on the east side of Nolan Creek. Approximately 900 feet of the channel were developed to produce approximately 2,900 bank cubic yards (bcy) of gold-bearing gravel. An additional 3,200 bcy of gravel was mined from other undefined portions of the Swede Channel, bringing the total stockpile to 6,100 bcy. Gold recovered during 2006 amounted to 939 ounces (fig. 37). The gold is very coarse and returns premium prices of collector/jewelry values up to twice, possibly even more, the prevailing spot price. Ore resource estimates based on drilling and conventional polygonal methods of determination indicated 5,000 bcy of resource with a grade of 0.275

Table 19. *Reserves and resources by category at the Red Dog Mine as of December 31, 2006 (Teck Cominco Ltd. 2006 annual report)*

Class	Metal	Category	Tons, million	Grade, percent
Reserves	Zinc	Proven	17.64	20.2
		Probable	58.1	16.7
	Lead	Proven	17.64	5.6
		Probable	58.1	4.3
Resources	Zinc	Indicated	8.5	18.9
		Inferred	33.3	15.5
	Lead	Indicated	8.5	5.4
		Inferred	33.3	4.5

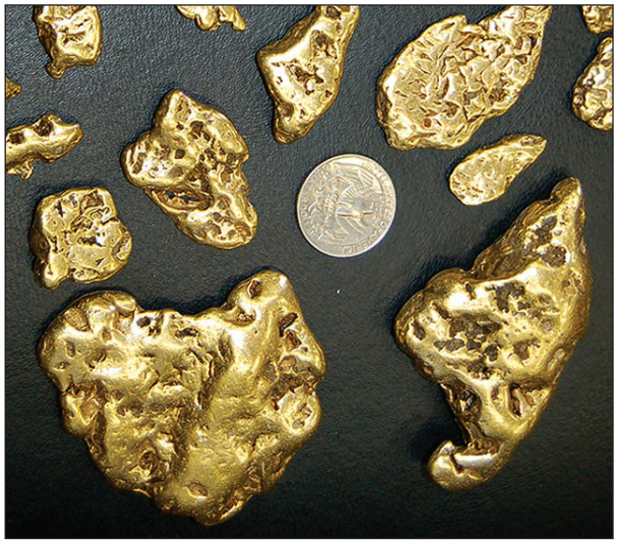


Figure 37. *Nine ounces of coarse placer gold nuggets mined during 2006 at the Nolan Creek Mine. Photo courtesy of Silverado Gold Mines Ltd.*

oz/bcy in the channel. Underground mining resumed during the winter months of 2006 and early 2007 to produce 18,000 loose cubic yards of material to be washed during the summer months of 2007.

Nineteen other placer operations, five recreational in size, reported operating in the northern region during the year as opposed to three placer operations during 2005. Total placer gold production for the region was estimated to be 1,910 ounces.

Sand and gravel production from the region was higher in 2006 than in 2005. Six operations reported an estimated 5,631,624 tons of sand and gravel in 2006 compared to nine operations that produced 1,282,728 tons in 2005. Rock production in 2006 was slightly lower at 20,354 tons from three producers; 2005 production was estimated to be 21,412 tons from one producer.

WESTERN REGION

Forty-one placer operations, five recreational in size, reported production in the region for 2006 compared to 16 for 2005. Reported production in 2006 was 14,900 ounces compared to a production of 12,649 ounces for 2005. Employment in 2006 was estimated to be 58 employees compared to 61 for 2005.

Sand and gravel production from the region was reported to be 558,281 tons from eight operations. This compared to 699,000 tons of production during 2005 from 20 operations. Employment was estimated to be 8.5 full-time-equivalent employees in 2006 compared to 5.5 during 2005.

Rock production from the region during 2006 was reported to be 52,271 tons from one operation. This compares to 152,000 tons for 2005 from four operations. Employment for 2006 was estimated to be 3.0 persons compared to 3.7 for 2005.

EASTERN INTERIOR REGION

Fairbanks Gold Mining Inc. (FGMI), a wholly-owned subsidiary of Kinross Gold Corp., is the operator of Fort Knox Mine, located approximately 15 miles northeast of Fairbanks. FGMI recovered 333,383 ounces of gold during 2006, up 4,063 ounces from the 329,320 ounces produced in 2005 (fig. 38). Ore production decreased by 6 percent to an average of 33,900 tons per day from an average of 36,200 tons per day in 2005. The decrease was due to longer and steeper haul routes from the deepening of the open pit. Mining occurred within Phases 4, 5 and 6; Phase 6 was the only active phase at the end of the year. Mill throughput was 14,839,297 tons. Mill feed is first crushed to minus 8 inches in the primary gyratory crusher. Semi-autogenous (SAG) milling in combination with two ball mills and hydrocyclones further reduces the size of material. The sized ore flows to a high-rate thickener then to leach tanks where cyanide is used to dissolve the gold. Activated carbon is used in a carbon-in-pulp circuit to absorb the gold from the cyanide solution. Loaded carbon particles are removed from the slurry by screening and are transferred to the gold recovery circuit for separation and recovery as bullion. Total mined material for 2006 amounted to 51,070,000 tons, including 35 million tons of stripped material. As a result of high metal prices, Kinross royalties and production taxes were $2.2 million in 2006, compared to none in 2005. Employment averaged 406 persons during the year. See table 20 for further information.

Fort Knox mine had year-end proven and probable reserves of 176,009,000 tons of ore with a grade of 0.01537 ounces of gold per ton. In addition, the project had a measured and indicated resource of 78,577,000 tons of ore with a grade of 0.0200 ounces per ton.

Figure 38. *Sparks fly during steel grinding at the Fort Knox Mine mill. Photo courtesy of Fairbanks Gold Mining Co.*

Table 20. *Fort Knox Mine production statistics, 1996–2006*

	Tons Mined (ore + waste)			Tons Milled (ore)				
	Fort Knox	True North[a]	Total	Fort Knox	True North[a]	Total	Ounces Produced	Employment
1996	16,684,000		16,684,000	769,700		769,700	16,085	243
1997	32,380,000		32,380,000	12,163,151		12,163,151	366,223	249
1998	33,294,000		33,294,000	13,741,610		13,741,610	365,320	245
1999	30,350,000		30,350,000	13,819,010		13,819,010	351,120	253
2000	35,600,000		35,600,000	15,000,000		15,000,000	362,929	253
2001	25,957,900	8,448,400	34,406,300	13,282,614	2,377,386	15,660,000	411,220	360
2002	24,583,500	11,461,000	36,044,500	11,887,200	3,371,800	15,259,000	410,519	360
2003	30,597,940	12,707,100	43,305,040	11,473,000	3,611,682	15,084,682	391,831	316
2004	44,187,000	3,763,000	47,950,000	12,917,966	1,675,854	14,593,820	338,334	427
2005	63,248,000	- -	63,248,000	14,384,842	- -	14,384,842	329,320	411
2006	51,070,000	- -	51,070,000	14,839,297	- -	14,839,297	333,383	406

[a]True North started production in 2001 and suspended production in 2004.
- - = Not reported.

FGMI has identified the potential to expand the existing Fort Knox pit along the south and west sides (Phase 7 expansion), allowing for an additional 33.1 million tons of mining production. Phase 7 stripping is currently planned to begin in the third quarter of 2008 and stripping will continue until 2011, at which point sustained ore feed for the mill will be reached. If the Walter Creek heap leach facility permits are approved, Phase 7 will allow the Fort Knox pit production to continue until 2015. Stockpile material will continue to be mined and placed on the Walter Creek heap leach facility until 2017. The mill is planned to operate until 2015 when mill grade material is depleted from Phase 7. If Phase 7 and the Walter Creek Heap Leach are not approved, Fort Knox mine production will end in 2010 and mill production in 2012.

The Pogo Mine, operated by Teck Pogo Inc., was mostly considered to be in the development phase in 2006 due to startup problems and efforts to overcome those problems. Teck Pogo is a subsidiary of Teck Cominco, which owns a 40 percent interest in the Pogo deposit. Co-owners are Sumitomo Metal Mining Co., which owns a 51 percent interest, and Sumitomo Corp., holding a 9 percent interest in the mine. The operation mined 447,129 tons of ore and treated 338,000 tons. Gold recovery amounted to 113,364 ounces. Average employment for the year, not including contractor employees, was 297 full-time-equivalent employees. Reserves at Pogo are listed as 6.93 million tons with a grade of 0.497 ounces per ton. The operation is forecast to produce 340,000 ounces of gold during 2007.

Usibelli Coal Mine Inc. operated for the entire year at their Two Bull Ridge site (fig. 39). Total sub-bituminous coal production amounted to 1,397,500 tons for 2006 compared to 1,402,174 tons for 2005. Exports were reported to be 480,000 tons during 2006 compared to 502,758 tons in 2005. Chile received 81,000 tons of coal in 2006 compared to 102,925 tons for 2005. Korea was sent 399,000 tons in 2006 compared to 399,833 tons the previous year. Employment in 2006 was reported to be 95 full-time-equivalent persons.

Usibelli achieved a very significant safety accomplishment of no lost time injuries for a record period at its operation. The record extended from January 27, 2004, through April 3, 2006. Collectively, the mine achieved 797 days of continuous operations without a lost time injury. This safety record is one of the lowest in Alaska and the country's mining industry. Low severity and frequency rates have been experienced by the 95-person work force during the past 5 years. Usibelli Coal Mine Inc. was also recognized for its outstanding environmental stewardship at the December 2006 Northwest Mining Association (NWMA) Convention.

Placer gold production for 2006 was reported to be 28,153 ounces compared to 10,094 ounces from the region for 2005. One hundred operators were reported for 2006, compared to 37, sixteen of which were recreational in size,

Figure 39. *Loader and truck mining subbituminous coal at Usibelli Coal Mine. Photo courtesy of Usibelli Coal Mine Inc.*

for 2005. One hundred and eighteen full-time-equivalent jobs were calculated for the year.

Sand and gravel produced in 2006 amounted to a reported 1.16 million tons from 11 operators, compared to 7.2 million tons from 29 operations in 2005. Employment during 2006 was estimated to be 100 full-time-equivalent positions compared to 282 for 2005. The decline is thought to be explained mostly by lack of reporting.

Rock production amounted to 737,544 tons in 2006 compared to 524,000 tons for 2005. Employment was reported to be 25 full-time-equivalent persons in 2006 compared to 27 persons in the previous year. The numbers are considered to be reasonably accurate.

Peat (topsoil) production was reported to be 25,000 cubic yards during 2006, compared to 15,500 cubic yards for 2005. Incomplete reporting continues to be noted for this region, possibly resulting in under-reporting by a factor of up to 30 percent. For 2006, four full-time-equivalent jobs are credited to this product compared to one full–time-equivalent job for 2005.

SOUTHCENTRAL REGION

Rock, sand, gravel, and peat (topsoil) continue as the most valuable commodities produced for this region. The southcentral region was the largest producer of these products, with 71 operators reporting for 2006 compared to 49 operators for 2005. Sand and gravel production amounted to 6.42 million tons for the year, compared to 7.11 million tons for 2005. In 2006, sand and gravel provided an equivalent of 105 full-time jobs, compared to 79 full-time jobs for 2005. Rock production in 2006 was 386,567 tons compared to 600,000 tons in 2005. Rock-producing operators provided an equivalent of 11 full-time jobs in 2006 compared to 33 full-time-equivalent jobs for 2005. Reported peat production totaled 41,500 cubic yards, compared to 47,000 cubic yards during 2005. Full-time-equivalent jobs were reported to be seven for 2006, compared to five for 2005. Reporting shortfalls are fairly significant and could be up to 50 percent below actual numbers. Further details can be seen in tables 15 and 16.

Placer gold production reported for this region during 2006 was 5,837 ounces, compared to 385 ounces for 2005. Twenty-five operators reported, ten of which were considered recreational in size; this compares to 11 operators in 2005, although no segregation by size was made for 2005. Total full-time-equivalent employment in 2006 amounted to 36 positions, compared to 64 for 2005. The apparent discrepancy in job numbers cannot be explained, but could possibly have resulted from over-reports for 2005. One gemstone operator is included in the placer numbers and no segregation is provided for confidentiality reasons.

SOUTHWESTERN REGION

Placer gold production from the region during 2006 amounted to 8,706 ounces, compared to 1,511 ounces for 2005. Calculated full-time-equivalent employment was 24 persons, compared to 14 for 2005. Nine operators, two considered recreational in size, conducted mining in 2006 compared to three operators during 2005.

No rock, sand, or gravel production was reported from the region during 2006; this compares to one operation during 2005. This difference is believed to be a reporting shortfall rather than a reduction in production.

ALASKA PENINSULA REGION

No rock, sand, or gravel production was reported from the region during 2006, compared to one operation during 2005. One recreational placer miner reported working during the year.

SOUTHEASTERN REGION

The southeastern region reported polymetallic, rock, sand and gravel, and placer gold production for 2006. Total mineral industry production employment for the region in 2006 was approximately 489 full–time-equivalent jobs, compared to 341 for 2005.

Greens Creek Mine, a Kennecott Minerals Co.–Hecla Mining Co. joint venture in southeastern Alaska, is a polymetallic volcanogenic massive-sulfide deposit (silver, zinc, gold, lead, and copper) and one of the largest silver producers in the world. The mine produces a silver–gold doré and sulfide concentrates containing zinc, lead, and minor copper; copper production is no longer reported. Greens Creek Mine is operated by Kennecott Minerals Co., which owns 70.3 percent; Hecla Mining Co. owns the remaining 29.7 percent.

Greens Creek Mine reported a mill throughput in 2006 of 732,176 tons, compared to 717,600 tons for 2005 (table 21. Recoverable metal production for 2006 was 8,865,818 ounces of silver, 62,935 ounces of gold, 59,429 tons of zinc, and 20,992 tons of lead.

Currently, Greens Creek is mining approximately 2,200 tons of ore per day from underground operations. Ore from the underground trackless mine is milled at the mine site. The mill produces gold doré from gravity concentrates, lead, zinc, and bulk concentrates. Generally, the mine ships concentrates to Korea, Japan, Mexico, and Canada for smelting and metals recovery. Gold doré produced from the gravity circuit is shipped to other points in the U.S. for refining; this accounts for approximately 20 percent of the recovered gold. Employment at the mine in 2006 was 245 full-time-equivalent positions for the year credited to the production operations. Development employment, including contractors, is reported in the development section.

The Greens Creek project had year-end reserves of 7,677,679 tons with grades of 0.1126 ounces gold per ton, 14.42 ounces silver per ton, 3.98 percent lead, and 10.39 percent zinc.

Rock, sand, and gravel operations in 2006 in the southeastern region produced 1.353 million tons of material compared to 1.776 million tons during 2005. Twenty-one operators reported production during the year compared to 14 operations during 2005. Production in 2006 was down by 423,000 tons from 2005, although the number of operators was higher. Employment for 2006 was reported to be 68 full-time-equivalent positions, compared to 89 jobs for 2005.

Placer mining activity was much more robust during 2006 than in previous years. Five operators reported production of 874 ounces of gold. Calculated employment was 10 full-time–equivalent jobs for the year.

No peat production was reported during the year.

Table 21. *Greens Creek Mine production statistics, 1989–2006*

			Contained Metal					
	Tons Milled	Tons Concentrate	Tons Zinc	Tons Lead	Tons Copper[a]	Ounces Gold	Ounces Silver	Employees
1989	264,600	--	187,007	9,585	--	23,530	5,166,591	235
1990	382,574	--	37,000	16,728	--	38,103	7,636,501	265
1991	380,000	--	41,850	16,900	--	37,000	7,600,000	238
1992	365,000	113,827	40,500	16,500	--	32,400	7,100,000	217
1993[b]	77,780	--	9,500	3,515	--	7,350	1,721,878	217
1994[c]	--	--	--	--	--	--	--	--
1995[c]	--	--	--	--	--	--	--	--
1996[b]	135,000	43,000	9,100	4,200	193	7,480	2,476,000	265
1997	493,000	--	46,000	19,000	1,300	56,000	9,700,000	275
1998	540,000	--	58,900	22,700	1,300	60,572	9,500,000	275
1999	578,358	--	68,527	25,503	1,400	80,060	10,261,835	275
2000	619,438	--	84,082	31,677	1,400	128,709	12,424,093	275
2001	658,000	--	63,903	22,385	1,400	87,583	10,900,000	275
2002	733,507	217,200	80,306	27,582	1,600	102,694	10,913,183	262
2003	781,200	--	76,200	24,800	--	99,000	11,707,000	295
2004	805,789	--	69,115	21,826	--	86,000	9,707,000	265
2005[d]	717,600	--	58,350	18,600	--	72,800	9,700,000	265
2006[e]	732,176	--	59,429	20,992	--	62,935	8,865,818	245

[a]No copper credits in 1989–1993 and 2003–2006.
[b]Partial-year production.
[c]No production in 1994 and 1995 due to mine closure.
[d]Fifteen (15) of these employees for 2006 were assigned to development effort.
[e]Fifty (50) employees were assigned to development and reported in that section's employment.
- - Not reported.

RECREATIONAL MINING

Recreational mining in Alaska continues to grow with the improved gold prices (fig. 40). Production numbers are not believed to be large and are very difficult to obtain; the identity of recreational miners is not sought from individuals and reporting is believed to be very inadequate. Reports are sought from the commercial ventures, but returns are meager. Production numbers from this sector of the industry are reported in the placer gold production in tables 13 and 14 and are estimated to amount to 1,133 ounces for the year compared to 307 ounces for 2005. Employment numbers reported in this report are educated guesses; they include commercial enterprise employees, miner time at the sites, and estimates of time involved by unorganized recreational miners in pursuit of the activity. The indicated full-time-equivalent jobs for 2006 were 45.

Some spectacular nuggets are found by the recreational miner because of the methods used. Historic bucket-line dredge activity on some of Alaska's streams used screens to separate the oversize material from the finer materials to enhance recovery. This sizing of materials resulted in discharge of large nuggets to the tailings piles left behind. Additionally, recovery of placer gold was not too efficient in the dredge recovery process; this has provided an exceptional opportunity for the recreational miner. Spoil piles have become the target of many of the recreational miners.

Steve Herschback, Alaska Mining and Diving, has provided an informative website to list recreational min-

ing opportunities: *www.akmining.com/mine/recsites.htm.* There are at least ten commercial ventures that provide recreational mining opportunities. The ventures provide the right to mine along with varying degrees of services and facilities depending on the need, which in turn is driven by the remoteness and access of the site. Charges for mining are moderate to high depending on the location and services provided. The website also lists other opportunities available to the recreational miner.

Figure 40. *Recreational miner (Francis, foreground) on Myers Fork with 1 ounce of hand-sluiced gold, July 2006. The two miners (Lynn and Jude) in the background are using a Highbanker to size feed and recover placer gold. Photo provided by Mike Busby, Geoquest and Chicken Gold Co.*

DRILLING

Drilling was conducted during all phases of mining (exploration, development, and production) on various projects across Alaska during the year. Tables 22–24 summarize drilling activity in the state during 2006 by region and type of drilling. Drilling totals for 2006 are 765,363 feet of core drilling, 54,173 feet of reverse-circulation drilling, 7,500 feet of reverse-circulation drilling on coal operations, and 8,759 feet of placer auger/churn drilling. More than half of the drilling footage for 2006 was from exploration projects in southwestern Alaska. The 2006 drilling footage increased 31 percent from the 2005 value, reflecting the substantial increase in exploration activity and expenditures.

Major drilling programs were conducted in most areas of the state. Barrick Gold had the largest drill program in Alaska with more than 302,000 feet of core drilling on the Donlin Creek property (fig. 41). The largest programs were in southwestern Alaska, with drilling by Barrick Gold Inc. on the Donlin Creek property, Northern Dynasty Minerals Ltd. at the Pebble property, TNR Gold Corp. at the Shotgun property, and Tonogold Resources Inc. in the Nyac area. Drilling programs in southeastern Alaska were conducted by Kennecott Minerals Co. with surface and underground drilling at Greens Creek Mine, Coeur Alaska Inc. at the Kensington and Jualin properties, and by Niblack Mining Corp. on the Niblack property. A major drilling program

Table 22. *Companies reporting significant drilling programs in Alaska, 2006*

Altar Resources	International Tower Hill Mines Ltd.	NovaGold Resources Inc.
Anglo American Exploration (USA) Inc.	Kennecott Exploration Co.	Pathfinder Mineral Services
Andover Ventures Inc.	Kennecott Minerals Co. & Hecla Mining Co.	Quaterra Resources Inc.
Barrick Gold Corp.	Kinross Gold Corp. (Fairbanks Gold Mining Inc.)	Silverado Gold Mines Ltd.
Brett Resources Inc.	Linux Gold Corp.	St. Andrew Goldfields Ltd. (Mystery Creek Resources Inc.)
Coeur Alaska Inc.	Little Squaw Mining Co.	Teck Cominco Alaska Inc.
Constantine Metal Resources Ltd.	Metallica Resources Inc.	TNR Gold Corp.
Full Metal Minerals Ltd.	Midas Resources Ltd.	Tonogold Resources Inc.
Geocom Resources Inc.	Niblack Mining Corp.	Triex Minerals Corp
Golconda Resources Ltd.	Northern Dynasty Minerals Ltd.	Usibelli Coal Mine Inc.
Hidefield Gold PLC		

was conducted in the eastern Interior region by Teck Pogo Inc. on the Pogo property in the Goodpaster mining district. Little Squaw Mining Co. conducted a large reverse-circulation drilling program on the Little Squaw property in the Chandalar area. Triex Minerals Corp. drilled the Boulder Creek uranium property on the Seward Peninsula. In south-central Alaska, major drilling programs were conducted by Full Metal Minerals Ltd. at the Lucky Shot property, by Kennecott Exploration Co. at the Whistler property, and by Anglo American on the MAN property. International Tower Hill Mines Ltd. drilled at several properties including the LMS and Terra projects. NovaGold Resources Inc. drilled at the Rock Creek, Big Hurrah, Khotol, and Arctic properties in the northern and western regions. St. Andrew Goldfields Ltd./Mystery Creek Resources Inc. continued underground drilling at the Nixon Fork property.

Table 23. *Drilling footage by region in Alaska, 2006*

Type of drilling	Northern	Western	Eastern Interior	South-central	South-western	South-eastern	Alaska Peninsula	TOTAL
Placer subtotal	**6,419**	**300**	**2,000**	**40**	- -	- -	- -	**8,759**
Coal subtotal	- -	- -	**7,500**	- -	- -	- -	- -	**7,500**
Hardrock core	9,876	54,596	79,832	61,975	402,785	154,196	2,103	765,363
Hardrock rotary	38,063	- -	13,610	2,500	- -	- -	- -	54,173
Hardrock subtotal	**47,939**	**54,596**	**93,442**	**64,475**	**402,785**	**154,196**	**2,103**	**819,536**
TOTAL (feet)	**54,358**	**54,896**	**102,942**	**64,515**	**402,785**	**154,196**	**2,103**	**835,795**

- - = Not reported.
Drill footages do not include sand and gravel drilling.

Table 24. *Drilling footage reported in Alaska, 1982–2006*

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	78,934	**455,524**
2000	15,480	- -	**15,480**	- -	**546,268**	418,630	127,638	**561,748**
2001	1,100	- -	**1,100**	**36,151**	**316,068**	240,318	75,750	**353,319**
2002	1,250	- -	**1,250**	- -	**488,902**	385,290	103,612	**490,152**
2003	10,108	- -	**10,108**	**2,000**	**370,634**	270,456	100,178	**382,742**
2004	107,526	- -	**107,526**	- -	**451,652**	415,628	36,024	**559,178**
2005	3,360	- -	**3,360**	- -	**634,277**	592,497	41,780	**637,637**
2006	8,759	- -	**8,759**	**7,500**	**819,536**	765,363	54,173	**835,795**

[a]Core and rotary drilling not differentiated prior to 1987.
- - = Not reported.

Figure 41. *Orienting a core drill rig into place on a drilling platform at the Donlin Creek gold property. Photo provided by Barrick Gold Corp.*

GOVERNMENT ACTIONS

Geologists from the Mineral Resources Section of the Alaska Division of Geological & Geophysical Surveys (DGGS) mapped and sampled 308 square miles of the Casadepaga River, Bear River, and Bluff areas of the southern Seward Peninsula (figs. 42 and 43). A 1:50,000-scale geologic map of the area will be available in spring 2008. This field work is part of an integrated program following the airborne geophysical survey results previously released by DGGS in 2003 and previous field work conducted in 2004 in the Council and Big Hurrah areas.

The State of Alaska, through DGGS, funded and acquired airborne magnetic and electromagnetic geophysical surveys for 613 square miles in a highly prospective area for base-metal and gold deposits in the Bonnifield mining district (table 25). In late January 2006, DGGS released the geophysical data and maps for four areas of Interior Alaska: Northeast Fairbanks, East Richardson, Liscum, and Black Mountain. The surveys were conducted by Fugro Airborne Surveys Corp. and managed by Stevens Exploration Management Corp. These data, all historic DGGS publications, and most U.S. Geological Survey publications on Alaska are available for free download at the DGGS Web site (http://www.dggs.dnr.state.ak.us).

To date, with an investment of $6.6 million, in excess of 6.5 million acres (more than 10,100 square miles) of Alaska have been flown for detailed geophysical surveys and about 2.7 million acres of 1:63,360- and 1:50,000-scale geologic maps have been produced as part of the

Figure 42. *Larry Freeman and David Szumigala sampling structurally-hosted mineralization at the Bluff prospect on Norton Sound as part of the DGGS geologic mapping program on the Seward Peninsula. Photo by Melanie Werdon.*

Figure 43. *Larry Freeman and Melanie Werdon sampling arsenopyrite-rich mineralization at a historic mine dump in the Daniels Creek area during geologic mapping and mineral investigations in the Casadepaga River–Bluff area. Photo by David Szumigala.*

State-funded Alaska Airborne Geophysical/Geological Mineral Inventory (AGGMI) Program (table 25). Federal monies from the U.S. Geological Survey's STATEMAP Program fund some of the geologic mapping within the AGGMI Program.

DGGS released airborne geophysical survey data for a 3,045-square-mile area along the Alaska Highway from Delta Junction to the Canada border that may include future development such as a natural gas pipeline, a railroad extension, or other infrastructure. The digital and paper copy release includes total field aeromagnetic and electromagnetic data. The electromagnetic data were acquired with a configuration designed to maximize information about near-surface materials such as sand and gravel resources, conductive overburden, and the location of potential geologic hazards such as permafrost and faults. The new data will be used to provide basic engineering, geologic, and resource planning information for future development in the area.

The DGGS Geologic Materials Center (GMC) received samples and data during the year, including geologic logs and assays from drill holes completed in 1981 and 1982 at the Coal Creek tin property in the Talkeetna Mountains Quadrangle.

DGGS requested input from the Alaska mineral industry for the formation of a voluntary sponsor group to help financially support DGGS's mineral-resource programs. This program would be modeled after the successful energy industry sponsorship program for DGGS's energy-related field studies and supporting analyses. Participating individuals and companies would be given the opportunity to meet with DGGS personnel in the field during project work

Table 25. *Detailed state airborne geophysical surveys and follow-up geologic ground-truth mapping as of December 2006*[a]

Nome District western core area	494 sq. miles	Airborne geophysical/ground-truth geological mapping
Nyac District core area	183 sq. miles	Airborne aeromagnetic mapping
Circle District core area	338 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Valdez Creek District	75 sq. miles	Airborne geophysical mapping
Fairbanks District	626 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Richardson District	137 sq. miles	Airborne geophysical mapping
Rampart/Manley-Tofty	1,026 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Upper Chulitna District	364 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Petersville-Collinsville District	415 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Iron Creek District	689 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Ruby District	591 sq. miles	Airborne geophysical mapping/ground-truth geologic map
Fortymile District	1,036 sq. miles	Airborne geophysical mapping/ground-truth geologic maps
Livengood District	229 sq. miles	Airborne geophysical mapping/ground-truth geologic maps
Salcha River/North Pogo	1,032 sq. miles	Airborne geophysical mapping/ground-truth geologic maps
Southeast extension of Salcha River–Pogo	91 sq. miles	Airborne geophysical mapping
Liberty Bell	276 sq. miles	Airborne geophysical mapping/ground-truth geologic mapping
Broad Pass	304 sq. miles	Airborne geophysical mapping
Council	618 sq. miles	Airborne geophysical mapping/ground-truth geologic mapping
Goodpaster	210 sq. miles	Airborne geophysical mapping
Liscum[b]	67 sq. miles	Airborne geophysical mapping (released winter 2006)
Black Mountain	222 sq. miles	Airborne geophysical mapping (released winter 2006)
East Richardson	224 sq. miles	Airborne geophysical mapping (released winter 2006)
Northeast Fairbanks	405 sq. miles	Airborne geophysical mapping (released winter 2006)
Alaska Highway Corridor[c]	3,046 sq. miles	Airborne geophysical mapping (released winter 2006)
Bonnifield District	613 sq. miles	Airborne geophysical mapping (released winter 2007)
Total: 14 years $8.5 million	**13,311 sq. miles**	**2.3% of Alaska's total area**

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

[b]Project funded through agreement with AngloGold Ashanti (USA) Exploration Inc.

[c]Project funded by the Alaska State Legislature as a $2 million Capital Improvement Project to assess the geologic hazards and resource potential along the proposed natural gas pipeline corridor.

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

to learn of the findings. Public input concerning the scope and nature of the program is encouraged.

Governor Sarah Palin appointed Marty Rutherford as the Department of Natural Resources' Acting Commissioner in November to replace the former administration's Commissioner Mike Menge. Governor Palin later appointed Tom Irwin as DNR Commissioner and Rutherford became the Deputy Commissioner in charge of gas pipeline negotiations.

DNR's abandoned mine land program completed a $3.5 million Phase II of the Jonesville Mine reclamation project. Coal fires burning down to 70 feet underground were extinguished, a clay cap was installed and a 26-acre parcel was landscaped. Cruz Construction Inc. conducted the work. The area will be fertilized and reseeded in 2007. Phase I of the program covered about 22 acres of adjacent land with underground coal fires. An adjacent active 40-acre coal lease held by Knoll Acres Associates LLC includes 10 acres of underground coal fires that are not included in the remediation program.

The federal coastal oversight agency, National Oceanic & Atmospheric Administration's Ocean & Coastal Resource Management (NOAA/OCRM) gave final approval to the state's revised coastal management plan on December 29, 2005. Management plans for nine of the 28 coastal districts were approved by NOAA/OCRM by the end of 2006. Six more coastal district plans were approved by February 7, 2007, with a timetable to approve all plans by September 1, 2007, which is the new date that existing plans will sunset.

On June 29, 2006, the State of Alaska formally applied to the U.S. Environmental Protection Agency (EPA) for authority to permit wastewater discharges in Alaska. Currently, EPA issues National Pollutant Discharge Elimination System (NPDES) permits, which are then certified by the Alaska Department of Environmental Conservation (DEC). The Clean Water Act establishes the NPDES wastewater permit program and encourages states to implement the program. The EPA provided an extensive list of comments on DEC's application on October 31, 2006, and met with DEC staff in mid November 2006 to discuss and clarify those comments. The EPA believes that there are several statutory shortcomings that must be corrected to demonstrate that DEC has the necessary authority to implement the NPDES program. DEC and EPA developed a work plan and process to address all EPA comments and to make necessary revisions to the NPDES application components. DEC plans to resubmit the NPDES application to EPA by June 15, 2007.

A geophysical survey funded by the U.S. Bureau of Land Management (BLM) for 1,450 square miles of mineral-rich lands in the southern National Petroleum Reserve–Alaska (NPR-A) was flown in 2005 and released by DGGS in early 2006 (table 26). The survey includes portions of the Howard Pass and Misheguk Mountain quadrangles and was carried out to assist the BLM in a resource assessment of the southern NPR-A. The southern NPR-A contains 22 documented mineral occurrences including the Drenchwater Creek sedex-type deposit, bedded barite occurrences, and bedded phosphate occurrences. The survey was conducted by Fugro Airborne Surveys Corp. and managed by Stevens Exploration Management Corp.

The U.S. Bureau of Land Management and DGGS are preparing to conduct aeromagnetic and electromagnetic surveys for federal lands in the Fortymile mining district of east-central Alaska. The survey is funded by BLM through a cooperative agreement with DGGS in support of DGGS's statewide airborne geophysical survey program. The survey will fill a critical gap between previously published DGGS geophysical surveys.

The U.S. Geological Survey (USGS) contracted for an aeromagnetic survey of the Dillingham Quadrangle and released the data in mid 2006. The USGS continued fieldwork in the Taylor Mountains Quadrangle of south-

Table 26. *Detailed federally funded airborne geophysical survey work as of December 2006*[a]

Wrangell/Stikine[b]		1,111 sq. miles	Airborne geophysical mapping
Koyukuk/Wiseman		533 sq. miles	Airborne geophysical mapping
Ketchikan[c]		605 sq. miles	Airborne geophysical mapping
Aniak		1,240 sq. miles	Airborne geophysical mapping
Delta River		603 sq. miles	Airborne geophysical mapping
Sleetmute		641 sq. miles	Airborne geophysical mapping
Howard Pass - Misheguk Mountain		1,447 sq. miles	Airborne geophysical mapping (released 2006)
Total:	**8 years** **$3.72 million**	**6,180 sq. miles**	**1.1% of Alaska's total area**

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

western Alaska, with geologic mapping conducted in the southeastern corner of the quadrangle and stream-sediment sampling concentrated in the western quarter of the quadrangle.

The BLM 2006 Hardrock Mineral Community Outreach and Economic Security Award was won by Coeur Alaska's Kensington Project. Mike and Lou Busby, doing business as GeoQuest and Chicken Gold Co. won the Small Operator Award. State reclamation awards for 2006 were awarded to Usibelli Coal Mine Inc., Golderado Mining Co., Nyac Mining Co., and EarthMovers of Fairbanks Inc. by the Alaska Department of Natural Resources (DNR) (fig. 44).

Dirk Kempthorne, Secretary of the U.S. Department of the Interior, announced the appointment of five members to the Alaska BLM Resource Advisory Council (RAC): Denise Michels, mayor of Nome, was appointed as a new member; reappointed members include Philip Driver, Midnight Sun Adventures; Suzanne McCarthy, Prince William Sound Community College; Teresa Imm, Arctic Slope Regional Corp.; and Keith Tryck, Tryck Consulting.

Mark Myers, former Director of DNR's Division of Oil & Gas, was confirmed as the Director of the U.S. Geological Survey in September 2006. The U.S. Geological Survey has 10,000 scientists, technicians, and support staff in nearly 400 offices in every state and several foreign countries.

The National Energy Technology Laboratory (NETL) released Phase 1 of the Beluga Coal Gasification report dealing with use of coal-based integrated gasification combined cycle (IGCC) plant to produce a feedstock for the Agrium fertilizer plant at Nikiski. Phase 2 of the study will assess a Fischer/Tropsch coal-to-liquids (CTL) plant at Usibelli Coal Mine's Emma Creek site that would utilize 4 million tons per year of coal to produce about 13,000 barrels per day of product.

The Alaska Energy Authority (AEA) dedicated a new geothermal power plant at Chena Hot Springs Resort on August 20, 2006. The Chena Hot Springs geothermal power plant is the only geothermal power plant built in the United States during 2006 and boasts the world's lowest-temperature geothermal resource ever trapped for power generation. Geothermal water at Chena Hot Springs never reaches its boiling point, so a traditional steam-driven turbine cannot be used. Instead, a secondary ("binary") fluid, R-134a, which has a lower boiling point than water, passes through a heat exchanger with 165°F water from the geothermal wells. Heat from the geothermal water causes the R-134a fluid to flash to vapor, which then drives the turbine. The Chena Hot Springs power plant generates power economically off a 120°F temperature differential between the evaporator and condenser temperature. The plant was developed through a partnership with United Technologies Corp. and the U.S. Department of Energy and partially funded by an Alaska Energy Authority Power Project Fund loan. All buildings at the resort are linked by a geothermal district-heating system and the geothermal power plant will alleviate the need for approximately 162,000 gallons of diesel fuel previously used for power. The cost of power production is expected to be reduced from $0.30 to less than $0.07 per kilowatt hour at Chena Hot Springs Resort by utilizing geothermal power. The payback period is expected to be 4–5 years. The geothermal power plant was awarded project of the year in the renewables category in an international competition sponsored by Power Engineering Magazine.

Figure 44. *June McAtee, Calista Corp., and Dr. Mike James, Nyac Mining Co., at the presentation of DNR's reclamation awards during the Alaska Miners Association annual convention. Calista recommended Nyac Mining Co. for the placer mining reclamation award. Photo provided by Calista Corp.*

Alaska's exports of seafood, minerals, fertilizer, and other products topped $4 billion in 2006, a 12 percent increase from 2005. Minerals such as zinc and lead totaled 29 percent of the exports, or $1.2 billion. Alaska exported products to 92 foreign destinations in 2006.

AIDEA was negotiating with Sherwood Copper Corp. for the use of the Skagway Ore Terminal to handle shipments of Sherwood's production from a proposed copper–gold mine near Minto in the Yukon Territory. R&M Consultants Inc. was hired by AIDEA to perform planning, design, and bid phase services. AIDEA had three bids for major construction work needed at the facility, with work to include construction of a new concentrate storage building and a new truck unloading facility, as well as installation of a new dust control system.

AIDEA and the U.S. Army Corps of Engineers (Corps) are investigating the feasibility of

Corps participation in dredging and maintenance of the DeLong Mountain Terminal Port in northwestern Alaska as a regional deep-water port. The Red Dog Mine is the main user of the current facilities. A direct load-out facility would allow users to reduce the environmental concern of the existing barge relay of concentrates, cut in half the current vessel loading time, reduce downtime caused by poor weather conditions, reduce operating costs, extend the shipping season into December, and improve the multi-purpose options of the terminal. The study's budget is $9 million and the costs of the current proposed improvements are approximately $230 million.

Governor Murkowski officially opened the new Glacier Creek Road near Nome on July 27, 2006. The 3.7 mile road is the first project in the Alaska Department of Transportation & Public Facilities' Roads to Resources Initiative. The road will allow access to the Rock Creek gold project from the Nome–Teller Highway without going up the old, twisting Anvil Creek road.

Anchorage Sand & Gravel Co. Inc. (AS&G) was awarded the 15th annual Made In Alaska Manufacturer of the Year Award. AS&G is one of the oldest companies in Alaska, getting their start along the banks of Ship Creek in Anchorage in 1938.

The State-owned Alaska Railroad made $10.4 million in profits during 2006 on total revenue of $148.9 million. The railroad hauled 7.67 million tons of freight in 2006. Revenue from shipping freight, the railroad's core business, was down 5 percent from the prior year, totaling $89.6 million. The railroad shipped 4 million tons of gravel in 2006. The Alaska Railroad Corp. is concluding $14 million of work on the Draft Environmental Impact Statement and preliminary engineering to extend the rail line from Fairbanks 85 miles southeast to Delta Junction to support growing commercial and military training potential.

The mineral industry paid a total of $172.3 million to the state of Alaska and Alaska municipalities in 2006 (table 27). These payments increased by more than $111 million above the $61.1 million collected in 2005. Mining license taxes increased by 425 percent from 2005 values, largely due to profitability of Red Dog Mine. Mining companies were the largest taxpayers in the City and Borough of Juneau and the Fairbanks North Star, Denali, and Northwest Arctic boroughs, with total payments of almost $12 million. Teck Pogo Inc. also paid the City of Delta Junction $500,000 as part of a payment in lieu of taxes (PILT) agreement in 2006. Teck Alaska Inc., operator of the Red Dog Mine, paid the Alaska Industrial Development & Export Authority annual user fees for use of the State-owned road and port, the DeLong Mountain Regional Transportation System. The AIDEA payment in FY06 was a minimum of $18 million. Teck Cominco Ltd. paid NANA Regional Corp. $51 million in FY06 as a net smelter royalty, a 300 percent increase over the FY05 payment of $16.95 million.

OUTLOOK

Exploration activity appears to remain as robust as or stronger than the 2006 activity. Exploration expenditures are projected to increase above the record 2006 value. The Pebble and Donlin Creek projects will account for a large portion of the expenditures, especially driven by Barrick striving to produce a bankable feasibility study for the Donlin Creek gold project by November 2007. Many exploration projects that have lain dormant for years are being explored again and reconnaissance-level exploration programs have outlined new prospects across Alaska.

Development expenditures for 2007 will be slightly lower than in 2006. Construction at Rock Creek and Big Hurrah will continue through most of 2007, if not for the full period. Pogo will experience some construction expenditures, but will assume full production status during 2007. Nixon Fork will report some construction expenditures for tailing filter installation and underground development, but is expected to achieve full production during 2007. Fort Knox stripping and Walter Creek heap leach construction will be ongoing throughout 2007 and their costs may exceed those of 2006. Donlin Creek may move to a development stage, but this is unknown at this time. Chuitna Coal development activity may increase if permits are received, but this is not expected; expenditures will probably be about the same as in 2006. Greens Creek development will continue at about the same level. Kensington construction will continue at about the same level and perhaps accelerate if the tailings disposal issue can be settled. Other smaller projects will be undertaken, but are not expected to influence results significantly.

Production quantities should improve slightly for 2007; the value of the production should increase once again due to firmer prices experienced during the year. The Pogo mine has reportedly achieved full production status and is forecasting production of 350,000 ounces during the year. Rock Creek/Big Hurrah may start production but is not expected to be a significant contributor for the year. The Nixon Fork mine should produce during 2007 but will not be to full capacity due to limited development and delays in processing the tailings reserve. The large producing mines, Red Dog, Fort Knox, Usibelli (coal), and Greens Creek, are expected to continue at about the same level. Commercial and recreational placer production will probably be about the same as in 2006. The rock, sand, and gravel production numbers will probably remain about the same level and no significant improvement in prices are expected. Metal prices have improved and should serve to further complement the value of production by a fairly significant amount. A 25 to 30 percent increase in value of production should be experienced.

Table 27. *Revenues paid to the State of Alaska and municipalities by Alaska's mineral industry, 2001–2006*

	2001	2002	2003	2004	2005	2006
State mineral rents and royalties[a]						
State claim rentals	$ 1,736,522	$ 1,908,228	$ 2,129,440	$ 2,657,939	$ 3,308,752	$ 3,460,803
Production royalties	1,933	23,447	270,734	162,637	124,338	171,220
Annual labor	103,274	124,741	224,519	226,191	332,439	155,007
Subtotal	**$ 1,841,729**	**$ 2,056,416**	**$ 2,624,693**	**$ 3,046,767**	**$ 3,765,529**	**$ 3,787,030**
State coal rents and royalties						
Rents	198,545	256,927	237,912	236,532	257,112	337,764
Royalties	1,168,043	860,633	1,064,208	1,239,257	1,476,250	1,473,948
Bonus	0	0	0	0	129,880	10
Offshore Prospecting Permits	0	0	0	0	0	0
Subtotal	**$ 1,366,588**	**$ 1,117,560**	**$ 1,302,120**	**$ 1,475,789**	**$ 1,863,242**	**$ 1,811,722**
State material Sales						
Mental Health	118,545	151,993	134,512	76,267	129,409	89,634
Division of Land	1,515,769	1,595,708	542,311	467,360	944,905	1,582,769
SPCO	12,894	24,725	208,309	112,047	46,877	118,904
Subtotal	**$ 1,647,208**	**$ 1,772,426**	**$ 885,132**	**$ 655,674**	**$ 1,121,191**	**$ 1,791,307**
State mining miscellaneous fees						
Filing fees	3,000	3,000	4,700	1,300	8,465	965
Penalty fees	0	450	0	26,110	20,280	46,249
Explore incentive app filing fee	0	0	0	0	0	0
Bond pool payment	53,866	45,208	44,878	35,426	32,331	36,721
Surface coal mining app fee	3,700	2,530	1,005	3,116	3,150	10,897
APMA mining fees	13,175	11,975	15,113	14,550	17,131	17,475
Subtotal	**$ 73,741**	**$ 63,163**	**$ 65,696**	**$ 80,502**	**$ 81,357**	**$ 112,307**
State corporate income tax[b]	50,266	(221,936)	406,064	2,104,144	23,641,883	71,299,684
Mining License Tax[c-f]	466,430	351,387	3,224,684	10,317,238	18,637,996	79,141,526
State Total	**$ 5,445,962**	**$ 5,139,016**	**$ 8,508,389**	**$ 17,680,114**	**$ 49,111,198**	**$157,943,576**
Payments to Municipalities	**$ 9,763,220**	**$ 9,703,208**	**$10,510,048**	**$10,999,663**	**$ 11,975,892**	**$ 14,388,329**
TOTAL	**$15,209,182**	**$14,842,224**	**$19,018,437**	**$28,679,777**	**$61,087,090**	**$172,331,905**

[a]Includes upland lease and offshore lease rentals.
[b]Preliminary data for 2006.
- only subchapter C corporations pay income tax.
- this report may not reflect 100% of the returns received in a year.
- data from 2001 through 2006 has been updated to reflect revenue to the state for the succeeding fiscal year; for example, FY07 receipts are shown in calendar year 2006.

In FY03 (calendar year 2002) more refunds were given than revenues received by the state.
[c]Includes metals, coal and material.
[d]Mining license tax has been adjusted to reflect actual receipts for the succeeding fiscal year for the period 2001 to 2006; see note for income tax above.
[e]Data does not match earlier reports.
[f]2006 numbers are preliminary and are subject to revision.

APPENDIX A
New claims staked in Alaska 2002-2006

Quad no.	Quadrangle name[a]	New federal mining claims					New state mining claims				
		2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
18	De Long Mountains	0	0	0	0	0	0	0	0	0	0
23	Phillip Smith Mountains	0	0	0	0	0	1	0	0	0	0
26	Noatak	0	0	0	0	0	0	0	0	0	0
27	Baird Mountains	0	0	0	0	0	8	0	60	20	260
28	Ambler River	0	0	0	0	0	0	0	0	313	15
29	Survey Pass	0	0	0	0	0	0	0	0	68	68
30	Wiseman	12	45	16	14	250	14	54	0	13	0
31	Chandalar	15	26	16	25	30	26	90	24	13	68
36	Selawik	0	0	0	0	0	0	0	0	0	0
37	Shungnak	0	0	0	0	0	0	0	0	0	0
38	Hughes	0	0	0	0	0	0	0	3	0	0
39	Bettles	3	15	0	12	7	0	0	0	0	0
43	Teller	0	0	0	0	0	60	2	0	36	80
44	Bendeleben	0	0	0	0	0	52	53	194	55	405
45	Candle	0	0	0	0	0	48	11	172	148	178
47	Melozitna	0	0	0	0	0	0	0	0	0	28
48	Tanana	0	1	0	0	0	43	32	53	45	46
49	Livengood	0	0	0	0	0	151	111	117	89	125
50	Circle	0	0	0	0	0	136	180	99	126	147
51	Charley River	0	0	0	0	0	0	0	0	0	2
52	Nome	0	0	0	0	0	13	13	9	7	57
53	Solomon	0	0	0	0	0	11	6	3	48	56
55	Nulato	0	0	0	0	0	0	40	0	69	0
56	Ruby	0	0	0	0	0	0	1	9	0	9
58	Fairbanks	0	0	0	0	0	49	114	102	70	96
59	Big Delta	0	0	0	0	0	110	478	631	988	2,218
60	Eagle	0	0	0	0	0	58	78	113	230	257
64	Ophir	0	0	0	0	0	40	14	42	1	0
65	Medfra	0	0	0	0	0	12	6	0	0	12
67	Healy	0	0	0	0	0	139	19	111	149	47
68	Mt. Hayes	36	21	24	253	0	175	471	156	84	429
69	Tanacross	0	0	0	0	0	0	20	33	0	34
73	Iditarod	0	0	0	0	0	28	13	213	1	589
74	McGrath	0	0	0	0	0	117	0	142	0	139
75	Talkeetna	0	0	0	0	0	81	171	166	178	383
76	Talkeetna Mountains	0	0	0	0	0	37	0	33	234	65
77	Gulkana	2	8	0	0	0	0	0	0	0	103
78	Nabesna	0	0	0	0	0	0	0	0	1	0
81	Russian Mission	0	0	0	0	0	5	0	0	0	160
82	Sleetmute	0	0	0	0	0	6	28	0	6	25
83	Lime Hills	0	0	0	0	0	0	5	32	271	122
84	Tyonek	0	0	0	0	0	0	57	597	113	125
85	Anchorage	0	0	0	0	0	48	104	75	80	72
86	Valdez	0	0	0	0	0	9	1	3	1	48
91	Bethel	0	0	0	0	0	0	0	0	8	154
92	Taylor Mountains	0	0	0	0	0	0	2	87	26	55
93	Lake Clark	0	0	0	0	0	2	501	267	866	87
95	Seward	17	21	10	18	13	14	6	18	7	12
96	Cordova	1	0	0	0	0	0	0	0	0	0
97	Bering Glacier	0	0	0	0	0	0	0	0	0	0
101	Goodnews Bay	0	0	0	0	0	0	0	12	0	0
102	Dillingham	0	0	0	0	0	0	34	5	147	0
103	Iliamna	0	0	0	0	0	36	720	944	318	26
104	Seldovia	0	0	0	0	0	0	0	3	0	0

Quad no.	Quadrangle name[a]	New federal mining claims 2002	2003	2004	2005	2006	New state mining claims 2002	2003	2004	2005	2006
109	Skagway	0	0	0	0	0	1	1	0	4	20
112	Juneau	33	68	0	0	1	6	6	6	2	7
114	Sitka	0	9	0	0	0	0	0	0	0	0
116	Port Alexander	0	0	0	0	0	0	0	0	0	0
117	Petersburg	141	39	0	1	54	0	3	0	0	0
118	Bradfield Canal	0	0	0	0	0	2	0	0	0	0
119	Craig	0	380	0	83	94	0	3	0	2	0
120	Ketchikan	0	0	0	0	0	2	0	2	0	0
121	Dixon Entrance	5	0	0	13	8	0	0	0	0	0
122	Prince Rupert	4	30	0	0	0	0	0	0	0	0
128	Bristol Bay	0	0	0	0	0	0	0	0	10	0
129	Ugashik	0	0	0	0	0	0	0	0	0	16
130	Karluk	0	0	0	0	0	18	0	18	0	0
131	Kodiak	0	0	0	0	0	0	0	0	1	0
133	Chignik	0	0	0	0	0	0	0	41	6	0
135	Trinity Islands	0	0	0	0	0	13	11	8	383	13
136	Kaguyak	0	0	0	0	0	0	0	0	71	0
	TOTALS	**261***	**663**	**66**	**419**	**457**	**1,571**	**3,459**	**4,603**	**5,308**	**6,858**

Source: Data provided by Alaska Department of Natural Resources Land Records Information Section and U.S. Bureau of Land Management.
[a]Unlisted quadrangles did not have any staked mining claims between 2001 and 2006.
*Eight federal claims extend over two quadrangles.

APPENDIX B
Prospecting sites in Alaska 2000–2006

Quad no.	Quadrangle name[a]	2000 New	2000 Total	2001 New	2001 Total	2002 New	2002 Total	2003 New	2003 Total	2004 New	2004 Total	2005 New	2005 Total	2006 New	2006 Total
18	De Long Mountains	72	99	0	99	0	91	0	91	0	91	0	91	0	91
26	Noatak	1	1	0	1	0	1	0	0	0	0	0	0	0	0
27	Baird Mountains	0	32	0	22	0	22	0	22	0	22	0	22	0	22
30	Wiseman	11	13	0	13	0	13	0	2	0	2	0	2	0	2
31	Chandalar	0	23	0	11	0	11	0	11	0	11	0	11	0	11
36	Selawik	0	7	0	7	0	7	0	7	0	7	0	7	0	7
38	Hughes	0	8	0	8	0	8	0	8	0	8	0	8	23	31
41	Fort Yukon	0	0	3	3	0	0	0	0	0	0	0	0	0	0
43	Teller	15	15	0	15	0	15	0	0	0	0	0	0	0	0
44	Bendeleben	0	49	0	38	0	31	0	31	0	31	0	31	0	31
45	Candle	32	46	0	38	0	32	0	0	0	0	0	0	0	0
47	Melozitna	0	144	0	128	0	0	0	0	0	0	0	0	0	0
48	Tanana	27	123	2	107	0	30	4	8	0	7	12	19	1	16
49	Livengood	24	123	0	35	7	14	7	21	0	21	3	24	0	17
50	Circle	32	301	5	137	9	91	1	68	0	67	3	70	3	72
52	Nome	37	110	1	95	0	74	0	38	0	38	0	38	0	38
53	Solomon	0	28	0	23	0	13	1	14	0	14	0	14	0	13
55	Nulato	6	32	0	30	0	16	0	2	0	2	0	2	0	2
56	Ruby	0	48	0	11	0	3	0	3	0	3	0	3	0	3
57	Kantishna River	0	4	0	4	0	4	0	4	0	4	0	4	0	4
58	Fairbanks	0	68	2	26	2	17	10	26	19	45	0	45	9	54
59	Big Delta	406	2,687	2	909	0	557	1	511	20	177	39	216	1	216
60	Eagle	76	312	0	134	1	108	0	32	5	37	1	38	0	38
64	Ophir	177	182	0	182	0	181	0	181	1	106	0	106	0	106
65	Medfra	0	3	0	1	0	1	2	3	0	3	0	3	0	1
67	Healy	13	93	0	48	0	26	0	26	8	34	0	34	8	42
68	Mt. Hayes	46	292	8	251	0	239	33	272	2	274	0	274	0	241
69	Tanacross	0	184	0	146	2	2	0	2	0	2	0	2	4	6
73	Iditarod	0	165	4	169	3	152	0	152	0	152	0	152	0	152
74	McGrath	52	65	0	65	0	57	0	5	2	7	0	7	0	7
75	Talkeetna	58	93	0	83	27	79	0	54	0	54	0	54	0	54
76	Talkeetna Mountains	4	81	0	50	4	52	38	86	2	88	66	154	26	164
77	Gulkana	3	3	0	3	0	3	0	3	0	3	0	3	0	3
78	Nabesna	4	4	0	4	0	4	0	4	0	4	0	4	0	4
81	Russian Mission	0	46	0	46	0	46	0	46	0	46	0	46	0	46
82	Sleetmute	0	26	0	26	0	26	0	26	0	26	0	26	0	26
84	Tyonek	0	0	0	0	0	0	4	4	0	4	0	4	0	0
85	Anchorage	3	64	0	60	1	56	0	53	0	53	4	57	0	57

APPENDIX B
Prospecting sites in Alaska 2000-2006

Quad no.	Quadrangle name[a]	2000 New	2000 Total	2001 New	2001 Total	2002 New	2002 Total	2003 New	2003 Total	2004 New	2004 Total	2005 New	2005 Total	2006 New	2006 Total
86	Valdez	25	41	0	41	0	41	0	26	0	26	0	26	0	26
91	Bethel	0	18	0	10	0	0	0	0	0	0	0	0	28	28
92	Taylor Mountains	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	Seward	0	2	0	2	0	0	0	0	0	0	0	0	0	0
97	Bering Glacier	0	2	0	0	0	0	0	0	0	0	0	0	0	0
102	Dillingham	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	Seldovia	1	1	0	1	0	1	0	1	0	1	0	1	0	1
105	Blying Sound	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	Skagway	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	Juneau	0	5	0	5	0	5	0	5	0	5	0	5	0	5
128	Trinity Islands	14	28	0	0	5	5	0	5	0	5	0	5	0	5
136	Craig	4	4	0	4	0	4	0	4	0	4	0	4	0	4
	TOTALS	**1,143**	**5,675**	**27**	**3,091**	**61**	**2,138**	**101**	**1,857**	**59**	**1,484**	**128**	**1,612**	**103**	**1,646**

[a]Unlisted quadrangles did not have any prospect sites staked during 2000–2006.
Source: Data provided by Alaska Department of Natural Resources Land Records Information Section.

APPENDIX C

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. C-1)." This says that the location of Lik is shown as number 1 in figure C-1.

Alaska-Juneau, 100, (fig. C-3).
Anderson Mountain, 54, (fig. C-1).
Aniak district, 84, (fig C-3).
Apex-El Nido, 104, (fig. C-3).
Apollo-Sitka mines, 86, (fig. C-3).
Arctic, 9, (fig. C-1).
Avan Hills, 12, (fig. C-3).
Baultoff, 75, (fig. C-2).
Bear Mountain, 21, (fig. C-2).
Big Creek/Ladue, 58, (fig. C-1).
Big Hurrah, 32, (fig. C-3).
Binocular and other prospects, 72, (fig. C-1).
Bohemia Basin, 103, (fig. C-3).
Bokan Mountain, 122, (fig. C-3).
Bonanza Creek, 45, (fig. C-2).
Bond Creek, 73, (fig. C-2).
Bonnifield district massive sulfide deposits, 54, (fig. C-1).
Bornite, 8, (fig. C-1).
Brady Glacier, 98, (fig. C-3).
BT, 54, (fig. C-1).
Buck Creek, 23, (fig. C-2).
Calder Mine, 133, (fig C-2).
Canwell and Nikolai Complex, 140 (fig. C-3)
Cape Creek, 22, (fig. C-2).
Carl Creek, 74, (fig. C-2).
Casca VABM, 53, (fig. C-1).
Castle Island, 111, (fig. C-1).
Chandalar mining district, 17, (fig. C-3).
Chichagof, 101, (fig. C-3).
Chistochina, 68, (figs. C-2, C-3).
Circle mining district, 52, (fig. C-3).
Claim Point, 82, (fig. C-3).
Coal Creek, 63, (fig. C-2).
Copper City, 119, (fig. C-1).
Cornwallis Peninsula, 110, (fig. C-1).
Council mining district, 33, (fig. C-3).
Delta massive sulfide belt, 55, (fig. C-1).
Denali prospect, 67, (fig. C-1).
Dolphin, 49e, (fig. C-3).
Donlin Creek, 137, (fig. C-3).
Drenchwater, 3, (fig. C-1).
Dry Creek, 54, (fig. C-1).
Duke Island, 141 (fig. C-3)
Eagle Creek, 34, (fig. C-3).
Ear Mountain, 25, (fig. C-2).
Ellamar, 78, (fig. C-1).
Ernie Lake (Ann Creek), 15, (fig. C-1).
Esotuk Glacier, 20, (fig. C-2).
Fairbanks mining district, 49, (fig. C-3).
Fairhaven/Inmachuk district, 39, (fig. C-3).
Fort Knox, 49a, (fig. C-3).
Fortymile mining district, 60, (fig. C-3).
Frost, 7a, (fig. C-1).
Funter Bay mining district, 99, (fig. C-3).
Galena Creek, 21a, (fig. C-1).
Gil Claims, 49f, (fig. C-3).
Ginny Creek, 4, (fig. C-1).
Golden Zone mine, 64, (figs. C-1, C-3).
Goodnews Bay, 85, (fig. C-3).
Grant Mine, 49c, (fig. C-3).
Greens Creek, 105, (fig. C-1).
Groundhog Basin, 112, (fig. C-1).
Haines Barite/Palmer, 95, (fig. C-1).
Hannum, 27, (fig. C-1).
Hirst Chichagof, 101, (fig. C-3).
Horsfeld, 76, (fig. C-2).
Hot Springs mining district, 47, (figs. C-2, C-3).
Hyder mining district, 117, (figs. C-1, C-2).
Iditarod district, 43, (fig. C-3).
Illinois Creek, 132, (figs. C-1, C-3).
Independence, 79, (fig. C-3).
Independence Creek, 28, (fig. C-1).
Inmachuk River, 39, (fig. C-3).
Innoko-Tolstoi mining district, 44, (fig. C-3).
Ivanof, 88, (fig. C-2).
Jimmy Lake, 94, (fig. C-1).
Johnson River, 125, (fig. C-3).
Jualin, 128, (fig. C-3).
Jumbo, 118, (fig. C-1).
Kaiyah, 138, (fig. C-3).
Kantishna mining district, 61, (fig. C-3).
Kasaan Peninsula, 114, (fig. C-1).
Kasna Creek, 92, (fig. C-1).
Kemuk Mountain, 123, (fig. C-3).
Kennecott deposits, 71, (fig. C-1).
Kensington, 127, (fig. C-3).
Kivliktort Mountain, 5a, (fig. C-1).
Klery Creek, 14, (fig. C-3).
Klukwan, 96, (fig. C-3).
Kougarok Mountain, 26, (fig. C-2).
Koyukuk-Hughes mining district, 42, (fig. C-3).
Koyukuk-Nolan mining district, 16, (fig. C-3).
Latouche, Beatson, 80, (fig. C-1).
Liberty Bell, 54, (fig. C-1).
Lik, 1, (fig. C-1).
Livengood-Tolovana mining district, 48, (fig. C-3).
Lost River, 24, (fig. C-2).
Lucky Shot, 79, (fig. C-3).
McLeod, 124, (fig. C-2).
Mertie Lode, 99, (fig. C-3).
Midas mine, 77, (fig. C-1).
Mike deposit, 90, (fig. C-2).
Mirror Harbor, 102, (fig. C-3).
Misheguk Mountain, 13, (fig. C-3).
Mosquito, Peternie, 56, (fig. C-2).
Mt. Prindle, 50, (fig. C-3).
Nabesna mine, 69, (fig. C-3).
Niblack, 121, (fig. C-1).
Nim prospect, 65, (fig. C-1).
Nimiuktuk River, 126, (fig. C-1).
Nixon Fork, 135, (fig. C-3).
Nome mining district, 30, (fig. C-3).
Nunatak, 97, (fig. C-2).
Omalik, 35, (fig. C-1).
Omar, 7, (fig. C-1).
Orange Hill, 73, (fig. C-2).
Pebble Copper, 129, (fig. C-1).
Placer River, 38, (fig. C-2).
Pleasant Creek, 53, (fig. C-1).
Pogo, 130, (fig. C-3).
Poovookpuk Mountain, 40, (fig. C-2).
Porcupine Lake, 18, (fig. C-2).
Purcell Mountain, 41, (fig. C-2).
Pyramid, 87, (fig. C-2).
Quartz Creek, 37, (fig. C-1).
Quartz Hill, 120, (fig. C-2).
Red Bluff Bay, 109, (fig. C-3).
Red Devil, 83, (fig. C-3).
Red Dog, 2, (fig. C-1).
Red Mountain, 82, (fig. C-3).
Rex deposit, 91, (fig. C-2).
Rock Creek, 31, (fig. C-3).
Rua Cove, 81, (fig. C-1).
Ruby mining district, 46, (fig. C-3).
Ryan Lode, 49b, (fig. C-3).
Salt Chuck, 115, (fig. C-3).
Sheep Creek, 54, (fig. C-1).
Shotgun Hills, 131, (fig. C-3).
Shulin Lake, 139 (fig. C-3)
Sinuk River region, 29, (fig. C-1).
Slate Creek, 59, (fig. C-3).
Sleitat Mountain, 93, (fig. C-2).
Smucker, 11, (fig. C-1).
Snettisham, 107, (fig. C-3).
Snipe Bay, 113, (fig. C-3).
Solomon mining district, 33, (fig. C-3).
Spirit Mountain, 70, (fig. C-3).
Stampede mine, 62, (fig. C-3).
Story Creek, 5, (fig. C-1).
Sumdum, 106, (fig. C-1).
Sun, 10, (fig. C-1).
Taurus, 57, (fig. C-2).
Three Castle Mountain, 53, (fig. C-1).
Tracy Arm, 108, (fig. C-1).
True North, 49d, (fig. C-3).
Twin Mountain, 51, (fig. C-2).
Union Bay, 116, (fig. C-3).
Valdez Creek district, 66, (fig. C-3).
Vinasale Mountain, 134, (fig. C-3).
Virginia Creek, 54, (fig. C-1).
Von Frank Mountain, 136, (fig. C-3).
War Baby, 79, (fig. C-3).
Weasel Mountain, Bee Creek, 89, (fig. C-2).
Whoopee Creek, 6, (fig. C-1).
Willow Creek, 79, (fig. C-3).
Wind River, 19, (fig. C-1).
Windy Creek, 36, (fig. C-2).
Zackly, 67a, (fig. C-1).

[a]This generalized summary does not describe all of the 7,000 known mineral occurrences 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.

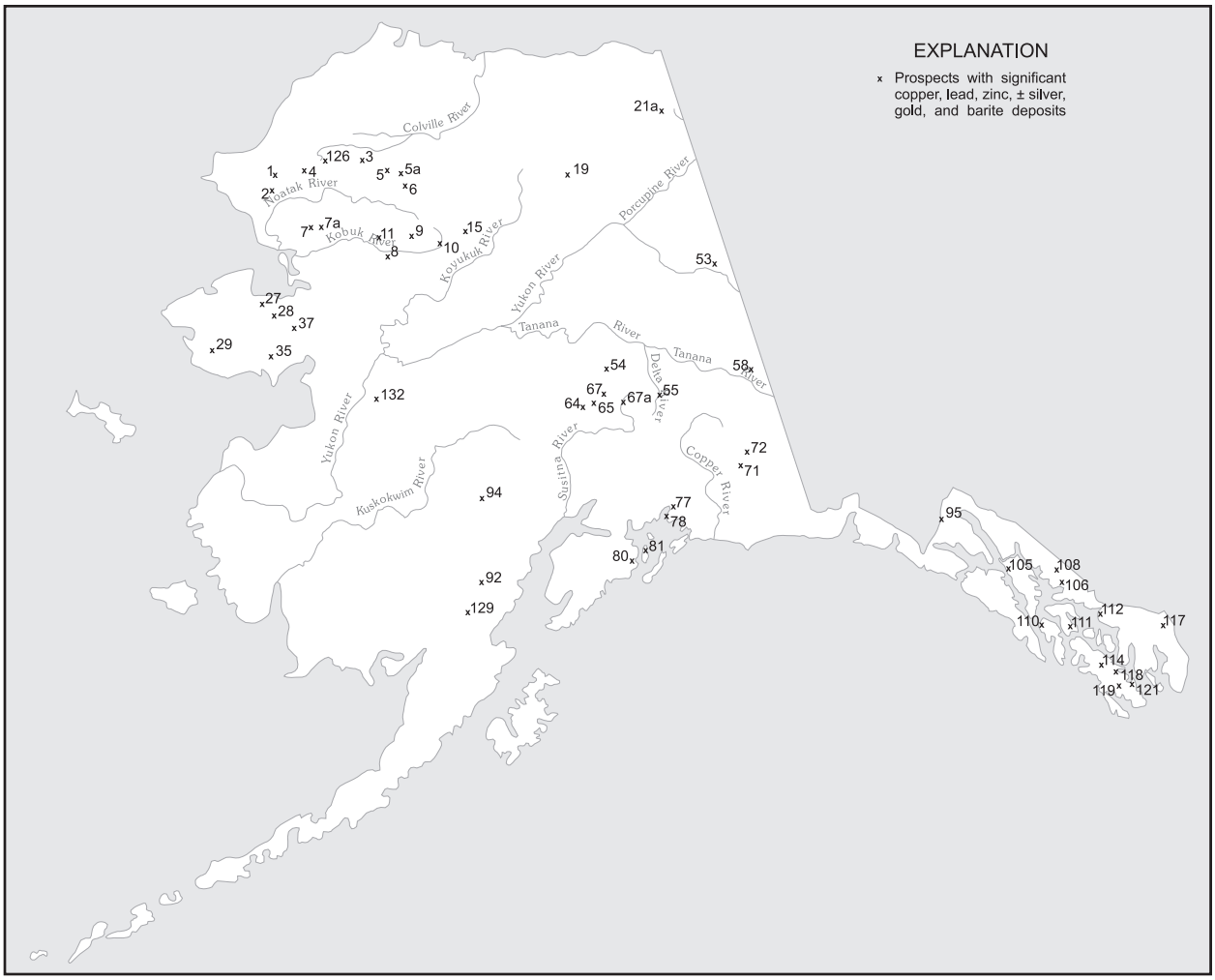


Figure C-1. *Significant copper, lead, zinc with credits of silver, gold, and barite deposits in Alaska, 2006.*

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. C-1).

2 **Red Dog**—At least five major stratabound massive sulfide deposits hosted in Pennsylvanian or Mississippian shale; similar to locality 1. Mining from 1989 to 2006 produced 7.7 million tons of Zn, 1.35 million tons of Pb, and 74.4 million oz Ag. Deposits, with announced reserves from 2000, include: (a) The Main deposit at Red Dog contains 46.2 million tons of proven ore grading 19.2% Zn, 5.2% Pb, with 2.92 oz/ton Ag. (b) The Aqqaluk deposit contains probable, indicated, and inferred reserves of 73.0 million tons grading 15.2% Zn, 4.03% Pb, and 2.17 oz/ton Ag. (c) The Qanaiyaq (formerly named Hilltop) deposit with an indicated reserve is 10.6 million tons grading 17.8% Zn, 5.5% Pb, and 3.41 oz/ton Ag. (d) Inferred resource in the Paalaaq deposit is 14.3 million tons of 15.0% Zn, 4.0% Pb, and 2.63 oz/ton Ag. (e) Anarraq deposit discovered in 1999 has an inferred reserve of 19.0 million tons of 15.8% Zn, 4.8% Pb, and 2.07 oz/ton Ag (fig. C-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. C-1).

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

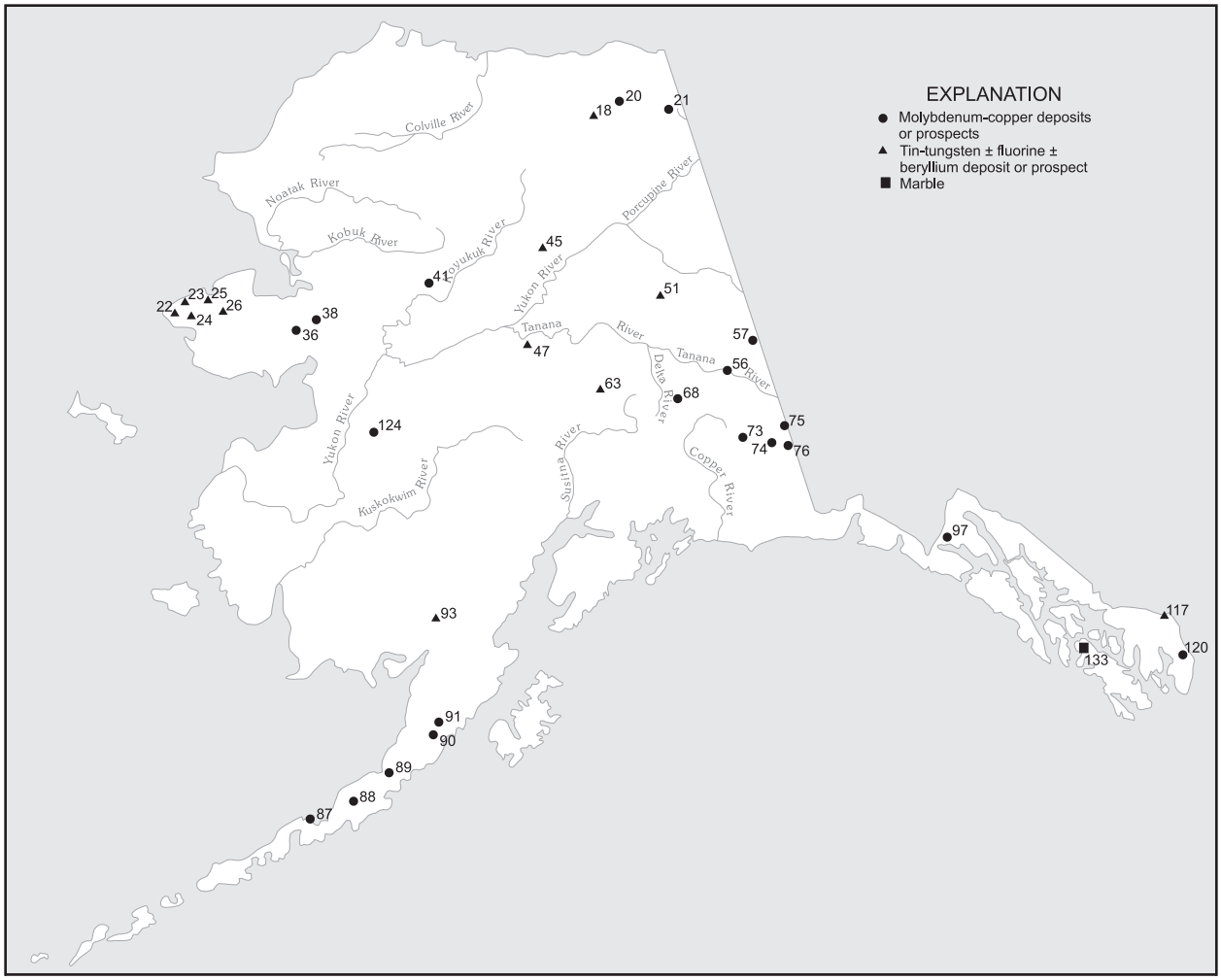


Figure C-2. *Significant molybdenum–copper and tin–tungsten with credits of fluorite and beryllium deposits in Alaska, 2006.*

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

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

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

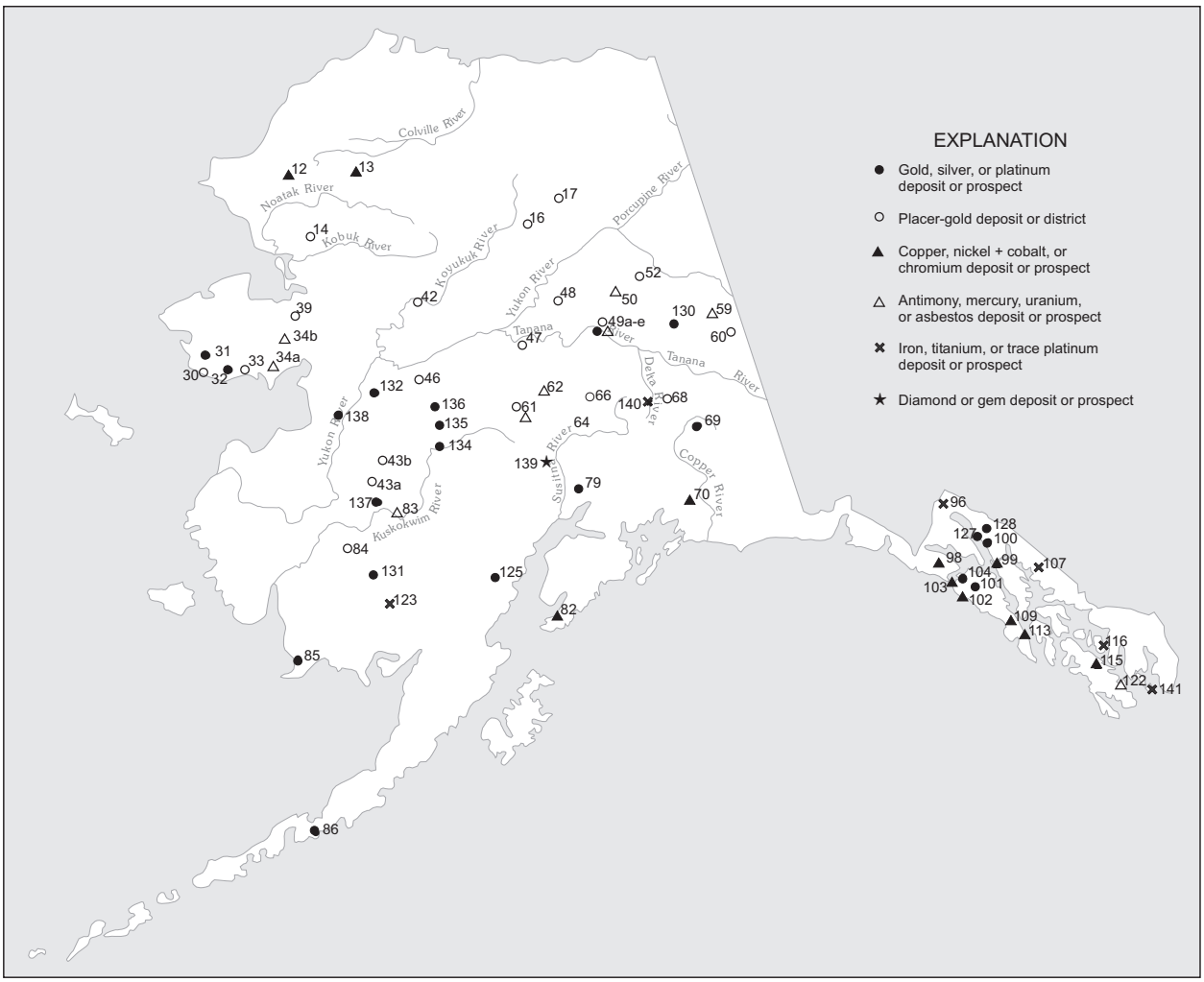


Figure C-3. *Significant gold, silver, platinum, and strategic mineral deposits in Alaska, 2006.*

13 **Misheguk Mountain**—Chromite occurrences similar to those in Avan Hills (fig. C-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. C-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. C-1).

16 **Koyukuk mining district**—Major placer Au district; from 1893 to 2006 produced an estimated 347,661 oz Au. Gold placers in Nolan Creek mined on surface and underground, both sources of large gold nuggets. Significant deep placer reserves remain (fig. C-3).

17 **Chandalar mining district**—Major Au-producing district; substantial production in excess of 66,287 oz Au through 2006 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. C-3).

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

19 **Wind River**—Stratabound Pb–Zn massive sulfide prospects; reported grades of up to 5% Pb (fig. C-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. C-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. C-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. C-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. C-2).

23 **Buck Creek**—Major placer Sn producer. More than 1,100 tons Sn produced from 1902 to 1953 (fig. C-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. C-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. C-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 was identified, with incrementally higher tonnage at lower grades (fig. C-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. C-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. C-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. C-1).

30 **Nome mining district**—Major placer Au producer. Production from 1897–2006 in excess of 4,998,886 oz Au, all from placers. Past Sb and W production (fig. C-3).

31 **Rock Creek**—550,000 oz Au resource, with about 11.79 million tons grading 0.059 oz/ton Au in vein swarms and stringers in an area 1,500 ft long, 500 ft maximum width and 300 ft deep (fig. C-3).

32 **Big Hurrah**—Epigenetic vein deposit in black slate and metasedimentary rocks of the Solomon 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. C-3).

33 **Solomon and Council mining districts**—Major placer Au districts; produced over 1,046,522 oz through 2006. 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. C-3).

34a **Eagle Creek**—U prospect in Cretaceous Kachauik alkalic intrusive rocks. Highly anomalous U concentrations up to 1,000 ppm reported (fig. C-3).

34b **Death Valley (Boulder Creek)**—Sandstone-type U prospect with predominantly epigenetic mineralization. Over 11,000 feet of drilling defined a minimum reserve of 1 million pounds of U_3O_8 with average grade of 0.27% U_3O_8 and 9.9 foot thickness within 200 feet of surface (fig. C-3).

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

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

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

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

39 **Fairhaven/Inmachuk district**—Placer deposits with 348,924 oz production from 1902–2006; significant reserves remaining in a large ancestral channel system. Large base metal sulfide concentrations and U values in concentrates (fig. C-3).

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

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

42 **Hughes mining district**—Production of 289,104 oz Au from 1930 to 2006, mainly from Alaska Gold Co. dredge at Hogatza; dredge reactivated in 1981, but deactivated in 1984, and reactivated again in 1990. Non-float mechanized operation on Utopia Creek produced significant amount of placer Au from 1930 to 1962 (fig. C-3).

43 **Iditarod district**—Major placer Au district; produced 1,563,459 oz Au through 2006. 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. C-3).

44 **Innoko–Tolstoi mining district**—Major placer Au district with significant lode Au–Sb–Hg potential; lode sources are Late Cretaceous volcanic-plutonic complexes and dike swarms that intrude Mesozoic flysch; mining district produced 732,353 oz Au through 2006, almost all from placer deposits (fig. C-3).

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

46 **Ruby mining district**—Placer Au–Sn district; produced more than 477,976 oz Au from 1931 to 2006; mining district also contains Pb–Ag prospects with grades reportedly as high as 82 oz/ton Ag (fig. C-3).

47 **Hot Springs mining district**—Placer Au–Sn district; produced more than 582,620 oz Au and over 720,000 lb cassiterite through 2006. Includes Eureka and Tofty subdistricts. Magnetite-rich, niobium-bearing carbonatite sill in the Tofty area contains geochemically anomalous Nb, REE, P, and Y (figs. C-2, C-3).

48 **Tolovana mining district**—Placer Au district; produced more than 529,573 oz Au since discovery in 1914 to 2006. Substantial reserves remain mainly on Livengood Bench, a Pliocene ancestral channel (fig. C-3).

49 **Fairbanks mining district**—Nationally ranked Au-producing district; largest producer in Alaska. Produced about 8,197,458 oz Au from placer deposits (1902–2006). Major lode Au and lode Sb producer; produced more than 4,094,196 oz Au and over 2000 tons Sb from veins and shear zones through 2006. Production of W exceeded 4,000 short ton units since 1915, all derived from skarn near Cretaceous quartz monzonite (fig. C-3).

49a **Fort Knox**—Disseminated Au deposit within granodiorite/quartz monzonite pluton near Fairbanks. Proven and probable reserves as of December 31, 2006, open at depth, are 2,705,000 oz of Au in 176.0 million tons of rock at an average Au grade of 0.015 oz/ton. Measured and indicated resources are 70.69 million tons grading 0.018 oz/ton Au containing 1,289,000 ounces of gold, with 1,573,000 ounces of measured and indicated gold resources in the Fort Knox area. Fairbanks Gold Mining Inc. at Fort Knox and True North mines produced 3,676,284 oz of Au from 1996 to 2006 (fig. C-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. C-3).

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

49d **True North**—Au occurs in siderite-quartz veins in carbonaceous quartzite and schist within a terrane containing eclogitic rocks. An indicated resource of 188,000 oz Au at grade of 0.040 oz/ton Au in 4,665,000 tons of rock as of December 31, 2006. 11.04 million tons of 0.04 oz/ton ore were processed at Fort Knox mill from 2001 through 2004 (fig. C-3).

49e **Dolphin—**Mineralized intermediate intrusion contains anomalous Au, As, Bi and Sb. Discovery hole in 1995 intercepted 330 ft of 0.049 oz/ton Au (fig. C-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 identified an in-place Au resource of 433,000 oz at an average grade of 0.04 oz/ton Au (fig. C-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. C-3).

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

52 **Circle mining district**—Currently one of Alaska's largest producing placer Au districts; produced more than 1,068,860 oz Au since discovery in 1893 to 2006. Has significant potential for Sn, W, and Au mineralization from variety of lode sources (fig. C-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. C-1).

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

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

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

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

60 **Fortymile mining district**—Major placer Au district. Produced over 561,646 oz placer and very minor lode Au since discovery in 1883 to 2006, the longest continuous production of Au (120 years) of any Alaskan mining district (fig. C-3).

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

62 **Stampede mine**—Major Sb deposit; produced more than 1,750 tons Sb from large shear zone in poly-metamorphic rocks of Yukon–Tanana terrane (fig. C-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. C-2).

64 **Golden Zone mine**—Major Au–Cu–Ag deposits in Late Cretaceous breccia pipe and skarn deposits. Produced more than 1,581 oz Au, 8,617 oz Ag, and 21 tons Cu. The Golden Zone deposit contains measured and indicated resources of approximately 2 million tons, grading 0.106 oz/ton Au, 0.47 oz/ton Ag and 0.12 % Cu (utilizing a 0.05 oz/ton Au cut-off grade), and contains approximately 214,800 ounces of gold, 948,000 ounces of silver and 24,000 pounds of copper. (figs. C-1, C-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. C-1).

66 **Valdez Creek district**—About 513,671 oz Au production through 2006. Cambior Alaska Inc., the largest placer mine in Alaska, operated in this district until September 1995 (fig. C-3).

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

67a **Zackly**—Disseminated Cu and Au in 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. C-1).

68 **Chistochina**—Porphyry Cu prospects of Tertiary age and placer Au district; produced more than 182,719 oz Au and small amount Pt from placer deposits through 2006 (figs. C-2, C-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. C-3).

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

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

72 **Binocular and other prospects**—Kennecott-type Cu–Ag massive sulfide deposits (fig. C-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. C-2).

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

76 **Horsfeld**—Porphyry Cu prospect of Late Cretaceous age (fig. C-2).

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

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

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

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

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

84 **Aniak district**—Significant placer Au district with 595,366 oz Au produced through 2006, mainly from the Nyac and Donlin Creek areas (fig. C-3).

85 **Goodnews Bay**—Major placer Pt district; estimated to have produced over 555,000 oz refined PGE metals from 1934 to 1976; one of the largest known PGE metal resources in United States. Possible resources of 60 million yd^3 of deep, PGE-bearing gravels remain. Lode source believed to be Alaskan-type zoned ultramafic complex of Jurassic or Cretaceous age. Possible significant offshore placer potential (fig. C-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. C-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. C-2).

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

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

91 **Rex deposit**—Porphyry Cu prospect similar to locality 90; grades up to 0.3% Cu. Potential for moderate reserves of low-grade mineralization (fig. C-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. C-1).

93 **Sleitat Mountain**—High-grade east-west-trending, Sn–W–Ag topaz–quartz greisen system hosted in 59-million-year-old granite and in hornfels. Zone up to 3,000 ft long and 500 ft wide. One drill-hole with 85 ft of 1.8% Sn, and 0.4% W. Inferred resources up to 106,000 tons Sn in 29 million tons ore (fig. C-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. C-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. C-1).

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

97 **Nunatak**—Porphyry Mo deposit; reported reserves of 2.24 million tons ore grading 0.067% Mo, 0.16% Cu, and 129.5 million tons of 0.026% Mo, 0.18% Cu (fig. C-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. C-3).

99 **Mertie Lode and Funter Bay**—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. C-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 (fig. C-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. C-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. C-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. C-3).

104 **Apex–El Nido**—Significant lode Au–W deposits occurring as cross-cutting veins in graywacke; produced more than 50,000 oz Au (fig. C-3).

105 **Greens Creek—**Major sediment-hosted Pb–Zn–Cu–Ag–Au volcanogenic massive sulfide deposit of Devonian or Triassic age. Production from 1989 to 1993 and 1996 to 2006 is 989,769 tons of Zn, 302,493 tons of Pb, over 8,600 tons of Cu, 135.4 million oz of Ag, and 982,216 oz of Au. 2006 probable reserve estimate is 7.68 million tons grading 10.39% Zn, 3.98% Pb, 14.42 oz/ton Ag, and 0.113 oz/ton Au. Inferred resources are 5.07 million tons grading 10.4% Zn, 4.0% Pb, 0.113 oz/ton Au, and 14.42 oz/ton Ag. (fig. C-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. C-1).

107 **Snettisham**—Fe–Ti deposit in mafic zoned intrusive complex; reported grades of about 18.9% Fe and 2.6% Ti (fig. C-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. C-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. C-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. C-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. C-1).

112 **Groundhog Basin**—Area with several massive sulfide prospects in Mesozoic schist and gneiss whose origins are possibly 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. C-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. C-3).

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

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

116 **Union Bay**—Significant Fe–Ti-(V) mineralization in zoned, Ural-Alaska type ultramafic complex At least 7 zones of PGE–magnetite hydrothermal mineralization associated with pyroxene veins that crosscut magmatic layering (fig. C-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 contains potential for porphyry Mo–W mineralization and massive sulfide–skarn Pb–Ag–Au–W deposits (figs. C-1, C-2).

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

119 **Copper City**—Stratiform Cu–Zn–Ag–Au massive sulfide deposit 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. C-1).

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

121 **Niblack**—Volcanogenic Cu–Pb–Au–Ag massive sulfide deposit hosted in Precambrian(?) Wales Group or Ordovician to Silurian Descon Formation; produced more than 700 tons Cu, 11,000 oz Au, and 15,000 oz Ag. Resource of 2.78 million tons at 3.22% Zn, 1.70% Cu, 0.93 oz/ton Ag and 0.081 oz/ton Au. (fig. C-1).

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

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

125 **Johnson River**—Epigenetic(?) quartz-sulfide stockwork or massive sulfide deposit hosted in volcaniclastic, pyroclastic, and volcanic rocks of Jurassic Talkeetna Formation. Deposit has drilled-out reserves at a $45/ton cutoff with no cut of high Au assays, 1,099,580 tons grading 0.32 oz/ton Au, 0.24 oz/ton Ag, 0.76% Cu, 1.17% Pb, and 8.37% Zn (fig. C-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. C-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 estimates indicate at least 4.42 million tons grading 0.31 oz/ton Au for 1,352,140 oz Au of proven and probable reserves and 4.32 million tons of mineralized material grading 0.20 oz/ton Au (fig. C-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 included in the reserves of the Kensington property (fig. C-3).

129 **Pebble (Copper)**—One of the world's largest Cu–Au porphyry deposits with several known centers. The Pebble West deposit has a measured, indicated and inferred resource of 2.04 billion tons grading 0.34% Cu, 0.011 oz/ton Au and 0.018 % Mo at a 0.50% Cu equivalent cutoff. The new Pebble East deposit has an inferred resource of 3.75 billion tons grading 0.57% Cu, 0.011 oz/ton Au and 0.036 % Mo at a 0.60% Cu equivalent cutoff. The 2007 combined resource contains 67 billion pounds of copper, 82 million ounces of gold and 5.2 billion pounds of molybdenum. Mineralized system extends over 35 square mile area and includes other Cu–Au–Mo porphyry, Cu–Au skarn, and Au vein prospects (fig. C-1).

130 **Pogo**—Au hosted in at least three 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 mining reserve for the Liese L1 and L2 zones is 7.7 million tons at an average grade of 0.47 oz/ton, for a total of 3.63 million oz at a 0.1 oz/ton cut-off grade. Produced 113,364 ounces of gold in 2006. Other high-grade Au targets have been identified along an 8-mi-long trend southeast of the Liese zones (fig. C-3).

131 **Shotgun**—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. C-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 averaged 148 ft wide, with a drill-defined east-west strike length of 11,600 ft. Produced approximately 143,860 oz Au and 755,600 oz Ag from 1997 to 2004. Past ore grade of 0.076 oz/ton Au and 1.6 oz/ton Ag (figs. C-1, C-3).

133 **Calder Mine**—Seven recrystallized carbonate units exposed at the apex of a large regional antiform. Drilling has identified 13 million tons of chemically homogenous,

high-brightness, high-whiteness marble with a purity of 98 to 99% calcium carbonate. Potential resource of 80 million tons of high-value calcium carbonate (fig. C-2).

134 **Vinasale Mountain**—Intrusion-hosted Au deposit. Au occurs as disseminated and veinlet mineralization, 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. Inferred resource of 14.35 million tons grading 0.067 oz/ton Au, with an 0.03 oz/ton cut-off grade was for the Central zone (fig. C-3).

135 **Nixon Fork**—Au–Cu skarn deposits; Historic Nixon Fork mine produced 59,500 oz Au from Late Cretaceous skarns associated with quartz monzonite-Devonian limestone contact zones. Underground mining resumed in October 1995, with 137,748 oz of Au, 1,050 tons of Cu, and significant Ag produced through mine closure in 1999. 2006 ore resources and reserves are 25,787 tons grading 1.07 oz/ton Au (measured), 138,852 tons grading 0.63 oz/ton (indicated), and 102,486 tons grading 0.45 oz/ton (inferred), with proven reserves of 51,800 tons grading 0.993 oz/ton Au and probable reserves of 151,600 tons grading 0.54 oz/ton Au, for a total of 295,430 ounces of gold (fig. C-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 up to 429 ft wide with an average grade of 0.013 oz/ton Au. Higher-grade intercepts include 0.035 oz/ton Au up to 135 ft (fig. C-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, refractory, and occurs along a 4–mile long, 1–mile wide zone. 2006 measured and indicated resource estimated at 16.6 million oz of Au grading 0.070 oz/ton Au and an inferred resource of 17.1 million oz Au grading 0.068 oz/ton Au at a 0.022 oz/ton Au cut-off grade. Considered the 25th largest gold resource in the world (fig. C-3).

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

139 **Shulin Lake**—Micro-and macro-diamonds occur in interbedded volcaniclastic and tuffaceous rocks containing olivine and pyroxene. Discovered by tracing diamond indicator minerals in placer gravels. Possibly lamproitic intrusions with up to 1-mile diameter circular aeromagnetic anomalies (fig. C-3).

140 **Canwell and Nikolai Complex**—Ni–Cu–PGE semi-massive to massive sulfide prospects hosted in mafic and ultramafic rocks of the Nikolai intrusive/extrusive complex. Five mafic-ultramafic intrusions in the central Alaska Range are comagmatic with the Nikolai flood basalts (fig. C-3).

141 **Duke Island**—Cu–Ni–PGE disseminated, semi-massive, and massive sulfides associated with 2 zoned, Ural-Alaska type ultramafic bodies (fig. C-3).

APPENDIX D

State and federal agencies and private interest groups involved in mineral development activities, 2006

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

STATE OF ALASKA AGENCIES

OFFICE OF THE GOVERNOR
Office of International Trade
550 West 7th Ave., Ste. 1700
Anchorage, AK 99501
(907) 269-7450
(907) 269-7461 (fax)
email: Kris_Perry@alaska.gov

Function: Primary state office for promotion of exports. Maintains overseas offices to increase Alaska's visibility in key markets.

DEPARTMENT OF COMMERCE, COMMUNITY & ECONOMIC DEVELOPMENT
State Office Building, 9th Fl.
P.O. Box 110801
Juneau, AK 99811-0801
http://www.commerce.state.ak.us
(907) 465-2500
(907) 465-5442 (fax)

Function: Promotes economic development in Alaska.

Office of Economic Development
550 W. 7th Ave., Ste. 1770
Anchorage, AK 99501
(907) 269-8112
(907) 269-8125 (fax)

Office of Mineral Development
211 Cushman St.
Fairbanks, AK 99701-4639
(907) 451-2738
(907) 451-2742(fax)
email: rich.hughes@alaska.gov
http://www.commerce.state.ak.us/oed/minerals/mining.htm

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. In cooperation with the Office of International Trade, OED also encourages the development of new markets for Alaska resources, increases the visibility of Alaska and its products in the international marketplace, and makes referrals and provides technical assistance to those interested in developing export markets for Alaska-produced or value-added goods and services.

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

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

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
PO Box 111800
Juneau, AK 99811-1800
(907) 465-5070 (fax)
(907) 465-5065 Commissioner's Office
http://www.dec.state.ak.us

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.

Department of Environmental Conservation
Anchorage Office
555 Cordova St.
Anchorage, AK 99501-2617
(907) 269-7500
(907) 269-7600 (fax)
1-800-510-2332 (inside Alaska only)
http://www.dec.state.ak.us

Department of Environmental Conservation
Fairbanks Office
610 University Ave.
Fairbanks, AK 99709-3643
(907) 451-2100
(907) 451-5120 (fax)
(907) 451-2184 TTY
http://www.dec.state.ak.us

DEPARTMENT OF FISH AND GAME
P.O. Box 115526
Juneau, AK 99811-5526
(907) 465-4100
(907) 465-2332
http://www.state.ak.us/adfg

DEPARTMENT OF NATURAL RESOURCES
Office of the Commissioner
400 Willoughby Ave., Ste. 500
Juneau, AK 99801-1724
(907) 465-2400
http://www.dnr.state.ak.us

Alaska Coastal Management Program
302 Gold St., Ste. 202
Juneau, AK 99801
(907) 465-3562
(907) 465-3075 (fax)

Function: Conducts coordinated State review of permits for mining projects within Alaska's Coastal Management Zone. Provides proj-

ect 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 Ave., Ste. 1660
Anchorage, AK 99501-3568
(907) 269-7470
(907) 269-3981 (fax)

Alaska Mental Health Trust Land Office
718 L St., Ste. 202
Anchorage, AK 99501
(907) 269-8658
(907) 269-8905 (fax)
http://www.mhtrustland.org

Function: The Trust Land Office (TLO) manages the approximately 1 million acres of land that are included in the Alaska Mental Health Land Trust, which was created by Congress in 1956. Lands in the Trust are located throughout the state and are used to generate revenues to meet the expenses of mental health programs in Alaska. Management activities include all aspects of land use and resource development, including mineral and oil and gas leasing, exploration, and development; material sales (including gravel, sand, and rock); timber sales; surface leasing; land sales; and issuance of easements across Trust land.

Office of Habitat Management & Permitting
Headquarters & Juneau Area Office
PO Box 111050
Juneau, AK 99811-1050
(907) 465-4105
(907) 465-4759(fax)

Function: The Office of Habitat Management and Permitting fulfills specific statutory responsibilities for (1) protecting freshwater and anadromous fish habitat under the Anadromous Fish Act (AS 41.14.870) and (2) providing free passage of anadromous and resident fish in fresh waterbodies (AS 41.14.840). It requires prior written authorizations for any work affecting the free movement of fish, for any use or activity that may affect designated anadromous fish waters, and for any disturbance-producing or habitat-altering activity.

Operations Manager & Fairbanks Area Office
1300 College Rd.
Fairbanks, AK 99701-1551
(907) 459-7289
(907) 459-7303 (fax)

Anchorage Area Office
550 W. 7th Ave., Ste. 1420
Anchorage, AK 99501
(907) 269-8690
(907) 269-5673 (fax)

Kenai Area Office
514 Funny River Rd.
Soldotna, AK 99669-8255
(907) 260-4882 ext. 222
(907) 260-5992 (fax)
http://www.dnr.state.ak.us/habitat

Mat-Su Area Office
1800 Glenn Highway, Ste. 12
Palmer, AK 99645-6736
(907) 761-3855
(907) 745-7369 (fax)

Petersburg Area Office
P.O. Box 667
Petersburg, AK 99833-0667
(907) 772-5224
(907) 772-9336 (fax)

Prince of Wales Area Office
P.O. Box 668
Craig, AK 99921-0668
(907) 826-2560
(907) 826-2562 (fax)

Division of Forestry
550 W. 7th Ave., Ste. 1450
Anchorage, AK 99501-3566
(907) 269-8463
http://www.dnr.state.ak.us/forestry

Function: Establishes guidelines to manage mining in state forests.

Northern Region Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2660

Coastal Region Office
101 Airport Rd.
Palmer, AK 99645
(907) 761-6200

Division of Geological & Geophysical Surveys
3354 College Rd.
Fairbanks, AK 99709-3707
(907) 451-5010
(907) 451-5050 (fax)
email: dggs@dnr.state.ak.us
http://wwwdggs.dnr.state.ak.us

Function: Conducts geological and geophysical surveys to determine the potential of Alaska land for production of metal, mineral, fuel, and energy 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 (from AS 41.08.020). Publishes a variety of reports and maintains a web site 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 Center storage facility at Eagle River.

Geologic Materials Center
P.O. Box 772805
Eagle River, AK 99577-2805
(907) 696-0079
(907) 696-0078 (fax)
John_Reeder@dnr.state.ak.us

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/mlw

A. Mining

Function: Principal agency for management of mining and reclamation on state land in Alaska. Maintains offices in Anchorage and Fairbanks. Issues property rights to leasable minerals; manages locatable mineral filings. Also issues millsite leases and 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, 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-rights permits and certificates; responsible for safety of all dams in Alaska.

Mining Information:
Anchorage (907) 269-8642
Fairbanks (907) 451-2793

All other Land & Water Information:
Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2740
(907) 451-2751 (fax)

Southcentral Regional Office
550 W. 7th Ave., Ste. 900C
Anchorage, AK 99501
(907) 269-8503
(907) 269-8913 (fax)

Southeast Regional Office
400 Willoughby Ave., Ste. 400
Juneau, AK 99801-1724
(907) 465-3400
(907) 586-2954 (fax)
E-mail: sero@dnr.state.ak.us

Division of Parks and Outdoor Recreation
550 W. 7th Ave., Ste. 1310
Anchorage, AK 99501-3565
(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

Southeast Area Office
400 Willoughby Ave., 5th Fl.
P.O. Box 111071
Juneau, AK 99811-1071
(907) 465-4563
(907 586-3113 (fax)

Office of History and Archaeology
550 W. 7th Ave., Ste. 1310
Anchorage, AK 99501-3565
(907) 269-8721
(907) 269-8908 (fax)
email: stefaniel@dnr.state.ak.us
http://www/parks/oha

DEPARTMENT OF PUBLIC SAFETY
P.O. Box 111200
Juneau, AK 99811-1200
(907) 465-4322
http://www.dps.state.ak.us

Alaska Bureau of Wildlife Enforcement
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
550 W 7th Ave., Ste. 500
Anchorage, AK 99501-3555
(907) 269-6620
(907) 269-6444 (fax)
email: dor.tax.mining@alaska.gov
http://www.tax.alaska.gov/

Function: Issues licenses for sand and gravel operations. 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 Natural Science and Mathematics
Department of Geology & Geophysics
P.O. Box 755780
Natural Sciences Building, Room 308
University of Alaska Fairbanks
Fairbanks, AK 99775-5780
(907) 474-7565
(907) 474-5163 (fax)
email: geology@.uaf.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. For undergraduate studies, the department offers a B.A. program in Earth Science and a B.S. program in Geology (with emphasis options in general geology, economic geology, and petroleum geology). For graduate studies, the department offers M.S. and Ph.D. programs in Geology and Geophysics, with concentrations in: General geology; economic geology; petroleum geology; Quaternary geology; remote sensing; volcanology; solid-earth geophysics; and snow, ice, and permafrost geophysics.

College of Engineering and Mines
P.O. Box 755960
Duckering Building, Room 357
University of Alaska Fairbanks
Fairbanks, AK 99775-5960
(907) 474-7730
(907) 474-6994 (fax)
email: fycem@uaf.edu
http://www.uaf.edu/cem

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

Mineral Industry Research Laboratory (MIRL)
College of Engineering and Mines
P.O. Box 757240
Duckering Building, Room 403
University of Alaska Fairbanks
Fairbanks, AK 99775-7240
(907) 474-6746
(907) 474-5400 (fax)
email: ffdew1@uaf.edu

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.

Dept. of Mining and Geological Engineering
College of Engineering and Mines
P.O. Box 755800
Duckering Building, Room 301
University of Alaska Fairbanks
Fairbanks, AK 99775-5800
(907) 474-7388
(907) 474-6635 (fax)
email: fyminge@uaf.edu
http://www.uaf.edu/cem

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

Mining and Petroleum Training Service
P.O. Box 3050
University of Alaska Anchorage
Kenai Peninsula College
Soldotna, AK 99669
(907) 262-2788
(907) 262-0288 (fax)
email: mapts@alaska.net
http://mapts.uaa.alaska.edu

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, and industrial hygiene. 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 more than 200 million acres of public land in Alaska.

U.S. Bureau of Land Management
Alaska State Office
Division of Lands, Minerals, and Resources
222 West 7th Ave., Ste. 13
Anchorage, AK 99513-7599

Public Information Center (907) 271-5960
Northern Field Office (907) 474-2252
Public Information Center
http://www.ak.blm.gov/

Energy Branch (907) 271-5608
Solid Minerals Branch (907) 271-5608

Division Functions:
BLM is the surface manager of federal public lands (except national parks, wildlife refuges, national monuments, national forests, and military withdrawals). The Division is responsible for developing and coordinating statewide and regional program management policies and strategies related to federal onshore energy and non-energy leasable minerals, mineral assessments, and locatable minerals. It provides technical assistance and coordinates activities relating to ANILCA 1010 mineral assessments. The Division provides the basis for economic analysis relating to energy and mineral development in the state. It also provides leadership and technical assistance on abandoned mine lands inventories and impacts on public lands.

Energy Branch Functions:
The Branch is responsible for the federal onshore mineral leasing programs and functions; including oil and gas, geothermal resources, coal, and other energy and non-energy minerals. The Branch prepares and conducts oil and gas lease sales and is responsible for preparing pre- and post-lease sale fair market value evaluations for National Petroleum Reserve–Alaska leasing, and issuing leases; adjudicates oil and gas leases, transfers, and bonds; approves oil and gas industry operations for federal onshore oil and gas leases; protects federal lands from drainage of oil and gas resources, and inspects industry operations for compliance; and coordinates with other federal surface management agencies for the leasing and monitoring of minerals operations under their jurisdictions.

Solid Minerals Branch Functions:
The Branch maintains mining claim and mineral patent case files and electronic public minerals records related to those files. It adjudicates federal mining claim recordation filings, annual assessment affidavits, and timely payment of annual claim holding fees. It also adjudicates mineral survey and patent applications, and serves contest complaints for all federal lands in Alaska.

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)
http://www.glennallen.ak.blm.gov

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

Nome Field Station
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
(907) 474-2282 (fax)
1-800-437-7021

Tok Field Station
P.O. Box 309
Tok, AK 99780
(907) 883-5121
(907) 883-5123 (fax)

U.S. Fish and Wildlife Service
Region 7 Office
Mail Stop 361
1011 East Tudor Rd.
Anchorage, AK 99503
(907) 786-3542
http://alaska.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 Fish and Wildlife Field Office
101 12th Ave., Room 110
Fairbanks, AK 99701
(907) 456-0203
(907) 456-0208 (fax)

U.S. Fish and Wildlife Service
Juneau Fish and Wildlife Field Office
3000 Vintage Blvd., Ste. 201
Juneau, AK 99801-7100
(907) 780-1160
(907) 586- 7154 (fax)

U.S. Fish and Wildlife Service
Anchorage Fish and Wildlife Field Office
605 West 4th Ave., Rm. G-61
Anchorage, AK 99501
(907) 271-2888
(907) 271-2786 (fax)

U.S. Geological Survey
Alaska Science Center
Geological Science Office
4200 University Dr.
Anchorage, AK 99508-4667
(907) 786-7479

The mission of the USGS Alaska Science Center (ASC) is to provide scientific leadership and accurate, objective, and timely data, information, and research findings about the earth and its flora and fauna to Federal and State resource managers and policy makers, local government, and the public to support sound decision making regarding natural resources, natural hazards, and ecosystems in Alaska and circumpolar regions.

Geologic Discipline programs in the ASC are based on insightful monitoring, assessments, and research activities that address natural hazards, earth resources, and geologic processes. The Geologic Discipline provides comprehensive, high quality, and timely scientific information to decision makers at Federal, State, and local government levels, as well as the private sector. The Minerals Program investigates and reports on the occurrence, quality, quantity, and environmental characteristics of mineral resources in Alaska, the processes that create and modify them, models for assessing mineral endowment, and the potential impacts of mineral development.

U.S. Geological Survey
Alaska Science Center
National Geospatial Program Office
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
Natural Resources Science Team
240 W. 5th Ave.
Anchorage, AK 99501
(907) 644-3571
(907) 644-3809 (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
Physical Addres:
222 W. 8th Ave A-35
Anchorage, AK 99513
(907) 271-1250
(907) 271-1252 (fax)
email: bowen.ayers@dol.gov

Mailing Address:
Anchorage Federal Building
US Courthouse - Rm. A-35
222 West 7th Ave., Box 30
Anchorage, AK 99513
(907) 271-1250
(907) 271-1252 (fax)
email: bowen.ayers@dol.gov

Function: Administers health and safety standards to protect the health and safety of metal, nonmetal, and coal miners. Cooperates

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, R.L.M.
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/r10earth/

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/r10earth/

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
709 W 9th St., Rm. 223A
Box 20370 (mailing)
Juneau, AK 99802-0370
(907) 586-7619

U.S. DEPARTMENT OF THE ARMY
Corps of Engineers
Regulatory Division
2204 3rd St.
P.O. Box 6898
Elmendorf Air Force Base, AK 99506-0898
(907) 753-2712
(907) 753-5567 (fax)
(800) 478-2712 (in Alaska only)
http://www.poa.usace.army.mil/reg

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. Under Section 404 of the Clean Water Act, the Corps of Engineers issues dredge and fill permits for certain mining activities in waters of the United States. 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, Fish and Game, and Community and Economic Development.

BOARDS AND COMMISSIONS

Alaska Minerals Commission
Irene Anderson, Chair
c/o Bering Straits Native Corp.
P.O. Box 1008
Nome, AK 99762
(907) 443-5252
(907) 443-4317
(907) 443-2985 (fax)
email: irene@beringstraits.com

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.

CHAMBERS OF COMMERCE

Alaska State Chamber of Commerce
217 Second St., Ste. 201
Juneau, AK 99801
(907) 586-2323
(907) 463-5515 (fax)
email: info@alaskachamber.com
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
1016 W. 6th Ave., Ste. 303
Anchorage, AK 99501
(907) 272-2401
email: info@anchoragechamber.org
http://www.anchoragechamber.org

Function: To be effective as a business leader by supporting and focusing its broad-based membership in their efforts to grow Anchorage into a premier American city.

Greater Fairbanks Chamber of Commerce
100 Cushman St., Ste. 102
Fairbanks, AK 99701
(907) 452-1105
(907) 456-6968 (fax)
email: info@fairbankschamber.org
http://www.fairbankschamber.org

Juneau Chamber of Commerce
3100 Channel Dr., Ste. 300
Juneau, AK 99801
(907) 463-3488
(907) 463-3489 (fax)
email: juneauchamber@gci.net
http://www.juneauchamber.org

PUBLIC INTEREST GROUPS AND ASSOCIATIONS

Alaska Miners Association Inc.
Statewide Office
Steven C. Borell, P.E., Executive Director
3305 Arctic Blvd., Ste. 105
Anchorage, AK 99503
(907) 563-9229
(907) 563-9225 (fax)
email: ama@alaskaminers.org
http://www.alaskaminers.org

AMA BRANCHES

Anchorage	Juneau
Denali	Kenai
Fairbanks	Nome

Please contact AMA for current contacts

Alaskans for Responsible Mining
810 N St.
Anchorage, AK 99501
(907) 277-0005
(907) 277-0990 (fax)
email: vanessa@reformakmines.org
http://www.reformakmines.org

American Institute of Professional Geologists
1400 W. 122nd Ave., Ste. 250
Westminster, CO 80234
(303) 412-6205
(303) 253-9220 (fax)
email: aipg@aipg.org
http://www.aipg.org

Earthjustice
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) 339-3900
(907) 339-3980 (fax)

Northern Alaska Environmental Center
830 College Rd.
Fairbanks, AK 99701-1535
(907) 452-5021
(907) 452-3100 (fax)
email: info@northern.org
http://www.northern.org

Northwest Mining Association
10 North Post St., Ste. 220
Spokane, WA 99201
(509) 624-1158
(509) 623-1241 (fax)
email: info@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
http://www.akrdc.org

Society for Mining, Metallurgy, and Exploration Inc.
8307 Shaffer Parkway
Littleton, CO 80127
(303) 973-9550
(303) 973-3845 (fax)
email: sme@smenet.org
http://www.smenet.org

Southeast Alaska Conservation Council (SEACC)
419 6th St., Ste. 200
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
http://www.trustees.org

ORGANIZED MINING DISTRICTS

Circle Mining District
P.O. Box 30181
Central, AK 99730-0181
(907) 520-5419 (message)

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

Haines Mining District
P.O. Box 149
Haines, AK 99827
(907) 766-2821

Iditarod Mining District
John A. Miscovich
1320 K St.
Anchorage, AK 99501-4327

Yentna Mining District
Carol Young
P.O. Box 211
Talkeetna, AK 99676
(907) 733-2351

MINERAL EDUCATION PROGRAMS

ALASKA MINERAL AND ENERGY RESOURCE EDUCATION FUND (AMEREF)
121 W. Fireweed Ln., Ste. 220
Anchorage, AK 99503
(907) 276-5487
(907) 276-3887 (fax)
email: kits@ameref.org
http://www.ameref.org

Function: A 501(c)(3) educational non-profit whose mission is to provide Alaskan students with the knowledge and skills to make informed and objective decisions relating to mineral, energy, and forest resources.

NATIVE REGIONAL CORPORATIONS

AHTNA INC.
Kathryn Martin
VP Land and Resources
P.O. Box 649
Glennallen, AK 99588-0649
(907) 822-3476
(907) 822-3495 (fax)
email: kmartin@ahtna-inc.com
http://www.ahtna-inc.com/

Anchorage Office
406 W. Fireweed, Ste. 201
Anchorage, AK 99503
(907) 868-8202
(907) 868-8284 (fax)
email: brebne@ahtna-inc.com
http://www.ahtna-inc.com/

THE ALEUT CORP.
4000 Old Seward Hwy., Ste. 300
Anchorage, AK 99503-6087
(907) 561-4300
(907) 563-4328 (fax)
email: MSmith@aleutcorp.com
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
3900 C St., Ste. 801
Anchorage, AK 99503-5963
(907) 339-6000
(907) 339-6028 (fax)

BERING STRAITS NATIVE CORP.
Irene Anderson
Land Manager
P.O. Box 1008
Nome, AK 99762-1008
(907) 443-4317
(907) 443-2985 (fax)
email: irene@beringstraits.com
http://www.beringstraits.com/

Anchorage Office
Matt Ganley
10315 Main Tree Dr.
Anchorage, AK 99507
(907) 632-7197
(907) 868-0126 (fax)
email: matt@beringstraits.com

BRISTOL BAY NATIVE CORP.
111 West 16th Ave., Ste. 400
Anchorage, AK 99501-5109
(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) 279-8430 (fax)
http://www.calistacorp.com/

CHUGACH ALASKA CORP.
560 E. 34th Ave.
Anchorage, AK 99503-4196
(907) 563-8866
(907) 561-6961 (fax)
email: rrogers@chugach-ak.com
http://www.chugach-ak.com/

COOK INLET REGION INC.
and its subsidary North Pacific
Mining Corporation
2525 C St., Ste. 500
Anchorage, AK 99503
(907) 274-8638
(907) 263-5190 (fax)
email: kcunningham@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: lands@doyon.com
http://www.doyon.com

KONIAG INC.
104 Center Ave., Ste. 205
Kodiak, AK 99615
(907) 4862530
(907) 486-3325 (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.com

Anchorage Office
Nana Development Corp.
1001 E. Benson Blvd.
Anchorage, AK 99508
(907) 265-4100
(907) 265-4311 (fax)

SEALASKA CORP.
One Sealaska Plaza, Ste. 400
Juneau, AK 99801
(907) 586-1512
(907) 463-3897 (fax)
http://www.sealaska.com/

APPENDIX E
Alaska Mining Websites
Mining and Exploration Companies

Alaska Earth Sciences Inc.	http://www.aes.alaska.com
Anchorage Sand and Gravel Co. Inc.	http://www.anchsand.com
Andover Ventures Inc.	http://www.andoverventures.com/
Anglo American plc	http://www.angloamerican.co.uk/
Avalon Development Corp.	http://www.avalonalaska.com
Barrick Gold Corp.	http://barrick.com/
BHP Billiton Ltd.	http://www.bhpbilliton.com/
Bravo Venture Group Inc.	http://www.bravoventuregroup.com/en/index.php?page=home
Brett Resources Inc.	http://www.brettresources.com/s/Home.asp
Browns Hill Quarry	http://bricecompanies.com/quarry/quarry.html
Century Mining Corp.	http://www.centurymining.com
Clark–Wiltz Mining	http://www.clark-wiltz.com/
Coeur d'Alene Mines Corp. (Coeur Alaska Inc.)	http://www.coeur.com
Constantine Metal Resources Inc.	http://www.constantinemetals.com/
Copper Ridge Explorations Inc.	http://www.copper-ridge.com
Exclusive Paving Inc.	http://www.exclusivepaving.com/
Freegold Ventures Ltd.	http://www.freegoldventures.com
Full Metal Minerals Ltd.	http://www.fullmetalminerals.com
Geocom Resources Inc.	http://www.geocom-resources.com
Geoinformatics Exploration Inc	http://www.geoinformex.com
Geologix Explorations Inc.	http://www.geologix.ca
Golconda Resources Ltd.	http://www.golcondaresources.com
Gold Crest Mines Inc.	http://www.goldcrestminesinc.com/
Grayd Resource Corp.	http://www.grayd.com
Great Northwest Inc.	http://www.grtnw.com/
Greens Creek Mining Co.	http://www.greenscreek.com/
Hecla Mining Co.	http://www.hecla-mining.com
Hidefield Gold Plc.	http://www.hidefield.co.uk/s/Home.asp
International Tower Hill Mines Ltd. [Talon Gold (US) LLC]	http://www.ithmines.com/s/home.asp
Kennecott Exploration Co.	http://www.kennecottexploration.com
Kennecott Minerals Co.	http://www.kennecottminerals.com
Kinross Gold Corp. (Fairbanks Gold Mining Inc.)	http://www.kinross.com
Lafarge North America Inc.	http://www.lafargenorthamerica.com/wps/portal/
Liberty Star Gold Corp.	http://www.libertystargold.com
Linux Gold Corp.	http://www.linuxgoldcorp.com
Little Squaw Gold Mining Co.	http://www.littlesquawgold.com
Max Resource Corp.	http://www.maxresource.com/s/ContactUs.asp
Metallica Resources Inc.	http://www.metal-res.com/
Midas Resources Ltd.	http://www.midasresources.com.au/
Moore Creek Mining LLC	http://www.moorecreek.com/index.html
Nevada Star Resource Corp.	http://www.nevadastar.com
Niblack Mining Corp.	http://www.niblackmining.com/s/Home.asp
Northern Associates Inc.	http://www.alaskaexploration.com
Northern Dynasty Minerals Ltd.	http://www.northerndynastyminerals.com
NovaGold Resources Inc.	http://www.novagold.net
Pacific North West Capital Corp.	http://www.pfncapital.com
Piper Capital Inc.	http://www.pipercapitalinc.com/s/Home.asp
Quaterra Resources Inc.	http://www.quaterraresources.com/
Red Diamond Mining Co.	http://home.gci.net/~rdmc/reddiamondmining/
Rimfire Minerals Corp.	http://www.rimfire.bc.ca
Rio Tinto Ltd.	http://www.riotinto.com/
Rubicon Minerals Corp.	http://www.rubiconminerals.com

Santoy Resources Ltd.	http://www.santoy.ca
Select Resources Corp. (Tri-Valley Corp.)	http://www.tri-valleycorp.com
Shear Minerals Ltd.	http://www.shearminerals.com
Silverado Gold Mines Ltd.	http://www.silverado.com
Sisyphus Consulting	http://www.sisyphus-consulting.com
St. Andrew Goldfields Ltd.	http://www.standrewgoldfields.com
Sumitomo Metal Mining Co. Ltd	http://www.sumitomocorp.co.jp/english/section_e/shigen/index.shtml
Teck Cominco Ltd.	http://www.teckcominco.com
Teryl Resources Corp.	http://www.terylresources.com
TNR Gold Corp.	http://www.tnrgoldcorp.com
Tonogold Resources Inc.	http://www.tonogold.com/s/Home.asp
Triex Minerals Corp.	http://www.triexminerals.com/s/Home.asp
Usibelli Coal Mine Inc.	http://www.usibelli.com
Western Keltic Mines Inc.	http://www.keltic.com
Western Warrior Resources Inc.	http://www.westernwarrior.ca
WGM Inc.	http://www.wgm.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://www.bbnc.net
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

General

Alaska Miners Association	http://www.alaskaminers.org
Alaska Division of Geological & Geophysical Surveys	http://www.dggs.dnr.state.ak.us
Alaska Division of Community & Business Development	http://www.commerce.state.ak.us/oed/home.htm

Alaska's Minerals Data and Information Rescue in Alaska (MDIRA) Project Websites

MDIRA Portal Home Page	http://akgeology.info
Alaska Geology Map Indexer	http://maps.akgeology.info
Alaska Mining Claims Information System	http://akmining.info
Alaska Resource Data Files	http://ardf.wr.usgs.gov
DGGS Publications On-Line	http://www.dggs.dnr.state.ak.us/pubs/pubs
Digital Index of Geological Information	http://imcg.wr.usgs.gov/digi.html
DNR Sites Related to Mining Applications and Forms	http://www.dnr.state.ak.us/mlw/forms
Guide to Alaska Geologic and Mineral Information	http://wwwdggs.dnr.state.ak.us/scan1/ic/text/IC44.PDF
Land Records Web Application	http://plats.landrecords.info/index.html
NURE Data	http://pubs.usgs.gov/of/1997/ofr-97-0492/quad_ak/q_iditar.htm
On-Line Annual Payments	https://www.dnr.state.ak.us/cc_payment/LAS_Form.cfm
RASS, PLUTO Geochemistry Data	http://geopubs.wr.usgs.gov/open-file/of99-433
State Map Library	http://www.dnr.state.ak.us/lris/gis_maplib/maplib_start.cfm
State Recorder's Office Search	http://www.dnr.state.ak.us/ssd/recoff/search.cfm
State Uniform Commercial Code (UCC) Documents Search	http://www.dnr.state.ak.us/ssd/ucc/search.cfm

APPENDIX F
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 G
Primary metals production in Alaska, 1880-2006[a]

Year	Gold[b] (oz)	Gold[b] (m$)	Silver (oz)	Silver (t$)	Mercury (flask[c])	Mercury (t$)	Antimony (lb)	Antimony (t$)	Tin (lb)	Tin (t$)	Lead (tons)	Lead (t$)	Zinc (tons)	Zinc (t$)	Platinum[d] (oz)	Platinum[d] (t$)	Copper (lb)	Copper (m$)	Chromium (tons)	Chromium (t$)
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[d]	44.1[d]	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[d]	4.3[d]	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[d]	202.3[d]	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[d]	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[d]	61.0[d]	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[d]	1.0[d]	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	--	--
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

APPENDIX G, *cont'd*

Year	Gold[b] (oz)	Gold[b] (m$)	Silver (oz)	Silver (t$)	Mercury (flask[c])	Mercury (t$)	Antimony (lb)	Antimony (t$)	Tin (lb)	Tin (t$)	Lead (tons)	Lead (t$)	Zinc (tons)	Zinc (t$)	Platinum[d] (oz)	Platinum[d] (t$)	Copper (lb)	Copper (m$)	Chromium (tons)	Chromium (t$)
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[d]	1,200.0[d]
1977	50,000	7.80	8,000	20.0	--	--	W	W	W	W	--	--	--	--	6,891	1,119.8	--	--	--	--
1978	60,000	12.00	6,000	50.0	--	--	W	W	W	W	--	--	--	--	--	--	--	--	--	--
1979	65,000	18.00	6,500	93.0	--	--	100,000	125.0	100,000	830.0	--	--	--	--	--	--	--	--	--	--
1980	75,000	32.00	7,500	111.0	--	--	--	--	120,000	984.0	31	29.0	--	--	--	--	--	--	--	--
1981	134,200	55.20	13,420	111.3	W	W	--	--	106,000	700.0	--	--	--	--	900	200.0	--	--	--	--
1982	175,000	69.90	22,000	198.0	--	--	--	--	198,000	1,365.0	--	--	--	--	W	W	--	--	--	--
1983	169,000	67.60	33,200	332.0	--	--	22,400	45.0	215,000	1,100.0	--	--	--	--	W	W	--	--	--	--
1984	175,000	62.13	20,000	159.0	5	1.5	135,000	225.8	225,000	400.0	--	--	--	--	W	W	--	--	--	--
1985	190,000	61.18	28,500	171.0	27	10.0	65,000	98.0	300,000	650.0	--	--	--	--	--	--	--	--	--	--
1986	160,000	60.80	24,000	134.4	12	2.8	45,000	67.5	340,000	890.0	--	--	--	--	W	W	--	--	--	--
1987	229,707	104.51	54,300	391.0	--	--	--	--	288,000	460.0	--	--	--	--	W	W	--	--	--	--
1988	265,500	112.84	47,790	282.0	W	W	--	--	300,000	950.0	--	--	--	--	25	13.8	--	--	--	--
1989	284,617	108.70	5,211,591	27,300.0	--	--	--	NR	194,000	672.0	9,585	7,700.0	19,843	29,400.0	--	--	--	--	--	--
1990	231,700	89.20	10,135,000	50,675.0	--	--	--	--	57,000	200.0	44,220	30,954.0	181,200	253,680.0	--	--	--	--	--	--
1991	243,900	88.29	9,076,854	39,110.0					6,800	22.1	69,591	33,403.7	278,221	278,221.0	15	5.3	--	--	--	--
1992	262,530	88.46	9,115,755	34,913.0	--	--	--	--	1,500	5.9	68,664	31,585.0	274,507	301,957.7	--	--	--	--	--	--
1993	191,265	68.64	5,658,958	24,333.0	--	--	--	--	21,000	50.6	38,221	13,759.6	268,769	236,516.7	3	1.2	--	--	--	--
1994	182,100	70.29	1,968,000	10,391.0	--	--	--	--	--	--	36,447	25,512.9	329,003	296,102.7	5	2.1	--	--	--	--
1995	141,882	56.04	1,225,730	6,655.0	--	--	--	--	--	--	58,098	34,428.6	359,950	345,552.0	1	0.4	--	--	--	--
1996	161,565	62.62	3,676,000	19,078.0	--	--	--	--	--	--	70,086	52,284.0	366,780	361,646.0	2	0.8	780,000	0.80	--	--
1997	590,516	207.29	14,401,165	70,710.0	--	--	--	--	--	--	88,560	49,593.0	419,097	494,888.0	--	--	3,440,000	3.54	--	--
1998	594,191	174.62	14,856,000	82,154.0	--	--	--	--	--	--	102,887	49,386.0	549,348	505,400.0	--	--	3,800,000	2.85	--	--
1999	517,890	144.26	16,467,000	85,628.0	--	--	--	--	--	--	125,208	57,596.0	643,642	630,769.0	--	--	4,200,000	3.00	--	--
2000	546,000	152.39	18,226,615	90,404.0	--	--	--	--	--	--	123,224	51,754.0	669,112	682,494.0	--	--	2,800,000	2.30	--	--
2001	550,644	149.25	16,798,000	73,408.0	--	--	--	--	--	--	127,385	56,049.0	634,883	507,907.0	--	--	2,800,000	1.99	--	--
2002	562,094	174.28	17,858,183	82,326.0	--	--	--	--	--	--	--	--	--	--	--	--	3,200,000	2.27	--	--
2003	528,191	191.93	18,589,100	95.3	--	--	--	--	--	--	162,479	64,279.0	714,769	536,348.0	--	--	--	--	--	--
2004	456,508	192.34	16,947,270	113.1	--	--	--	--	--	--	150,796	120,636.8	680,015	651,432.2	--	--	--	--	--	--
2005	427,031	189.92	11,670,000	85.4	--	--	--	--	--	--	131,366	115,230.4	684,462	862,108.0	--	--	--	--	--	--
2006	570,129	344.05	16,489,394	190.4	--	--	--	--	--	--	157,128	183,629.3	673,967	2,002,971.4	--	--	--	--	--	--
Other[e]	--	--	--	--	1,438	--	--	--	--	--	--	--	--	--	71,946	17,091.9	--	--	--	--
TOTAL	**39,378,482**	**3,955**	**228,388,31**	**713,916**	**42,392**	**9,911**	**11,070,80**	**6,655**	**7,287,70**	**12,524**	**1,736,707**	**1,042,304**	**8,466,35**	**9,480,068**	**740,494**	**82,908**	**1,395,615,53**	**245**	**39,05**	**3,427**

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

APPENDIX H

Production of industrial minerals, coal, and other commodities in Alaska, 1880-2006

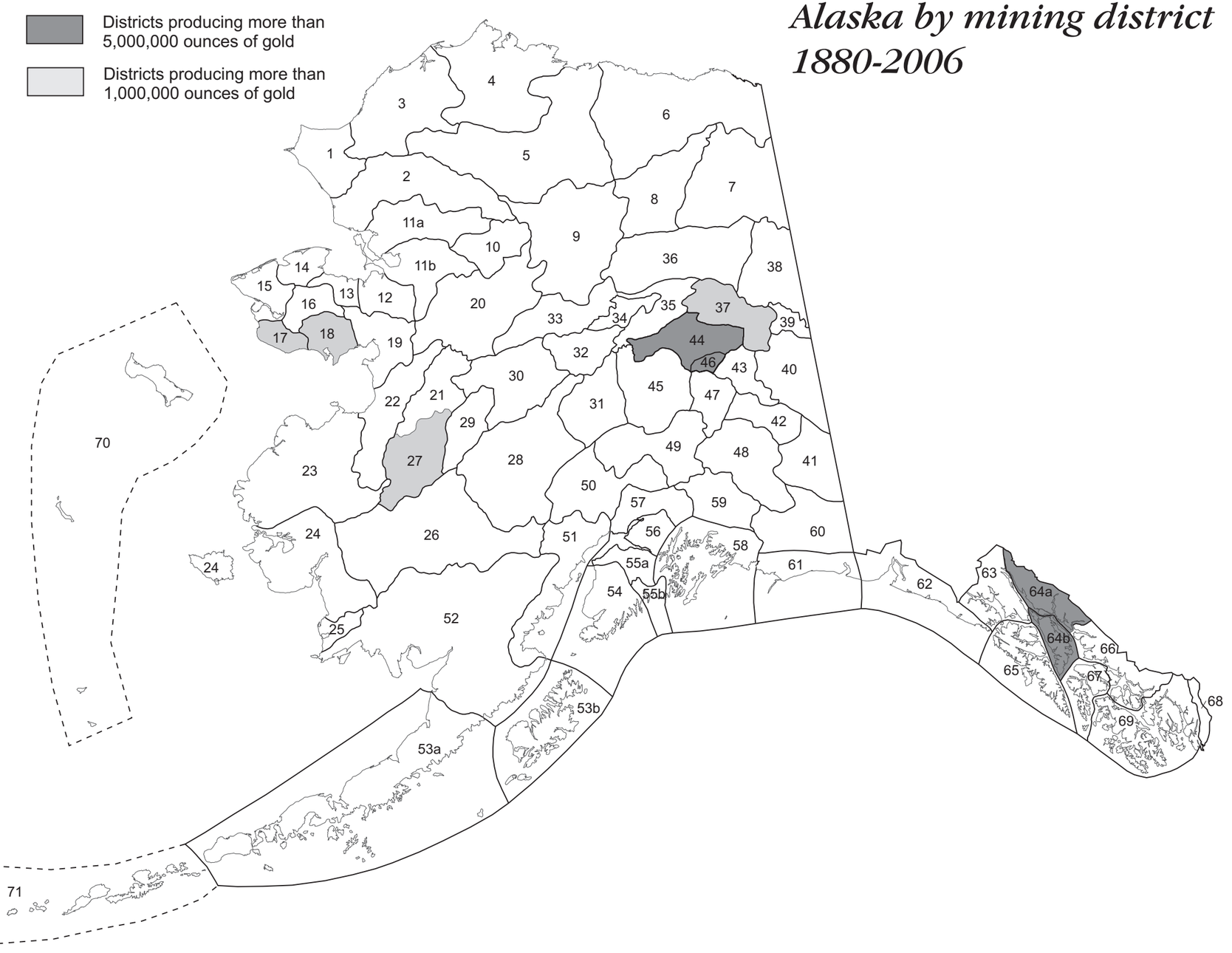
Year	Coal		Sand and gravel		Rock[a]		Barite		Other[b]
	s. tons	m$	s. tons	m$	s. tons	m$	s. tons	t$	$
1880-1899[c]	19,429	0.14	- -	- -	7,510	0.04	- -	- -	- -
1900	1,200	0.02[d]	- -	- -	510	0.01	- -	- -	- -
1901	1,300	0.02[d]	- -	- -	700	0.01	- -	- -	500
1902	2,212[d]	0.02[d]	- -	- -	800	0.01	- -	- -	255
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	5.88	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	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	5,163,000
1970	786,000[d]	5.28[d]	20,375,000[d]	26.07[d]	6,470,000	10.01	134,000	1,875.00	7,994,000
1971	748,000[d]	5.05[d]	26,391,000	41.99	2,658,000	5.07	102,000	1,075.00	- -
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	1,792.00	12,846,000
1974	700,000	7.34	118,740,000[d]	240.94[d]	5,484,000	12.95	110,000	1,895.00	14,495,000
1975	766,000	7.81	48,145,000	95.78	8,877,000	26.65	2,000	30	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	- -
1979	750,000	16.00	50,900,000	104.90	3,650,000	15.45	20,000	800	930,000
1980	800,000	16.00	40,000,000	86.00	3,700,000	15.40	50,000	2,000.00	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	22.1	- -	- -	400,000
1991	1,540,000	39.00	14,160,011	45.45	3,000,000	22.5	- -	- -	462,000
1992	1,531,800	38.30	14,599,746	42.2	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	32.2	3,000,045	23.56	- -	- -	200,000
1997	1,446,000	38.05	13,800,000	51.91	3,200,000	20.00	- -	- -	217,000
1998	1,339,000	35.23	12,363,450	57.28	1,636,200	14.04	- -	- -	215,000
1999	1,560,000	41.05	10,600,000	52.42	1,640,000	18.01	- -	- -	- -
2000	1,473,355	38.77	10,600,000	49.86	5,200,000	36.59	- -	- -	- -
2001	1,537,000	48.11	10,360,000	55.22	3,091,000	27.18	- -	- -	- -
2002	1,158,000	37.40	22,412,000	120.7	3,152,000	31.44	- -	- -	- -
2003	1,088,000	38.08	11,868,001	64.14	861,382	10.41	- -	- -	175,000
2004	1,450,000	50.75	19,576,092	101.51	7,312,050	106.21	- -	- -	2,732,554
2005	1,402,174	49.08	16,620,009	76.54	2,803,172	22.55	- -	- -	809,642
2006	1,397,500	48.91	13,953,465	63.35	2,369,738	24	- -	- -	1,057,500
Other[d]	- -	- -	- -	- -	2300000[e]	W	79,000	W	- -
TOTAL[f]	**63,680,009**	**1,243**	**1,258,223,567**	**2,988**	**143,522,342**	**811**	**856,000**	**11,417**	**182,536,568**

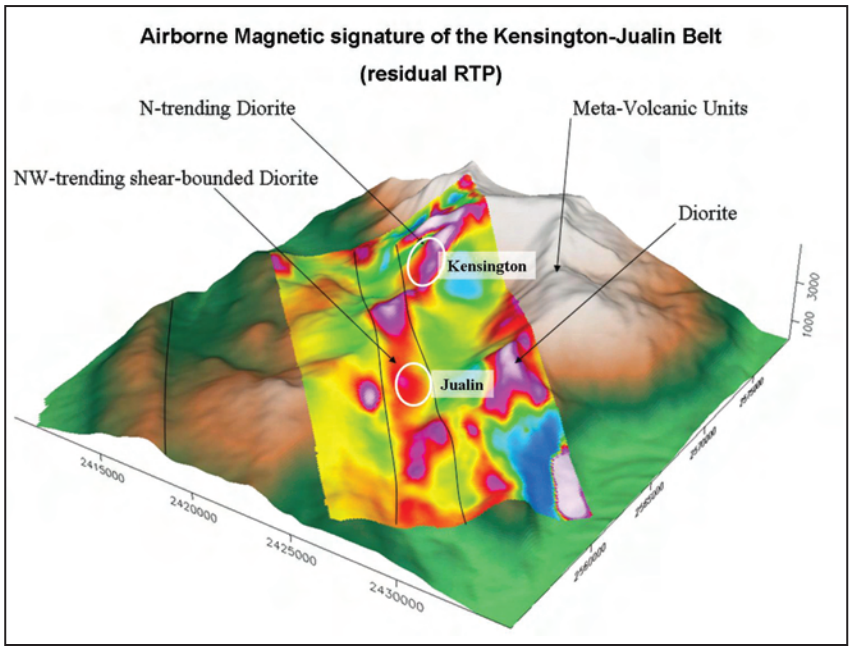
[a]Building stone production figures for 1880-1937 are for the southcentral and interior regions of Alaska only. Contains limestone 2004.
[b]Includes 2.4 million lbs of U_3O_8 (1955-71); 505,000 tons gypsum (1905-26); 286,000 lbs WO_3 (intermittently 1916-80); 94,000 lbs asbestos (1924-44); 540,000 lbs graphite (1917-18 and 1942-50); and undistributed amounts of zinc, jade, peat, clay, soapstone, miscellaneous gemstones, and other commodities (1880-1993).
[c]Production not traceable to a specific year or period.
[d]When state (territorial) and federal figures differ significantly, state figures are used. Figures for sand and gravel production in 1974 show state estimates (118,740,000 short tons; $240.94m) and federal (421,614,000 short tons - $88.96m). The federal estimate was not added to total production.
[e]Marble quarried on Prince of Wales Island, southeastern Alaska (1900-41).
[f]Rounded to nearest 1,000 ton.
m$ - million of dollars.
t$ - thousands of dollars
- - Not reported
W - Withheld.

Total gold production in Alaska by mining district 1880-2006

	Mining districts[a]	Production (in refined troy ounces) Total production	Placer	Lode
1	Lisburne district			
2	Noatak district	7,800	7,800	0
3	Wainwright district	0	0	0
4	Barrow district	0	0	0
5	Colville district	0	0	0
6	Canning district	0	0	0
7	Sheenjek district	0	0	0
8	Chandalar district	66,287	48,887	17,400
9	Koyukuk district	347,661	347,661	0
10	Shungnak district	15,000	15,000	0
11	Kiana & Selawik districts	40,600	40,600	0
12	Fairhaven district (Candle subdistrict)	253,720	253,720	0
13	Fairhaven district (Inmachuk subdistrict)	348,924	348,924	0
14	Serpentine district	4,220	4,220	0
15	Port Clarence district	42,354	42,354	0
16	Kougarok district	179,411	179,411	0
17	Nome (Cape Nome) district	4,998,886	4,998,886	0
18	Council district	1,046,522	1,019,522	27,000
19	Koyuk district	84,322	84,322	0
20	Hughes district	289,104	289,104	0
21	Kaiyuh district	149,703	5,400	144,303
22	Anvik district[b]	7	7	0
23	Marshall district	124,506	124,506	0
24	Bethel district	42,945	42,945	0
25	Goodnews Bay district	29,700	29,700	0
26	Aniak district	595,366	595,366	0
27	Iditarod district	1,563,459	1,560,529	2,930
28	McGrath district	330,270	133,306	196,964
29	Innoko district	732,353	732,197	156
30	Ruby district	477,976	477,976	0
31	Kantishna district	99,307	91,401	7,906
32	Hot Springs district	582,620	582,620	0
33	Melozitna district	12,854	12,854	0
34	Rampart district	197,887	197,887	0
35	Tolovana district	529,573	529,573	0
36	Yukon Flats district	0	0	0
37	Circle district	1,075,293	1,075,293	0
38	Black district	0	0	0
39	Eagle district	52,000	52,000	0
40	Fortymile district	561,646	561,646	0
41	Chisana district	144,500	78,000	66,500
42	Tok district	280	280	0
43	Goodpaster district	2,350	2,050	300
44	Fairbanks district	12,291,653	8,197,458	4,094,196
45	Bonnifield district	86,225	79,525	6,700
46	Richardson subdistrict of Fairbanks district[c]	120,940	118,640	2,300
47	Delta River district	7,970	7,970	0
48	Chistochina district	182,719	182,719	0
49	Valdez Creek district	513,671	512,090	1,581
50	Yentna district	199,413	199,413	0
51	Redoubt district	105	105	0
52	Bristol Bay region	1,570	1,570	0
53	Kodiak district (53b)-Alaska Peninsula Region (53a)	112,402	4,802	107,600
54	Homer district	16	16	0
55	Hope & Seward districts	133,431	68,431	65,000
56	Anchorage district[d]	190	190	0
57	Willow Creek district	666,654	57,654	609,000
58	Prince William Sound district	137,790	90	137,700
59	Nelchina district	14,280	14,280	0
60	Nizina district	148,500	148,500	0
61	Yakataga district	18,040	18,040	0
62	Yakutat district[e]	13,200	2,200	11,000
63	Juneau district (partial)	82,064	82,064	0
64	Juneau (64a) & Admiralty (64b) districts	8,771,129	80,873	8,690,256
65	Chichagof district	770,000	0	770,000
66	Petersburg district	15,000	15,000	0
67	Kupreanof district	0	0	0
68	Hyder district	219	219	0
69	Ketchikan district	62,001	4,001	58,000
70	Bering Sea region	0	0	0
71	Aleutian Islands region	0	0	0
	Unknown (undistributed)[f]	29	29	0
	TOTAL	**39,378,618**	**24,361,827**	**15,016,792**
	Total production (troy ounces)	**39,378,618**		**(1,224.8 tonnes)**



[a]Mining district names and boundaries revised slightly from those defined by Ransome and Kerns (1954) and Cobb (1973). Sources of data: U.S. Geological Survey, U.S. Bureau of Mines, and Alaska Territorial Department of Mines records 1880-1930; U.S. Mint records 1930-1969; State of Alaska production records 1970-2006. Entries of "0" generally mean no specific records are available.
[b]Included in Marshall district.
[c]Not included in total for Fairbanks district.
[d]Most placer gold production included in Willow Creek district.
[e]Includes lode production from Glacier Bay area and placer production from Lituya Bay area.
[f]Production that cannot be credited to individual districts due to lack of specific records or for reasons of confidentiality.



Above. *Aeromagnetic signature of diorite and metavolcanic host rocks on the Kensington and Jualin gold properties. Photo provided by Coeur Alaska Inc.*

Top Right. *Separating gravel from placer gold during sluicing operations at the Nolan Creek placer mine. Photo courtesy of Silverado Gold Mines Ltd.*

Middle Right. *Rich Hughes and Linda Carter working at the Office of Economic Development's booth at one of many trade shows. Photo by David Szumigala.*

Bottom Right. *Conducting grass-roots mineral exploration in Alaska during the "off-season." Photo courtesy of International Tower Hill Mines Ltd.*

Bottom Left. *Gold pour at the Fort Knox Mine. Photo provided by Fairbanks Gold Mining Co.*

Below. *A trainload of coal leaves Usibelli Coal Mine via the Alaska Railroad for transport to one of many customers. Photo by Chris Arend, provided by Usibelli Coal Mine Inc.*