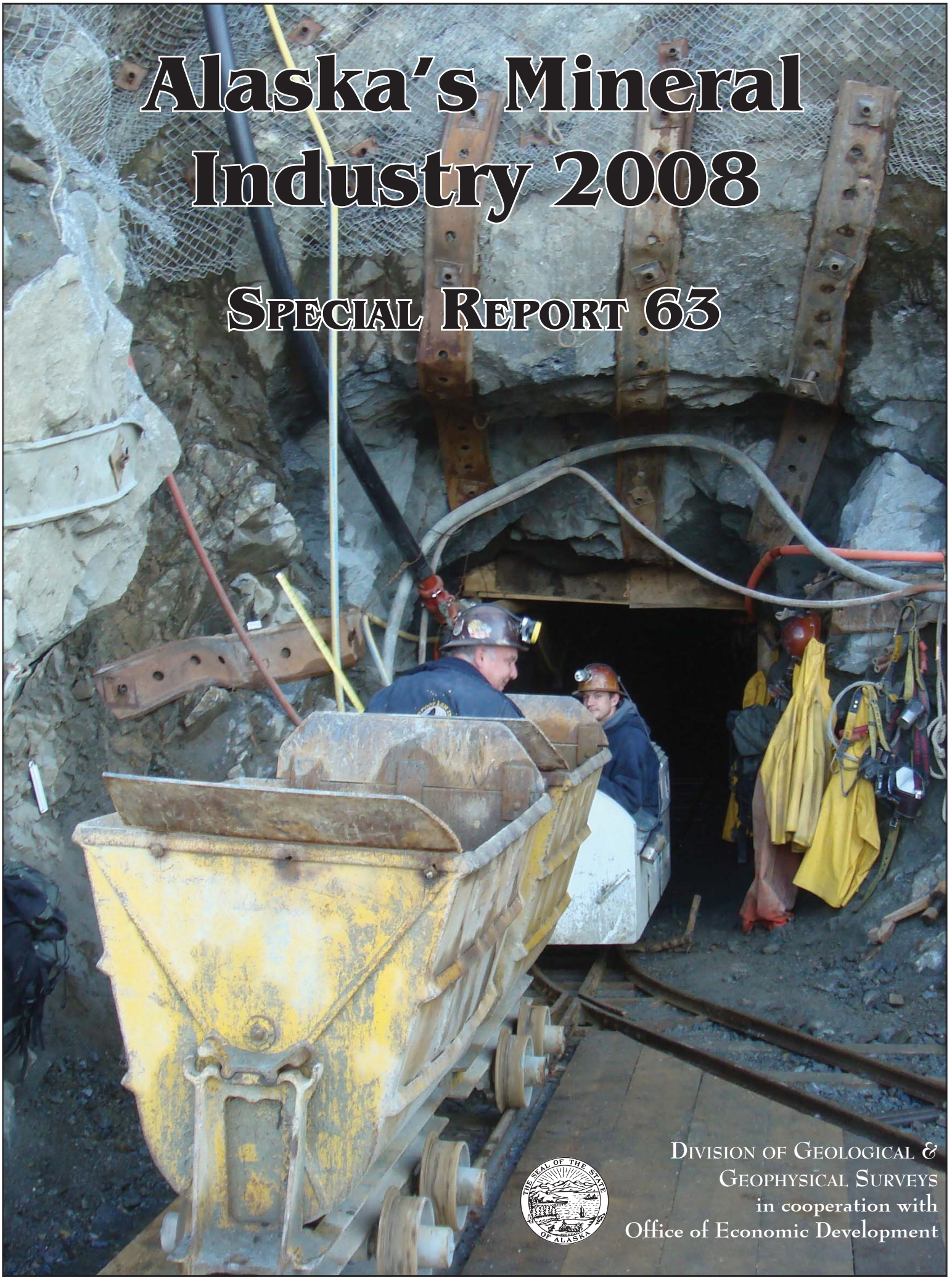
Alaska's Mineral Industry 2008

Special Report 63



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Front cover. *Accessing gold deposits at the Lucky Shot Mine via the Coleman adit. Full Metal Minerals rehabilitated the Coleman adit as part of their 2008 exploration program. Photo courtesy of Full Metal Minerals Ltd.*

Alaska's Mineral Industry 2008

by
D.J. Szumigala, R.A. Hughes, and L.A. Harbo

Division of Geological & Geophysical Surveys

SPECIAL REPORT 63

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GOVERNOR'S FOREWORD

Photo by Jeff Schultz of AlaskaStock.com, Anchorage, AK

Alaska's mineral industry is a vital sector of Alaska's economy. I am honored to present this report detailing the strengths and accomplishments of Alaska's mining industry.

Alaska's history is intertwined with mining history in a vast, and at times remote, frontier. Through the years, mining in Alaska has seen much success. Recall the placer gold camps in Fairbanks, Iditarod, and Nome; the hardrock mining camps for copper at Kennecott; and gold in Juneau. These miners were the building blocks for success stories at today's Red Dog and Fort Knox mines and are testament to the potential for future mines in Alaska. Our abundance of mineral wealth is just waiting to be discovered and produced.

Alaska's natural resources are abundant and spread across the state. Under Alaska's constitution, the State promotes responsible stewardship and wise development of these resources for the benefit of Alaska's people and our nation. As we reach the end of our first half-century of statehood and look eagerly to the future, we continue fulfilling this responsibility.

Today, Alaska has five large producing mines in the state: Fort Knox, Greens Creek, Pogo, Red Dog, and Usibelli. The Kensington gold project near Juneau is poised to join their ranks in the near future. Numerous small mines throughout the state also contribute to Alaska's economy. The combined efforts of our residents, local and state governments, as well as industry partners have contributed to Alaska's economy, all while protecting the environment.

Mining brings stable jobs for Alaskans at some of our highest paying wages. In 2008, mining generated an estimated 3,392 full-time jobs in both urban and, notably, rural areas, where residents welcome the possibility of local employment. The mineral industry and support industries will continue to generate additional jobs as more prospects prove viable.

I am proud of the accomplishments of the men and women who constitute Alaska's mining community, and of the spirit that makes those accomplishments possible. After all, Alaska's most important resources are her people who live each day to make our home a better place. As Alaskans, we can all look to the future with excitement and confidence.

Governor Sean Parnell

COMMISSIONER'S FOREWORD

The Department of Commerce, Community & Economic Development (DCCED) is pleased to collaborate with the Department of Natural Resources (DNR) to bring you the 28th annual report on Alaska's mineral industry.

This report reflects a decline in the total value of the industry, but clearly shows that the Alaska mineral industry continues to mature and expand. The Department of Commerce encourages the growth in this arena by promoting the responsible development of Alaska's vast and diverse mineral resources.

In 2008, for the 12th consecutive year, the total value of the industry easily exceeded $1 billion and actually eclipsed $3 billion. The value declined by approximately $844 million, 21.0 percent, compared to 2007, reflecting dramatically lower metal prices in 2008. Declining metal prices and steep increases in the prices of fuel and other supplies had a negative effect on the value of production and net income to producers. According to the U.S. Geological Survey, Alaska slipped from fifth to eighth in ranking among the 50 states in the value of non-fuel mineral production; this was primarily due to base metal price declines. Although exploration and development expenditures were higher in 2008 than in 2007, the impact of the general economic decline in the latter half of the year negatively affected exploration and development activity.

Existing mines and projects provided approximately 3,392 high-paying jobs in 2008, only slightly fewer than in 2007. Demand for skilled and technical workers exceeded availability. Although a short-term decline in employment is forecast, job opportunities are expected to increase in future years to staff a number of major projects now in progress.

Pogo Mine continued to improve productivity with 347,219 ounces of gold reported for 2008, nearing full production potential. Coeur Alaska continued construction until October at the Kensington project, but was not able to settle the tailings disposal issue revolving around using the Lower Slate Lake disposal site. This issue was heard in 2009 by the U.S. Supreme Court, which ruled that Lower Slate Lake could be used for tailings disposal. However, while waiting for that decision, Coeur suspended all but sustaining activity last October and laid off half of its employees until the court ruled on the issue. Rock Creek/Big Hurrah was in the advanced stages of development with initial production expected in late 2008. However, project activity was suspended in late November by unanticipated startup and environmental challenges. Barrick/NovaGold's advanced-stage Donlin Creek gold exploration project continues to move forward with feasibility studies, advanced ore definition, baseline monitoring, and engineering.

Other major exploration projects demonstrate the mineral potential and attractiveness of the state to the mining industry. The Pebble project in southwestern Alaska continues to be explored intensely by Northern Dynasty and Anglo American. Copper–gold porphyry projects in southcentral and southwestern Alaska include Whistler, Kawisgag, Mount Estelle, Pebble South, and Chisna projects. Intrusion-related gold exploration continues in the eastern Interior and southwestern Alaska at Livengood, Liberty Bell, Gold Hill, Kisa, and Vinasale. High-grade gold deposit exploration was conducted at Pogo, Lucky Shot, Golden Summit, Rob, Maple Leaf, Ganes Creek, and Little Squaw projects. Base-metal exploration was conducted at Red Dog, Lik-Su, and Arctic SEDEX and volcanogenic massive sulfide (VMS) properties in the Brooks Range, at the Palmer and Niblack VMS properties in southeastern Alaska, and at the Little White Man carbonate-replacement project in the eastern Interior region. Platinum and associated metals exploration continued at the MAN and Tonsina projects in the Alaska Range and in the Goodnews Bay area. The statewide minerals industry is forecast to grow significantly although commodity prices will influence the effort.

The Parnell/Campbell 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 of Commerce, Community and Economic Development

COMMISSIONER'S FOREWORD

Alaska's abundance of natural resources has drawn explorers for the past two centuries and remains the driving force in its economy. Fairbanks, Juneau, Nome, and other towns across the state developed around early mining camps; mining remains a significant local source of employment, infrastructure, and government revenue in many areas of the state. The unmatched geologic diversity of Alaska hosts a wide range of metallogenic settings and mineral commodities. The great mineral wealth of the state is evident from past production of world-class deposits—placer gold from the Fairbanks and Nome mining districts, copper from the Jumbo, Bonanza, Erie, Mother Lode, and Green Butte mines in the Kennecott district, gold from the Alaska–Juneau and Treadwell mines near Juneau, and placer platinum from the Goodnews Bay mining district. Significant deposits currently in production in Alaska include the Red Dog, Greens Creek, Fort Knox, and Pogo mines. Continued exploration at the Donlin Creek and Pebble deposits indicates that there are still mammoth mineral deposits to be developed in Alaska, and many believe there is high likelihood that other world-class Alaska mineral deposits remain to be discovered.

The mining industry continues to be an important sector of Alaska's economy, and it is doing so in an environmentally responsible manner. In 2008, the value of Alaska's mineral industry dropped to $3.171 billion from the all-time high reached of $4.015 billion in 2007 due to a combination of lower production volumes and lower metal prices. However, record mineral exploration expenditures and near-record mineral development expenditures point to continued investment in Alaska and likely increased production volumes in the future. In addition to providing 3,392 full-time jobs, the mineral industry was the largest taxpayer in the City and Borough of Juneau, the Fairbanks North Star Borough, the Denali Borough, and the Northwest Arctic Borough.

The increase in mining activity over the past decade or so comes with an increased public awareness of the industry, and increased scrutiny. I am proud of the environmental record of Alaska's mining industry, and I believe we have a sound permitting and regulatory system. Nevertheless, our process continues to be challenged, and wherever appropriate, we will continue to work to improve that process. Over the past years, state and federal regulators have made numerous presentations at various public forums throughout Alaska to inform the public about mining and mine permitting, as well as to hear the public's concerns. This effort will continue and I urge all Alaskans to attend these presentations and to educate themselves about mining and our regulatory process. I want all Alaskans to have confidence that we can responsibly permit and regulate mines.

Mining holds great promise for alleviating many of the economic challenges affecting many in rural Alaska areas. Large mines have the potential to lower energy costs for nearby communities by providing the base load to justify the high cost of local energy development, and provide high-paying mining jobs that afford local residents the economic means to support their families.

DNR continued rigorous science- and engineering-based review and regulation of mining projects in 2008 and worked diligently on reviews and permitting of major mining projects such as the Aqqaluk project at the Red Dog Mine, and the Walter Valley heap leach facility at Fort Knox mine. Other critical activities at DNR included permitting for ongoing major mine projects, monitoring and inspection of operating and closed mines, the remediation of abandoned mine lands from an era before the current permitting and regulatory regime, and involvement in litigation that had broad implications for mineral resources development throughout Alaska.

In 2008, DNR's Division of Geological & Geophysical Surveys (DGGS) continued its active data acquisition programs to gather and disseminate new geological and geophysical information. These programs provide unbiased scientific information on natural hazards, energy resources, and mineral occurrences that are essential for responsible development and maintaining a healthy economy. As part of that work, this report provides valuable information to Alaskans about our mining industry and is a tool we can all use as we continue to improve our stewardship of Alaska's natural resources.

Tom Irwin, Commissioner, Department of Natural Resources

EXECUTIVE SUMMARY

Alaska's Mineral Industry 2008 is the 28th annual report produced by the Division of Geological & Geophysical Surveys (in the Department of Natural Resources) and the Office of Economic Development (in the Department of Commerce, Community and Economic Development). This report and data supersede the summary report published earlier this year, DGGS Information Circular 58.

The total value of Alaska's mineral industry in 2008 dropped to $3.171 billion, $844 million and 21 percent lower than 2007's record value of $4.015 billion. The decline in total value was primarily a result of lower metal prices, increased operating costs, and a worldwide economic slowdown. The total value, although it is a combination of expenses and receipts, is an effective way to track the annual strength of the mineral industry. The year 2008 was the thirteenth consecutive year with a total value above $1 billion and the third consecutive year the total value exceeded $3 billion.

Total employment by the Alaska minerals industry in 2008 was 3,392 full-time-equivalent jobs, a decrease of 166 jobs (4.6 percent) from the 2007 total of 3,558 full-time-equivalent jobs. The largest change in employment compared to the previous year was the drop in mineral development jobs from 735 to 516, a 30 percent decrease. The average monthly wage for mining in Alaska during 2008 was $7,472.

The mineral industry paid a total of $96.1 million in royalty and tax payments to the State of Alaska and Alaska municipalities in 2008. Government revenues decreased considerably from the $158.6 million paid in 2007 due to lower net income in the mining industry and decreasing property values. State mineral rents and royalties amounted to $6.6 million; sales of rock, sand, and gravel amounted to $3.0 million; and mining license taxes totaled $16.0 million in 2008. Mining companies were the largest taxpayers in the City and Borough of Juneau and the Fairbanks North Star, Denali, and Northwest Arctic boroughs. The Alaska Industrial Development & Export Authority (AIDEA) was paid annual user fees of $16.2 million by mining companies for use of the DeLong Mountain Regional Transportation System and the Skagway Ore Terminal.

Exploration expenditures were $347.3 million in 2008, more than $18 million higher than the record $329.1 million spent in the previous year. The year 2008 was the second consecutive period with expenditures above $300 million and the fourth consecutive year with expenditures that exceeded $100 million. At least 74 exploration projects in Alaska reported spending more than $100,000 each and 35 of those projects spent more than $1 million each. Exploration took place across Alaska, but more than $228 million (or 65 percent of the exploration funds) were spent in southwestern Alaska. Companies explored for a wide variety of metals and mineralization styles. Two advanced exploration projects, the Pebble copper–gold–molybdenum and Donlin Creek gold projects, both in southwestern Alaska, accounted for more than 60 percent of the expenditures for exploration and drill footage during the year. Significant advances were made on the Livengood (Money Knob) gold, Lik base-metal, LWM polymetallic, Lucky Shot gold, Niblack polymetallic, and Ucore uranium and rare-earth-element projects.

Development expenditures for 2008, reported for 33 projects, totaled $396.2 million, up 24.3 percent from the $318.8 million spent in 2007 and the fifth year with development expenditures exceeding $200 million. Tailings storage facilities were expanded at Red Dog Mine. Construction of the Rock Creek Mine facilities was substantially completed during September and the startup process was initiated. Construction of heap leach facilities at Fort Knox Mine continued. PacRim Coal LP continued baseline sampling and permitting efforts at their Chuitna Coal project near Anchorage. Coeur Alaska Inc. curtailed construction efforts at the Kensington project in October, pending the U.S. Supreme Court decision on tailings disposal. Hecla Mining Co. acquired 100 percent ownership of Greens Creek Mine in 2008 and continued underground development efforts.

Mineral production volumes remained strong; however, the value of mineral production was less in 2008 than in 2007, a consequence of the decline in metals prices. Production values for 2008 were $2,427.1 million compared to $3,367.0 million in 2007, a 28 percent decline. However, 2008 was still the seventh consecutive year with production value above $1 billion. Higher gold production was noted, but silver, zinc, and lead production declined. Zinc accounted for 43.5 percent of the total production value, followed by gold at 28.8 percent. Red Dog Mine was the largest mineral producer in Alaska during 2008, with 54.5 percent of the production value. Other significant producers, in order of value of product, were Pogo Mine (12.5 percent), Greens Creek Mine (12.3 percent), and Fort Knox Mine (11.8 percent). International mineral exports from all companies were valued at $853 million.

Zinc production was 626,135 tons in 2008. Lead production was 153,705 tons. Gold production was 800,752 ounces and silver production was 14.6 million ounces. Sand and gravel production was 12.5 million tons and rock production was 2.5 million tons. More than 1.5 million tons of coal were produced. Peat production was 83,789 cubic yards.

Hard-rock (lode) gold production increased approximately 10.5 percent in 2008 to 743,993 ounces. Pogo Mine replaced Fort Knox Mine as the largest gold producer in Alaska. Placer gold production increased in 2008 by 5.4 percent to 56,759 ounces from 53,849 ounces in 2007. There were approximately 195 placer operations that reported production in Alaska in 2008 compared to 174 in 2007.

Rock Creek Mine began gold production in September. The mill operated episodically until November 24, when production was suspended to conserve cash flow. Operations at Rock Creek Mine were halted because of unanticipated mechanical problems, challenges in meeting additional environmental requirements, uncertainty of anticipated project cash flow, and uncertainty of financing during the severe prevailing credit and equity market conditions at that time. The mine is currently in care and maintenance status.

Major drilling programs were conducted during all phases of mining (exploration, development, and production) on various projects in most areas of the state in 2008. Totals for 2008 included 874,634 feet of core drilling, 250,278 feet of reverse-circulation drilling, 26,869 feet of core and reverse-circulation drilling on coal operations, and 1,216 feet of placer churn/auger drilling. About 45 percent of the 2008 drilling footage was from exploration and development projects in the eastern interior region of Alaska and 27 percent of the drilling footage for 2008 was from exploration projects in southwestern Alaska. The Pebble Limited Partnership had the largest drill program in Alaska during the year, with more than 175,500 feet of core drilling on the Pebble property. Fairbanks Gold Mining Inc. (Kinross Gold Corp.) had the largest reverse-circulation rotary drill program, with drilling related to development and exploration work at Fort Knox Mine and adjacent properties. BHP Billiton Ltd. had the largest coal drilling program.

Alaska Division of Geological & Geophysical Surveys (DGGS) mapped and sampled in the eastern Bonnifield mining district and along part of the Alaska Highway portion of the proposed gas pipeline corridor between Dot Lake and Tetlin Junction.

The State of Alaska, through DGGS, funded and acquired airborne magnetic and electromagnetic geophysical surveys to complete the 710-square-mile Styx River survey area in the northeastern Lime Hills and northwestern Tyonek quadrangles; they also acquired airborne magnetic and electromagnetic geophysical surveys for the Slate Creek–Slana River area, in the Chistochina mining district east of Paxson.

The Alaska Industrial Development and Export Authority (AIDEA) expanded the Skagway Port facility for storing and shipping mineral concentrates. The Alaska Railroad transported 2.83 million tons of gravel and more than 600,000 tons of coal during 2008. Mineral products (coal, sand, and gravel) generated revenue amounting to $18.5 million.

Five draft ballot “citizen initiatives” that potentially would have negatively impacted the Alaska mineral industry were certified and gathered support signatures during late 2007 and 2008. One of these initiatives, 07WTR3, “The Alaska Clean Water Initiative (III),” was placed on the August 26 ballot after rulings by the Alaska Supreme Court. The ballot measure failed by a margin of more than 14 percent, after a lengthy, contentious advertising campaign by groups on both sides of the issue, resulting in the most expensive initiative process in Alaska history.

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Alaska's Mineral Industry 2008

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

INTRODUCTION

Alaska is strategically located along the Pacific Rim with favorable access to worldwide shipping routes. Alaska mining laws provide for nonexclusive access to State-owned lands for prospecting, an exclusive right to develop a discovery, and security of tenure. The State of Alaska also offers a state-sponsored geological and geophysical mapping effort, a reasonable permitting process, capable workforce, exploration incentives, and government programs financing large-scale and long-term infrastructure projects. More than 190 million acres of federal, state, and Native lands are open for mineral-related activities and mining. It is the policy of the State of Alaska to encourage responsible development of its land and resources by making them available for maximum use consistent with the public interest.

The total value of Alaska's mineral industry in 2008 was $3.171 billion, $844 million and 21 percent lower than 2007's record value of $4.015 billion. The decline in total value was primarily due to lower metal prices, increased operating costs, and a worldwide economic slowdown. Table 1 shows the estimated annual value of the mineral industry in Alaska between 1981 and 2008, divided between exploration and development investments, and the gross value of the mineral products. This total value, although it is a combination of expenses and receipts, is an effective way of tracking the annual strength of the mineral industry. The year 2008 was the thirteenth consecutive year with a total value above $1 billion, the third consecutive year with a total value more than $3 billion, and the seventh consecutive year with production value above $1 billion.

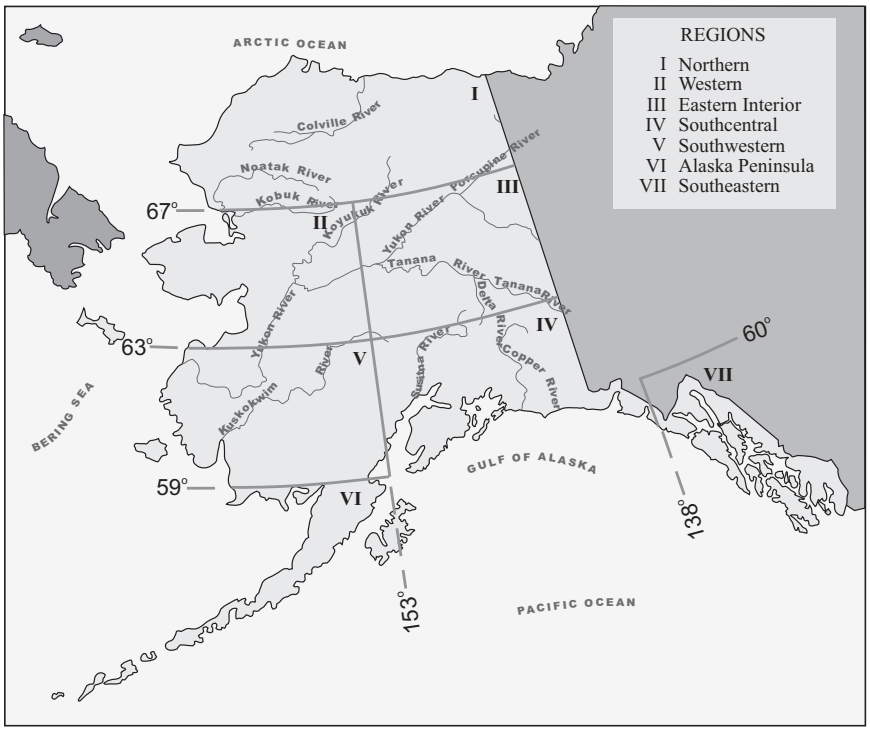


Figure 1. Regions of mineral activity as described in this report.

[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.

Exploration activities for a wide variety of commodities continued across all regions of Alaska, and new discoveries were announced. Exploration expenditures were $347.3 million in 2008, more than $18 million higher than the record $329.1 million spent in the previous year. The year 2008 was the second consecutive year with expenditures above $300 million and the fourth consecutive year with expenditures of more than $100 million. Development expenditures for 2008 were $396.2 million, a 24.3 percent increase over the $318.8 million spent in 2007 and sustaining development expenditures in excess of $200 million for a fifth year. Mineral production volumes remained strong; however, the value of mineral production was less in 2008 than in 2007 following the decline in metals prices. Production values for 2008 were $2,427.1 million compared to $3,367.0 million in 2007, a decline of 28 percent.

Figure 1 shows the regions of the state as defined for this report. Table 1 and figure 2 show the estimated value of the mineral industry in Alaska per year between 1981 and 2008, divided between exploration and development investments, and the gross value of mineral products. Company information is generally used to derive the exploration and development values. 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

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

Year	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
2007	329.1	318.8	3,367.0	4,014.9
2008	347.3	396.2	2,427.1	3,170.6
TOTAL	**$1,889.4**	**$3,721.7**	**$23,977.7**	**$29,588.8**

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

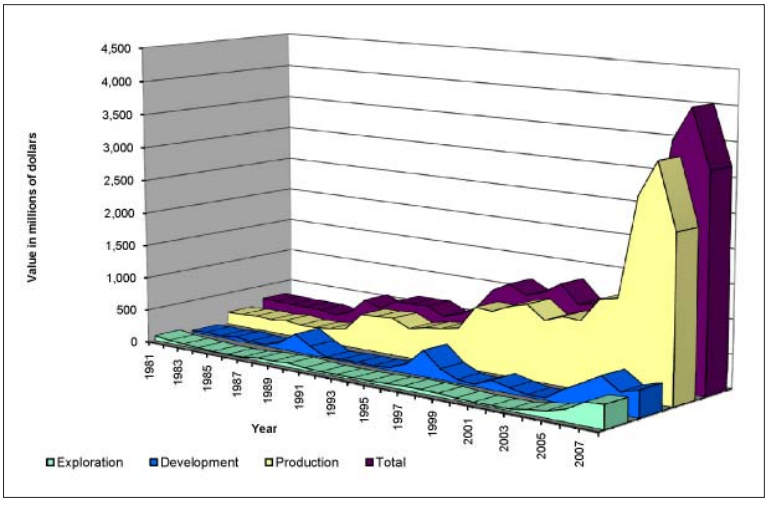


Figure 2. Alaska's mineral industry total value, 1981–2008.

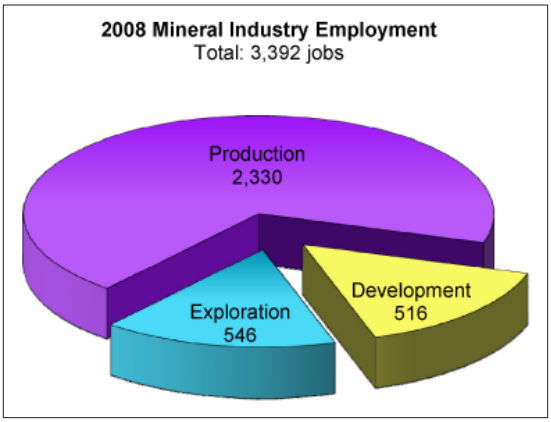
changed compared to previous editions of this report, reflecting changes in data collected and accounting practices by the mining industry. Whenever possible, the authors have worked to maintain consistency of data for seamless year-to-year comparisons. Most changes are noted in footnotes in the affected tables.

This report of Alaska's mineral industry activity for 2008 is the 28th in the series of annual reports, and is made possible by information provided through press releases, company annual and financial reports, phone interviews, other research, and replies to questionnaires mailed and emailed by the Alaska Division of Geological & Geophysical Surveys (DGGS). This report is part of a cooperative effort between DGGS and the Office of Economic Development in the Department of Commerce, Community and Economic Development (Commerce). Commerce provides the funding to print the report. Information in this report supersedes data previously published in DGGS Information Circular 58, Alaska's mineral industry 2008: A summary.

EMPLOYMENT

Figure 3 displays employment within various segments of Alaska's mineral industry. Table 2 lists estimated employment in the Alaska minerals industry for the past eight years and figure 4 shows the trends in that employment for the past ten years. Total minerals industry employment in 2008 is estimated to be 3,392 full-time-equivalent jobs, a decrease of 166 jobs (4.6 percent) from the estimated 2007 total of 3,558 full-time-equivalent jobs. The largest change in employment compared to 2007 was the drop in mineral development jobs from 735 to 516, a 30 percent decrease. Full-time-equivalent jobs also decreased in the lode gold, recreational mining, sand and gravel, rock, and peat sectors. There was a significant increase in the number of reported placer gold jobs, however, possibly reflecting the high price of gold throughout most of the year. Modest employment increases were seen in the polymetallic, base metals, and coal mining sectors, and the exploration employment sector.

Figure 3. 2008 mineral industry employment in Alaska by category.



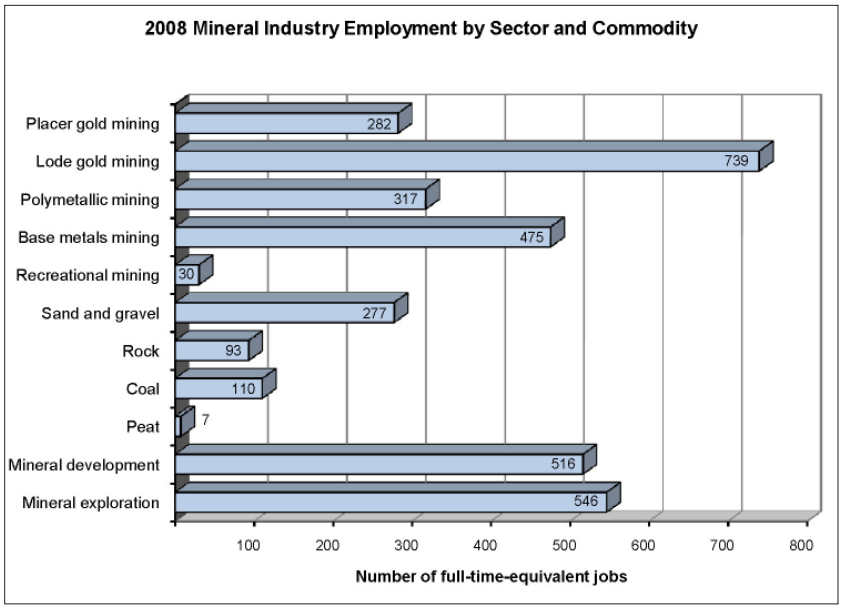


Table 2. Estimated Alaska mine employment, 2000–2008[a].

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Gold/silver mining									
Placer	470	176	148	82	64	86	242	208	282
Lode	274	337	413	325	433	411	704	808	739
Polymetallic mining	275	275	262	295	265	250	245	276	317
Base metals mining	556	559	580	388	508	449	457	457	475
Recreational mining	250	210	180	175	175	175	45	54	30
Sand and gravel	603	556	702	349	567	400	337	284	277
Rock	150	137	177	35	475	148	104	124	93
Coal	121	121	100	65	90	95	95	102	110
Peat[b]	36	32	21	20	4	6	11	11	7
Tin, jade, soapstone, ceramics, platinum	20	20	20	20	- -	- -	- -	- -	- -
Mineral development	345	333	135	64	283	498	848	735	516
Mineral exploration	83	79	86	88	184	303	435	499	546
TOTAL	**3,183**	**2,835**	**2,824**	**1,906**	**3,048**	**2,821**	**3,523**	**3,558**	**3,392**

[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.

The average monthly wage for mining in Alaska during 2008 was $7,472, according to the Alaska Department of Labor & Workforce Development (DLWD), compared to an average monthly wage for all industries in Alaska of $3,779. The agency reported that the average employment in mining was 2,118 jobs during 2008, with total employment in all industries in Alaska during 2008 estimated at 321,724 full-time-equivalent positions. Mining employment was reported in most regions of Alaska, with 598 jobs in the Fairbanks North Star Borough, 89 jobs in the Anchorage municipality, and 23 jobs in the Kenai Peninsula Borough. Mining jobs were not separated from oil and gas extraction and mining support activities in other areas reported by DLWD.

The average monthly wage for metal mining in Alaska during 2008 was $7,684, according to the DLWD. They also report that the average employment during 2008 was 1,887 full-time-equivalent jobs in metal mining, 231 in coal mining and nonmetallic mineral mining and quarrying, and 9,521 in support activities for mining, oil, and gas. Nonmetallic mineral product manufacturing provided 342 jobs, and cement and concrete manufacturing provided an average of 328 jobs for 2008. Primary metal manufacturing provided 31 full-time-equivalent jobs, while metal and mineral merchant wholesalers provided an average of 115 jobs during 2008. 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.

The Alaska mining industry also created an estimated 2,000 indirect jobs, according to a 2008 study prepared for the Alaska Miners Association Inc. by the McDowell Group Inc. Mining companies strengthen Alaska's local economies by employing Alaska residents from more than 120 Alaska communities, and purchasing supplies and services from hundreds of Alaska businesses.

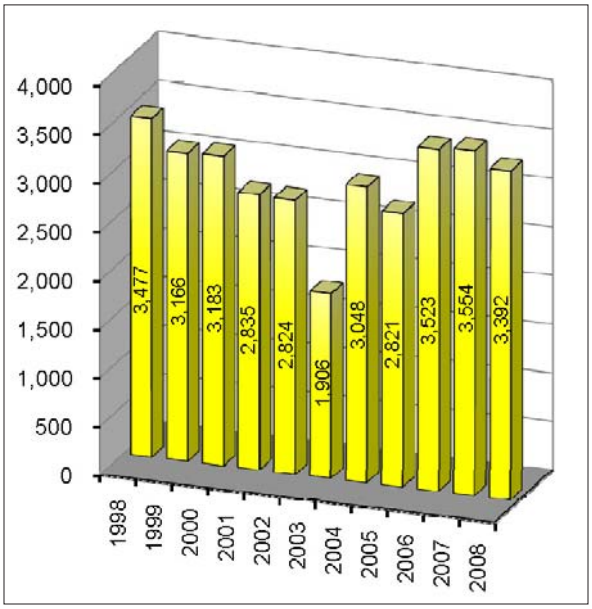


Figure 4. Total mineral industry employment in Alaska from 1998 to 2008.

GOVERNMENT REVENUES FROM ALASKA'S MINERAL INDUSTRY

Revenues are paid to the State by the minerals industry through a number of instruments. Those instruments include State claim rentals; production royalties; annual labor; coal land rentals; coal royalties; material (rock, sand, and gravel) sales from State and Mental Health and State Pipeline Coordinator's Office managed lands; miscellaneous fees; state fuel taxes; corporate income taxes; and mining license taxes. Municipalities also receive revenues from the minerals industry for property taxes, payments in lieu of taxes (PILT), severance taxes, and sales taxes. The total revenues paid to the state and municipalities for 2008 amounted to $96.1 million, down considerably from the $158.6 million paid in 2007. This reduction in payment is due to lower net income from the mining industry and decreasing property values. See table 3 for an itemized listing of revenues paid.

State mineral rents and royalties amounted to $6,629,451 during 2008 compared to $7,310,048 for 2007. Details of the payments by item are shown in table 3. The State of Alaska mining laws grant the holder of a mining claim exclusive right to the locatable minerals in the ground covered by that mining claim. State mining claims have recording, rental, and other fees associated with them. Mining claim location certificates and recording fees must be recorded in the recording district office in which the claim is located within 45 days of the posting date. Recording fees change from time to time and the recording office should be contacted for the correct fee; recording fees are also posted at the following web site address: www.dnr.state.ak.us/ssd/recoff/fees.cfm. Rental fees under regulation 11 AAC 86.215 are as shown in table 4, and must be paid according to the instructions on the back of the certificate form. The first rental payment covers the period from the date of posting the claim to the following September 1st. Annual labor must be performed on a mining claim each year. The annual lease rate for coal properties is $3.00 per acre. The rental payments may be credited against royalties to the extent that they do not exceed the royalties.

In 1989, the Alaska State Legislature enacted a new production royalty law, Alaska Statute 38.05.212, which requires holders of state mining locations to pay a production royalty on all revenues received from minerals produced on state land. The production royalty requirement applies to all revenues received from minerals produced from a state mining claim or mining lease during each calendar year. Payment of royalty is in exchange for and to preserve the right to extract and possess the minerals produced. The production royalty is 3 percent of the net income as determined under the Mining License Tax Law AS 43.65, and regulation 15 ASC 65. Department of Natural Resources regulations 11 AAC 86.760–796 spells out the production royalty requirements.

The state sells rock, sand, and gravel from its lands at a prescribed rate for use in construction. Lands involved in those sales include Mental Health, Division of Lands and State Pipeline Coordinator's Office (SPCO). Sales of these materials generated $3,038,078 during 2008 compared to $2,697,701 during 2007. Other common variety minerals that could be involved in this category include riprap, limestone, slate, peat, and any other substances from the ground that are not designated through the location system for mining claims (for example, gold, silver, and other metals), or leasing (for example, energy minerals such as coal, oil, and gas). Materials are measured and sold in cubic yards. The price charged for materials depends on the type, or size, of sale, but prices are based on a competitive or fair market price of material in the area. Contact the DNR information office for further information.

Claim and leaseholders on state land are assessed miscellaneous fees; these amounted to $87,889 for 2008 compared to $100,999 for 2007. Miscellaneous fees are segregated in table 3 and comprise filing fees, penalties, exploration incentive application fees, bond pool payments, surface coal mining application fees, and Annual Placer Mining Application (APMA) fees.

Fuel tax collected by the State for 2008 amounted to $428,214 compared to $726,563 during 2007; these numbers were collected from mining companies and are not entirely complete. The motor fuel tax was suspended for one year on September 1, 2008. The motor fuel tax is $0.08/gallon and is collected for all fuel for mining operations. Fuel used for heating and stationary power plant is not taxable and application for refund of the full amount may be made to the State of Alaska. Off-highway fuel use for equipment and vehicles, mobile power plants, pumps, and unlicensed vehicle operation is partially refundable at the rate of $0.06/gallon of gasoline or diesel fuel. In the case of diesel fuel, individual pieces of equipment must be identified by description, serial number, purpose, and gallons used. Refund forms are available at http://www.tax.alaska.gov/programs/programs/forms/index.aspx?60210 and click on "Claim for Refund Template."

The Mining License Tax was established by statute (AS 43.65) to collect taxes on net income from mining operations after a 3.5 year initial production grace period provided to taxpayers to help return their initial investment. The rates on mining net income are as follows: No tax if net income is $40,000 or less; $1,200 plus 3 percent if over $40,000; $1,500 plus 5 percent if over $50,000; and $4,000 plus 7 percent if over $100,000. The total Mining License Tax collected for 2008 was $16,044,139,

Table 3. Revenues paid to the State of Alaska and municipalities by Alaska's mineral industry, 2003–2008.

	2003	2004	2005	2006	2007	2008
State mineral rents and royalties[a]						
State claim rentals	$ 2,129,440	$ 2,657,939	$ 3,308,752	$ 3,460,803	$ 4,649,795	$ 3,082,071
Production royalties[b]	270,734	162,637	124,338	171,220	800,548	1,518,622
Annual labor	224,519	226,191	332,439	155,007	163,279	380,169
Subtotal	**$ 2,624,693**	**$ 3,046,767**	**$ 3,765,529**	**$ 3,787,030**	**$ 5,613,622**	**$ 4,980,862**
State coal rents and royalties						
Rents	$ 237,912	$ 236,532	$ 257,112	$ 337,764	$ 253,376	$ 248,841
Royalties[b]	1,064,208	1,239,257	1,476,250	1,473,948	1,443,050	1,399,748
Bonus	0	0	129,880	10	0	0
Subtotal	**$ 1,302,120**	**$ 1,475,789**	**$ 1,863,242**	**$ 1,811,722**	**$ 1,696,426**	**$ 1,648,589**
State material Sales						
Mental Health	$ 134,512	$ 76,267	$ 129,409	$ 89,634	$ 24,835	$ 37,734
Division of Land	542,311	467,360	944,905	1,582,769	2,615,810	2,818,107
SPCO	208,309	112,047	46,877	118,904	57,056	182,237
Subtotal	**$ 885,132**	**$ 655,674**	**$ 1,121,191**	**$ 1,791,307**	**$ 2,697,701**	**$ 3,038,078**
State mining miscellaneous fees						
Filing fees	$ 4,700	$ 1,300	$ 8,465	$ 965	$ 1,750	$ 2,750
Penalty fees	0	26,110	20,280	46,249	24,005	18,876
Explore incentive app filing fee	0	0	0	0	0	0
Bond pool payment	44,878	35,426	32,331	36,721	43,909	39,429
Surface coal mining app fee	1,005	3,116	3,150	10,897	10,458	3,023
APMA mining fees	15,113	14,550	17,131	17,475	20,877	23,811
Subtotal	**$ 65,696**	**$ 80,502**	**$ 81,357**	**$ 112,307**	**$ 100,999**	**$ 87,889**
AIDEA - Facilities use fees	$16,087,000	$15,730,000	$15,607,000	$ 15,476,000	$ 16,218,000	$16,190,000
State Fuel Taxes					$ 726,563	$ 428,214
State corporate income tax[c]	$ 406,064	$ 2,104,144	$23,641,883	$ 71,299,684	$ 61,331,540	$41,081,549
Mining License Tax[d - f]	$ 3,224,684	$10,317,238	$18,637,996	$ 79,141,526	$ 54,408,227	$16,044,139
State Total	**$24,595,389**	**$33,410,114**	**$64,718,198**	**$173,419,576**	**$142,793,078**	**$83,499,320**
Payments to Municipalities	$10,510,048	$10,999,663	$11,975,892	$ 14,388,329	$ 15,827,501	$12,599,399
TOTAL	**$35,105,437**	**$44,409,777**	**$76,694,090**	**$187,807,905**	**$158,620,579**	**$96,098,719**

[a]Includes upland lease and offshore lease rentals.
[b]Reported on a cash basis - payments actually received during the given year.
[c]Preliminary data for 2008 - reported on an accrual basis.
►Only subchapter C corporations pay income tax.
►This report may not reflect 100% of the returns received in a year.
►Data from 2003 through 2007 has been updated to reflect revenue to the state for the succeeding fiscal year; ex.: FY 07 receipts are shown in calendar year 2006.
[d]Includes metals, coal and material.
[e]Mining license tax has been adjusted to reflect actual receipts for the succeeding fiscal year for the period 2003 to 2008; see note for income tax above.
[f]2008 numbers are preliminary and are subject to revision.

Table 4. Alaska state annual claim rental rates by size and maturity. Rental rates are subject to adjustment in 2009 in accordance with the Consumer Price Index for Anchorage as prescribed by statute AS 38.05.211.

Years Since Location	Rental Per Quarter Section Size Claim	Rental Per Quarter–Quarter Section Size Claim	Rental for Traditional Size Claim (40 Acres) or Leasehold
0–5	$100	$25	$25
6–10	220	55	55
11 or more	520	130	130

compared to $54,408,227 for 2007. Mining License Tax returns are confidential and cannot be reported by individual/entity.

Corporate income taxes are assessed on all corporations having net income in the state. The corporate income taxes collected by the state during 2008 from mining operations amounted to $41,081,549, compared to $61,331,540 for 2007. Corporate income taxes are confidential and can't be reported by individual corporation. The corporate income tax rate is set by statute and is shown in table 5.

Annual revenues to the State of Alaska and municipalities from mineral-industry-specific fees, rent, sales, and royalties, and taxes are shown in figure 5.

Mining companies were the largest taxpayers in the City and Borough of Juneau and the Fairbanks North Star, Denali, and Northwest Arctic boroughs. Teck-Pogo Inc. also paid the City of Delta Junction $500,000 as part of a payment in lieu of taxes (PILT) agreement in 2008. The Alaska Industrial Development & Export Authority (AIDEA) was paid annual user fees of $16.2 million for use of the State-owned road and port, the DeLong Mountain Regional Transportation System, by Teck Cominco Alaska Inc., operator of the Red Dog Mine, and for use of the Skagway Ore Terminal by Minto Explorations Ltd., subsidiary of Capstone Mining Corp. (formerly Sherwood Copper Corp.).

Table 5. State corporate income tax rate.

Net Income	Base Tax	Plus %	Of Excess Over
<$10,000	$ -	1	$ -
10,000–20,000	100	2	10,000
20,000–30,000	300	3	20,000
30,000–40,000	600	4	30,000
40,000–50,000	1,000	5	40,000
50,000–60,000	1,500	6	50,000
60,000–70,000	2,100	7	60,000
70,000–80,000	2,800	8	70,000
80,000–90,000	3,600	9	80,000
>$90,000	4,500	9.40	90,000

ACKNOWLEDGMENTS

This report on Alaska's 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 and emailed more than 700 questionnaires in December 2008 and continued sending additional questionnaires through 2009. We received 133 responses and followed questionnaire requests with phone calls and other means of contact. Dave Szumigala (DGGS) and Rich Hughes (Commerce) prepared the body of the text, tables, graphic illustrations, and appendices with information supplied by many individuals. Some photos and images used in this report were provided by members of the public; these contributions are greatly appreciated. Where appropriate, these people have been acknowledged in the text. Information and text previously compiled for DGGS Information Circular 58 were used extensively.

The cover design is by Joni Robinson (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.

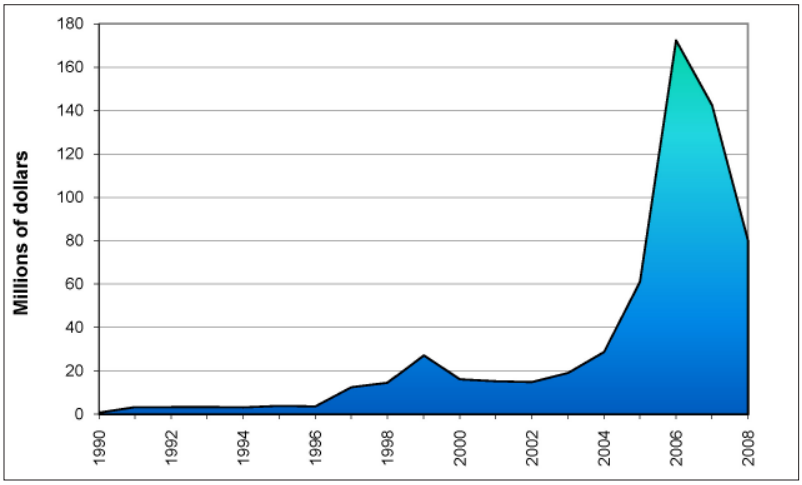


Figure 5. Mining industry revenue to State of Alaska and municipalities from 1990 to 2008.

EXPLORATION

Exploration expenditures in Alaska during 2008 are estimated to be $347.3 million, a 5 percent increase from the $329.1 million spent in 2007. Figure 6 shows the location of the most significant exploration projects in Alaska during the year. At least 74 exploration projects in Alaska recorded expenditures of more than $100,000 each and 35 of those projects spent more than $1 million each. Approximately 90 percent of the exploration funds spent in Alaska during 2008 were from Canadian sources; almost 7 percent of funds were from overseas sources.

Increased exploration expenditures in Alaska during 2008 ran counter to worldwide exploration expenditures, with most jurisdictions experiencing a drop in exploration expenditures from 2007 to 2008. Exploration spending in Alaska dropped noticeably in the third quarter of 2008, with some projects postponing major expenditures like drilling as the worldwide financial crisis starting affecting financial markets.

Figure 7 shows a graph of mineral exploration expenditures in Alaska from 1956 to 2008. Exploration expenditures per year are shown with raw (not adjusted for inflation) and adjusted values (inflation adjusted to 2008 dollars). Exploration expenditures over the last several years have exceeded any previous era of mineral exploration in Alaska during the past 50 years. Companies explored for a wide variety of mineral deposits in Alaska during 2008. Table 6 lists exploration expenditures by commodity while figure 8 shows the data graphically.

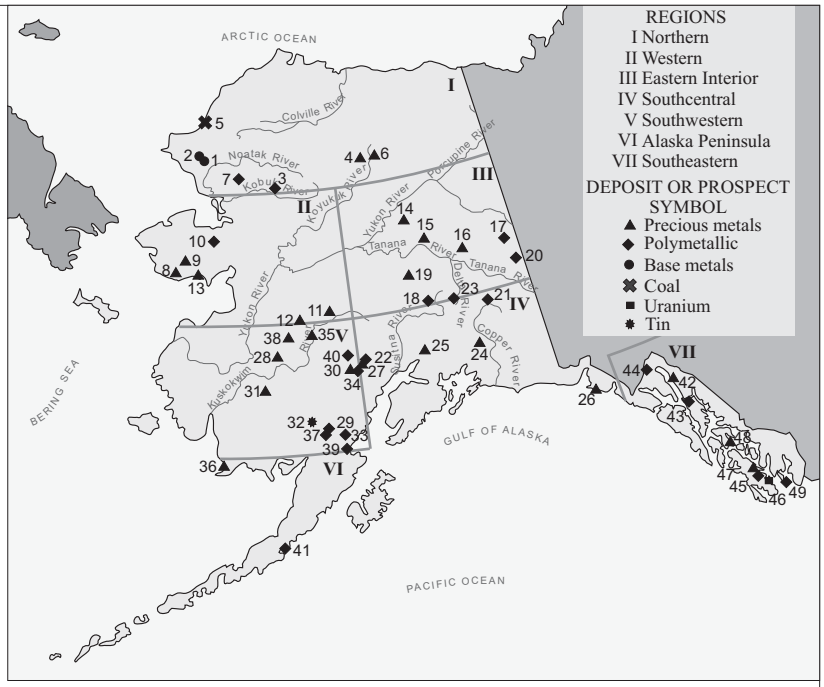
Exploration was conducted in Alaska for a wide variety of metals and mineralization styles during 2008. Record exploration expenditures were set for polymetallic deposits in 2008. Gold, grouped with other precious metals, remained a major exploration commodity, but exploration expenditures for deposits with a mixed group of metals (polymetallic) were also very strong. Platinum-group-element (PGE) exploration expenditures in 2008 were significantly above the average PGE expenditures from 2001 to 2007. Figure 9 shows 2008 Alaska exploration expenditures by deposit type. Copper–gold porphyry systems (grouped with polymetallic deposits in table 6) were the major exploration target in 2008, with slightly more than $163 million spent. More than $95.5 million was spent on intrusion-related gold deposits and more than $35.7 million was spent on various gold–quartz vein deposits. The sharp decrease in exploration expenditures for base-metal-rich, polymetallic massive-sulfide deposits was notable, with $30.1 million spent in 2008, compared to almost $59.4 million spent in 2007 and $18.8 million spent in 2006 and $10.0 million spent in 2005. About $3.2 million was spent on PGE–nickel–copper ultramafic-hosted deposits and almost $19.6 million was spent on uranium, diamond, tin, coal, placer gold, and other deposit types, including significant expenditures exploring for iron–titanium-rich beach placer deposits.

Exploration occurred across Alaska, as shown in table 7, but more than $228 million (or 65 percent of the exploration funds) were spent in southwestern Alaska (fig. 10). The southcentral region saw a sharp increase in exploration spending compared to 2007. Exploration expenditures dropped sharply in the northern region during 2008 compared to 2007; moderate decreases occurred in the western, eastern Interior, and southeastern regions.

Two advanced exploration projects, Pebble and Donlin Creek, accounted for more than 60 percent of the exploration expenditures and drill footage in 2008. The Pebble copper–gold porphyry project in southwestern Alaska, with resources of 72 billion pounds of copper, 94 million ounces of gold, and 4.8 billion pounds of molybdenum, is a joint-venture project of Northern Dynasty Minerals Ltd. and Anglo American PLC, and was the largest exploration project in 2008. The 31.7-million-ounce Donlin Creek intrusion-hosted gold project in southwestern Alaska is a joint venture of Barrick Gold Corp., NovaGold Resources Inc., and Calista Corp.

Table 8 summarizes the number of new and active (new plus existing) mining claims per year, from 1991 to 2008. The table lists the number of 20-acre federal mining claims, 160-acre state prospecting sites, and 40- or 160-acre state mining claims. During 2008, 3,898 new state mining claims (459,625 acres), 24 new state prospecting sites (3,840 acres), and 3,001 new federal claims (60,020 acres) were staked. State claim staking decreased more than 50 percent from 2007 levels, while the number of new federal mining claims more than tripled from 2007 to 2008. The number of active federal claims reached its highest level in 16 years during 2008. The amount of land in Alaska under claim decreased approximately 13 percent from 2007 to 2008, with approximately 4.31 million acres of land covered by claims and prospecting sites in 2008. Alaska had 11,732 active federal and 44,392 active state mining claims in 2008.

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 2008. Alaska Gold Co., a subsidiary of NovaGold Resources Inc., staked 500 more 160-acre state mining claims covering 78,560 acres on the Seward Peninsula in the vicinity of the Darby Mountains and



I Northern Region

1. Red Dog Mine—Teck Cominco Alaska Inc.
2. Lik-Su—Zazu Metals Corp.
3. Ambler Project—NovaGold Resources Inc.
4. Nolan Creek Mine—Silverado Gold Mines Ltd.
5. Western Arctic Coal—BHP Billiton Ltd.
6. Little Squaw Mine—Goldrich Mining Co.
7. Baird Mountain Project—NovaGold Resources Inc.

II Western Region

8. Rock Creek, Big Hurrah—NovaGold Resources Inc.
9. Divide—Alix Resources Corp./Millrock Resources Inc.
10. Kugruk—NovaGold Resources Inc.
11. Nixon Fork Mine—St. Andrew Goldfields Ltd.
12. Ganes Creek—Great Basin Gold Ltd.
13. Bluff—Millrock Resources Inc.

III Eastern Interior Region

14. Livengood—International Tower Hill Mines Ltd.
15. Fairbanks District
    a. Fort Knox, Gil & District—Kinross Gold Inc.
    b. Golden Summit—Freegold Ventures Ltd.
16. Pogo—Goodpaster mining district
    a. Pogo—Teck Cominco Alaska Inc.
    b. LMS—International Tower Hill Mines Ltd.
    c. Maple Leaf, California North, ER–Ogo–Fire—Rubicon Minerals Corp.
    d. Rob—Freegold Ventures Ltd.
    e. Mon—Sumitomo Metal Mining/Stone Boy Inc./Pathfinder Mineral Services
    f. Ogopogo—Copper Ridge Explorations Inc.
17. Fortymile— Full Metal Minerals Ltd.
18. Gold Hill—Max Resource Corp.
19. Liberty Bell—New Gold Inc.
20. Taurus—Senator Minerals Ltd.

IV Southcentral Region

21. Chisna—International Tower Hill Mines Ltd.
22. Whistler—Geoinformatics Exploration Inc.
23. MAN—Pure Nickel Inc.
24. Tonsina—Pacific North West Capital Corp.
25. Lucky Shot—Full Metal Minerals Ltd.
26. Yakutat—Geohedral LLC
27. South Estelle—Millrock Resources Inc.

V Southwestern Region

28. Donlin Creek—Donlin Creek JV
29. Pebble—Northern Dynasty Minerals Ltd./Anglo American PLC
30. Terra—International Tower Hill Mines Ltd.
31. Tintina Gold—NovaGold Resources Inc.
32. Sleitat—Brett Resources Inc.
33. Bristol Bay—Alix Resources Corp./Andover Ventures Inc.
34. Styx River—Anglo American Exploration (USA) Inc.
35. Vinasale—Freegold Ventures Ltd.
36. Goodnews Bay—Pacific North West Capital Corp./Stillwater Mining Co.
37. Pebble South—Freeport–McMoRan Exploration Corp./Full Metal Minerals Ltd.
38. Moore Creek—Highbury Projects Inc./Full Metal Minerals Ltd.
39. Kamishak—Alix Resources Corp.
40. BMP—International Tower Hill Mines Ltd.

VI Alaska Peninsula Region

41. Mallard Duck Bay/Chignik—New Gold Inc.

VII Southeastern Region

42. Kensington, Jualin—Coeur Alaska Inc.
43. Greens Creek Mine—Hecla Mining Co.
44. Palmer—Constantine Metal Resources Ltd.
45. Niblack—Niblack Mining Corp.
46. Bokan Mountain—Ucore Uranium Inc./Landmark Minerals Inc.
47. CJ—Altair Ventures Inc./Full Metal Minerals Ltd.
48. Woewodski Island—Bravo Venture Group Inc./Olympic Resources Group LLC
49. Duke Island—Quaterra Resources Inc.

Figure 6. Selected exploration projects in Alaska, 2008.

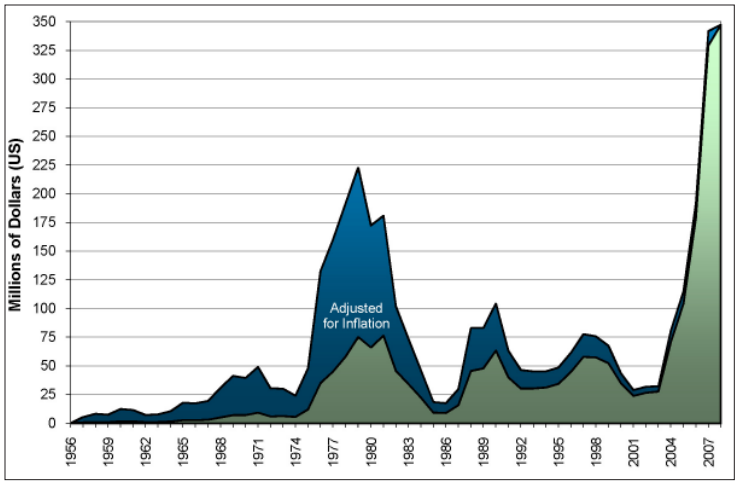


Figure 7. Alaska mineral exploration expenditures, 1956–2008. Inflation adjusted to 2008 dollars.

Table 6. Reported exploration expenditures in Alaska by commodity, 1981–2008.

	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	5,069,000	81,073,000	89,793,000	20,000	2,394,000	580,000	178,929,000
2007	38,888,000	123,487,500	155,601,400	42,500	7,675,000	3,447,000	329,141,400
2008	30,116,000	163,030,000	134,885,000	- -	W	19,238,000	347,269,000
TOTAL	**$203,369,766**	**$559,362,661**	**$1,050,230,343**	**$15,559,000**	**$29,347,750**	**$31,448,900**	**$1,889,318,420**

[a]Polymetallic deposits considered a separate category for the first time in 1992.
[b]Approximately $3.2M spent on platinum-group-element exploration during 2008 ($3.0M in 2007, $1.4M in 2006, $4.4M in 2005,$3.4M in 2004, $2.4M in 2003, $650,000 in 2002, $2M in 2001).
[c]Includes uranium, tin, diamonds, magnetite sands, and tantalum.
N/A = Not available.
- - Not reported.
W = Withheld; data included in "Other" column.

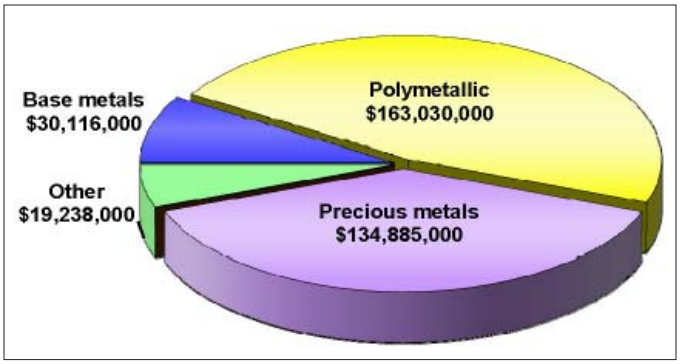


Figure 8. Exploration expenditures in Alaska in 2008 by commodity.

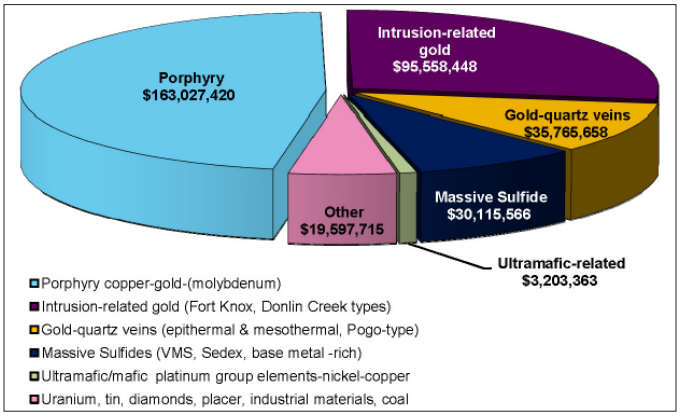


Figure 9. 2008 Alaska exploration expenditures by deposit type.

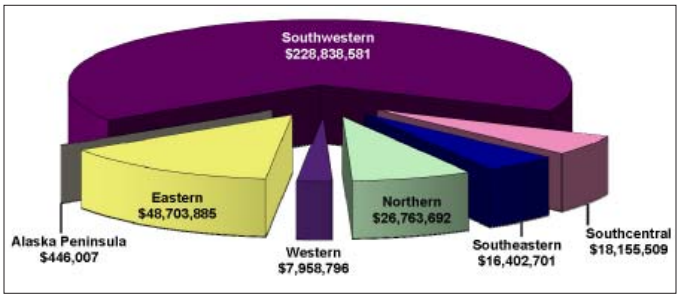


Figure 10. 2008 Alaska exploration expenditures by region.

Table 7. Reported exploration expenditures and employment in Alaska, 2008.

	Northern	Western	Eastern interior	South-central	South-western	South eastern	Alaska Peninsula	Total
				Exploration expenditures				
Placer	$ 153,380	$ 40,174	$ 143,800	$ 17,819	$ -	$ 2,600	$ -	$ 357,773
Lode	26,610,312	7,918,622	48,560,085	18,137,690	228,838,581	16,400,101	446,007	346,911,397
TOTAL	**$26,763,692**	**$7,958,796**	**$48,703,885**	**$18,155,509**	**$228,838,581**	**$16,402,701**	**$446,007**	**$347,269,170**
				Exploration employment				
Employment workdays	35,107	3,689	20,769	3,276	72,525	6,305	344	142,015
Workyears[a]	135	14	80	13	279	24	1	546
Companies reporting[b]	10	10	36	10	26	13	2	107

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

Table 8. Summary of claim activity by acres, 1991–2008.

Year	State Claims				State Prospecting Sites		Federal Claims	
	New (Active) 40 acre[a]	New (Active) 160 acre	Total (Active) 40 acre[a]	Total (Active) 160 acre	New	Total	New	Total
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	7,826[b]
2006	1,111	5,747	33,864	16,249	103	1,646	457	8,068[b]
2007	576	6,031	31,305	20,208	57	1,625	933	8,872[b]
2008	1,333	2,565	U	U	24	651	3,001	11,732

Updated information provided by James McJimsey (Land Records Information Section, DNR), and Melody Smyth and Julie Capps (USBLM). Table has been reorganized to conform with computer records available after 1990.

[a]Includes claim fractions varying from 1 to 39 acres.

[b]Corrected.

U - Unknown, data not available at this time.

west of Candle in the Koyuk–Kugruk drainages. Geohedral LLC staked 2,383 federal mining claims in the Yakutat area. Barrick Gold Exploration Inc. staked one hundred and thirty four 160-acre state mining claims in the Granite Creek area of the Iditarod Quadrangle. Anglo American Exploration (USA) Inc. staked one hundred and fifty six 160-acre state mining claims in the Styx River area of the Alaska Range.

NORTHERN REGION

Teck Cominco Alaska Inc. continued its exploration drilling program for polymetallic sedimentary-hosted massive sulfide deposits in the area surrounding Red Dog Mine. Teck drilled 29,000 feet of core in 12 holes. Drilling results were not released. Teck also continued an exploration program for a local source of natural gas near the Red Dog Mine. Teck has spent $10.8 million to date on their energy exploration program.

BHP Billiton Ltd. completed a second year of exploration at the Western Arctic Coal Project drilling under a 5-year exploration agreement with Arctic Slope Regional Corp. The 2008 field program included a caribou monitoring program; mobilization and planned spring caching; significant site improvements, including camp expansion, runway upgrades and ongoing site clean-up; and exploration drilling, field reconnaissance, and baseline environmental activities. Two drills completed 26,869 feet in 20 holes. Drilling results were not released.

Goldrich Mining Co., formerly Little Squaw Gold Mining Co., staked 12 mining claims, completed about 1,000 feet of trenching, collected 160 rock and channel samples for geochemical analysis, conducted limited soil sampling, and completed geologic mapping at the Little Squaw property. Road and airstrip infrastructure was also improved. An independent technical data assessment was commissioned and released. The report summarized the orogenic, mesothermal gold lode potential of the area. The study also concluded that Little Squaw Creek gold-bearing gravels contain a minimum of 216,602 ounces of recoverable placer gold within a global resource of 243,621 ounces. Projected cash operating costs were estimated at $503 per ounce of gold.

Zazu Metals Corp. conducted a 58-hole drill program for a total of 22,406 feet, which included both infill and stepout drilling, at the Lik polymetallic sedimentary-hosted massive sulfide property northwest of the Red Dog Mine. Every hole hit significant sulfide mineralization, with 25 holes having significant mineralized intercepts exceeding 75 feet thick, six holes having

significant mineralized intercepts exceeding 150 feet thick, and 28 holes containing mineralized intercepts exceeding 15 feet thick with zinc plus lead grades greater than 10 percent. The highest grade intercept was in hole DDH-161, with 52.5 feet of mineralization grading 11.25 percent lead, 27.70 percent zinc, and 12.96 ounces of silver per ton from 74- to 126.5-foot depth. The longest intercept was in hole DDH-160, with 215 feet of mineralization from 171- to 386-foot depth grading 2.52 percent lead, 6.26 percent zinc, and 1.10 ounces of silver per ton. Other significant drill results include hole DDH-166 with 32 feet grading 1.84 percent lead, 10.92 percent zinc, and 1.36 ounces of silver per ton; hole DDH-167 with 47 feet grading 1.37 percent lead, 4.32 percent zinc, and 3.94 ounces of silver per ton; and hole DDH-168 with 41.5 feet grading 3.61 percent lead, 7.16 percent zinc, and 1.39 ounces of silver per ton. Zazu also completed a preliminary access study, conducted metallurgical testing, initiated environmental studies, and contracted and completed a ground gravity and pulse electromagnetic (EM) geophysical program. Zazu commissioned G&T Metallurgical Services Ltd. of Kamloops, B.C., to complete early stage metallurgical testing on a 704-pound composite sample from the 2007 drilling program, and engaged Scott Wilson Roscoe Postle Associates Inc. to direct and review the program. Recoveries for zinc were 87 percent into a concentrate grading 52 percent and lead recoveries reached as high as 81 percent into a concentrate grading 57 percent. However, test results indicate that lower lead recoveries of approximately 70 percent would yield a concentrate grade of 70 percent, which would be more marketable to smelters.

NovaGold Resources Inc. released a resource estimate in early 2008, prepared by contractor SRK Consulting Ltd., for the Arctic deposit. The volcanogenic massive sulfide deposit in the southern Brooks Range contains an indicated resource of 18.5 million tons containing 769,000 tons of copper, 1,118,500 tons of zinc, 175,000 tons of lead, 447,000 ounces of gold, and 32.29 million ounces of silver. The deposit contains an additional inferred resource of 13.1 million tons containing 468,500 tons of copper, 656,500 tons of zinc, 105,000 tons of lead, 259,000 ounces of gold, and 18.58 million ounces of silver. NovaGold also continued exploration on the nearby Baird Mountain property.

NovaGold announced in September that it had agreed to sell its interest in the Ambler project, representing up to 51 percent interest, and its early-stage base-metal Alaskan properties, to Mantra Mining Inc. for $20 million in common shares and other conditions. Details of the deal changed due to financial conditions late in the year, with the Ambler property removed from the proposed deal.

Silverado Gold Mines Ltd. drilled 34 holes totaling 11,597 feet at the Workman's Bench prospect on its Nolan Creek property in the Brooks Range (fig. 11). Best results include 0.7 feet grading 2.68 ounces of gold per ton and 5.77 percent antimony in hole 08SH08, 2.1 feet grading 0.04 ounces of gold per ton and 42.07 percent antimony in hole 08SH15, 1.8 feet grading 2.88 ounces of gold per ton and 27.66 percent antimony in hole 08SH18, and 1.0 feet grading 0.08 ounces of gold per ton and 63.47 percent antimony in hole 08SH21. Drilling extended the lateral extent of the stibnite

Figure 11. Drilling by Tricon Mining Inc. on Silverado Gold Mines' Nolan Creek property. Drilling tested gold–antimony mineralization at the Workman's Bench prospect. Silverado purchased its own diamond drill rig in 2007 and drilled NQ size core in 2008 on the Pringle Bench and Workman's Bench prospects. Photo provided by Silverado Gold Mines Ltd.

(antimony)–gold vein systems on Workman's Bench from 600 feet to 1,000 feet. Underground drifting, totaling 570 feet, crosscut gold and antimony veins associated with the Solomon Shear Zone. More than 100 channel samples of bedrock were collected. A 414-pound massive stibnite bulk sample was collected from the Zone A vein. Four large samples of stibnite and gold mineralized rock were collected from a 67-foot length of the main vein in Tunnel D at Nolan Creek Mine. The samples assayed as high as 2.02 ounces of gold per ton and 40.39 percent antimony. A very low frequency-electromagnetic (VLF-EM) ground survey was conducted over approximately 79,000 feet (14.9 line miles) in the Fortress area at the northeast end of the Solomon Shear Zone. Additional strong conductors, coincident with gold–arsenic–antimony soil anomalies, were detected on the "Hillside" part of the Solomon Shear Zone. An inferred mineral resource for the Workman's Bench gold–antimony target estimates 24,090 tons of antimony and gold mineralized rock with an estimated grade of 38.69 percent antimony and 0.446 ounces of gold per ton, which contains 9,321 tons of antimony and 10,737 ounces of gold. A mineral resource for the Nolan Creek placer area included an indicated resource of 66,800 cubic yards containing 6,250 ounces of gold and an inferred resource of 185,670 cubic yards with 6,177 ounces of gold.

Andover Ventures Inc. continued to evaluate results from previous work on the Sun volcanogenic massive sulfide property. Andover plans to complete a resource estimate for the property in the future.

WESTERN REGION

St. Andrew Goldfields Ltd. completed an underground exploration program, including drilling 129 holes totaling 30,777 feet at the past-producing Nixon Fork gold–silver–copper mine near McGrath (fig. 12). Pacific North West Capital Inc. optioned the Nixon Fork property from St. Andrew Goldfields in December, with the right for outright purchase.

Millrock Resources Inc. signed a five-year exploration agreement with Golden Glacier Inc, a subsidiary of Bering Straits Native Corp., for the Council, Bluff, and Ungalik areas of the southern Seward Peninsula. Millrock concentrated exploration on the Bluff property east of Nome during 2008. At the Daniel's Creek prospect, Millrock drilled 1,300 feet of a planned 4,900-foot program aimed at testing historic drill results reported by BHP Minerals. Drill hole BLF1001 intersected 19.5 feet with an average grade of 0.041 ounces of gold per ton and hole BLF1003 intersected 4.5 feet with an average grade of 0.111 ounces of gold per ton. Sampling carried out at the Koyana zone, about 1.7 miles east of the Daniel's Creek prospect, extended gold mineralization at Koyana 1,600 feet southeast to what is now known as the Koyana Beach showing. Grab samples of quartz–carbonate–arsenopyrite veins returned favorable assay results at this location. Millrock carried out initial vegetation and soil geochemical surveys in the Council area to identify lode sources of the prolific placer deposits. Millrock also carried out vegetation, soil, stream sediment and rock sampling surveys in the Ungalik area, focusing in particular on areas upstream from the old placer workings that produced approximately 300,000 ounces of gold.

Millrock Resources Inc. and Alix Resources Corp. completed geologic mapping, trenching, and drilling at the Divide gold project about 28 miles north of Nome. Drilling totaled 8,715 feet in 22 reverse-circulation holes, and 24 trenches were excavated a total length of

Figure 12. Drilling underground at the Nixon Fork Mine by St. Andrew Goldfields Ltd. Drilling in 2008 concentrated on exploring for additional gold–silver–copper–bismuth mineralization. Photo provided by Mystery Creek Resources Inc.

4,080 feet over gold–arsenic soil anomalies. Drill hole DIV3004 intersected 50 feet grading 0.090 ounces of gold per ton, while hole DIV3019 intersected 5 feet grading 0.289 ounces of gold per ton. Trench DIV2016T intersected 75 feet grading 0.064 ounces of gold per ton, while trench DIV2008T intersected 55 feet grading 0.044 ounces of gold per ton.

Millrock Resources terminated the option agreement with Full Metal Minerals for the Inmachuk property after a review of 2007 drilling results.

Great Basin Gold Ltd. conducted trenching and rock chip sampling at the Ganes Creek gold property northwest of McGrath. More than 250 select hand samples and 2,918 continuous chip samples were collected from exploration trenches; 487 soil samples were collected. A ground induced-polarization (IP) geophysical survey was also completed, with more than 23,000 feet of lines cleared.

NovaGold Resources Inc. conducted limited exploration on the Rock Creek project. Drilling consisted of 19 reverse-circulation drill holes totaling nearly 6,500 feet, and 1,312 samples were tested for gold. Drilling targeted tension vein mineralization, primarily along the western margin of the Rock Creek open pit. Two trenches totaling 380 feet were excavated elsewhere on the property, exploring for extensions of mineralized structures. Narrow ore-grade mineralization was identified in one of the trenches.

NovaGold conducted limited exploration and staked additional claims around ground optioned from Rosander Mining Co. at the Colorado Creek gold project northwest of McGrath. NovaGold also conducted exploration at the Kugruk project near Candle. No results were announced.

Triex Minerals Corp. conducted limited exploration including site cleanup on the Boulder Creek and Fireweed uranium prospects near Elim. Triex and Full Metal Minerals Ltd. dropped their option on the Boulder Creek property, but retained interest in nearby claims.

Limited exploration was conducted by gold placer miners across the region. Goldstrike Mining Corp. completed some exploration drilling on Martin Creek. Little Creek Mine completed some trenching on Ester Creek.

EASTERN INTERIOR REGION

International Tower Hill Mines Ltd. focused on the Livengood gold project northwest of Fairbanks during 2008. Mineralization in the Money Knob deposit forms stratabound and cross-cutting bodies in a large thrust-faulted and recumbently folded sedimentary and volcanic sequence. The main body of mineralization lies within a 1-mile-wide, 3.5-mile-long, northeast-trending belt. This large structural zone localized a series of 90-million-year-old dikes, sills, and plugs that are believed to be related to the gold mineralization. The company drilled 116 holes in a resource-definition grid pattern and excavated approximately 1,500 feet of trenches to define the high-grade Core Area, which has mineralization averaging almost 0.030 ounces of gold per ton over a 5,000-foot strike length and 1,600- to 2,900-foot width (fig.13). Table 9 lists some of the significant mineralized intercepts from the 2008 drilling program. Giroux Consultants Ltd. and Mineral Resource Services Inc. were contracted to provide a technical report, including a mineral resource estimate, of the Livengood project. A resource defined in October 2008, based on a 0.015 ounces of gold per ton cutoff, includes an indicated

Figure 13. International Tower Hill Mines Ltd. conducted a large core and reverse-circulation drilling program on the west flank of Money Knob. Out of 115 holes drilled in 2008, 108 were mineralized over more than 10 percent of their length and 55 were mineralized for more than 40 percent of their length. The 2008 drill program did not identify limits to mineralization in any direction. Photo provided by International Tower Hill Mines Ltd.

76.6 million tons containing 1.86 million ounces of gold and an inferred 96.8 million tons containing 2.17 million ounces of gold. The Livengood target is open in all directions as well as at depth. The resource crops out at one end and then dips shallowly, possibly lending itself well to low-strip open-pit mining. Preliminary metallurgical tests indicate mineralization responds well to heap leaching, with increasing recoveries at finer crush sizes.

Freegold Ventures Ltd. completed approximately 40,550 feet of rotary air blast drilling in 1,347 holes and 26 core drilling holes totaling 10,061 feet, covering a large area of the Golden Summit project on Cleary Summit near Fairbanks. Significant drill results along the Cleary Hill vein system include 303 feet grading 0.027 ounces of gold per ton, 101 feet grading 0.046 ounces of gold per ton, and 55 feet grading 0.184 ounces of gold per ton. A bulk sampling program continued in 2008, with approximately 50,000 tons of crushed bulk material fed through a gravity-based recovery plant. Only approximately 400 ounces of gold were recovered due to plant configuration problems and over-grinding of material. Interpretation of preliminary assays suggests that the bulk sampling program confirmed the existence of bulk mineable mineralization at potentially economic grades. Freegold continued modeling trenching, drilling and partial bulk sampling results, and began digitizing geological mapping work.

Freegold also continued exploration, including drilling, prospecting, and an IP survey, at the Rob project in the Goodpaster region (fig.14). Mineralization at Rob is hosted in granitic and gneissic rocks and appears to be controlled by district-scale northeast and northwest-trending structures. Results from 12 core holes drilled at the Gray Lead prospect include intercepts of 7.9 feet grading 1.81 ounces of gold per ton and 13.5 feet grading 0.586 ounces of gold per ton. Interpreted results suggest additional gold-bearing veins in the area.

Fairbanks Gold Mining Inc., a subsidiary of Kinross Gold Corp., in joint venture with Teryl Resources Corp. on the Gil property, collected 103 Bombardier-mounted auger soil samples at the Last Chance area and drilled nine reverse circulation drill holes totaling 4,477 feet at the Sourdough Ridge area. Drill targets were gold-mineralized calc–silicate horizons and quartz veins. The best drill results, in hole GVR08-505, were 25 feet assaying 0.018 ounces of gold per ton from 120- to 145-foot depth and 40 feet assaying 0.061 ounces of gold per ton from 375- to 415-foot depth.

Fairbanks Gold Mining continued exploration on other targets in the Fairbanks area, including in-pit and targets close to the Fort Knox Mine. The Web area was

Table 9. Significant 2008 drill results at the Livengood project (calculated by International Tower Hill Mines Ltd. using a 0.0073 ounce of gold per ton cut-off value).

Hole no.	From (feet)	To (feet)	Length (feet)	Gold Grade (ounces per ton)
MK-08-30	419.6	603	183.4	0.031
MK-08-31	265	354.5	89.5	0.141
MK-08-31	1,018.4	1,149.7	131.4	0.029
MK-08-33	386.7	834	447.3	0.031
MK-RC-0007	85	235	150	0.042
MK-RC-0007	420	615	195	0.057
MK-RC-0008	35	690	655	0.042
MK-RC-0013	430	535	105	0.029
MK-RC-0023	645	835	190	0.073
MK-RC-0024	335	500	165	0.040
MK-RC-0031	140	670	530	0.030
MK-RC-0033	820	945	125	0.039
MK-RC-0034	655	755	100	0.033
MK-RC-0034	805	935	130	0.057
MK-RC-0039	60	145	85	0.098
MK-RC-0039	435	625	190	0.038
MK-RC-0043	280	750	470	0.038
MK-RC-0045	440	845	405	0.030
MK-RC-0050	585	870	285	0.034
MK-RC-0060	835	1,105	270	0.032
MK-RC-0060	835	1,105	270	0.032
MK-RC-0064	560	1,090	530	0.038
MK-RC-0065	645	845	200	0.030
MK-RC-0069	665	840	175	0.029
MK-RC-0071	450	990	540	0.045
MK-RC-0074	315	425	110	0.034
MK-RC-0075	240	285	45	0.175
MK-RC-0075	500	620	120	0.031
MK-RC-0076	485	690	205	0.026
MK-RC-0078	540	980	440	0.030
MK-RC-0081	560	705	145	0.031
MK-RC-0082	430	590	160	0.033
MK-RC-0082	650	715	65	0.066
MK-RC-0085	745	910	165	0.032
MK-RC-0089	455	785	330	0.034
MK-RC-0093	760	860	100	0.031
MK-RC-0094	435	595	160	0.049
MK-RC-0094	630	740	110	0.038
MK-RC-0095	465	880	415	0.036
MK-RC-0098	515	720	205	0.032
MK-RC-0099	400	575	175	0.032
MK-RC-0099	670	785	115	0.038
MK-RC-0102	385	465	80	0.055
MK-RC-0106	1,015	1,100	85	0.050

Figure 14. Drilling at the Gray Lead prospect on the Rob property by Blackrock Drilling Corp. for Freegold Ventures Ltd. Photo provided by Avalon Development Corp.

staked during 2008. The exploration focus in 2009 will be on delineating resource potential on the south wall target of the Fort Knox pit and additional infill drilling to further define mineralized extensions in the northwest sector of the Phase 7 push-back.

MAX Resource Corp. completed a 10-hole diamond drill program totaling 7,664 feet at the Gold Hill porphyry molybdenum–copper–gold project during 2008. Drilling expanded the identified mineralized system to the north and northeast. Significant drill results include 605 feet of 0.026 percent molybdenum and 0.04 percent copper from surface to 605-foot depth in hole DDH-08-01, 670 feet of 0.032 percent molybdenum and 0.04 percent copper in hole DDH-08-05 with 175 feet of 0.053 percent molybdenum (Mo) from 385- to 560-foot depth in hole DDH-08-5, 100 feet of 0.071 percent Mo from 150- to 250-foot depth in hole DDH-08-6, and 50 feet of 0.121 percent Mo from 850- to 900-foot depth in hole DDH-08-8. The results indicate that mineralization continues to depth and to the north and northeast and the area of mineralization coincides with a magnetic anomaly. No further work commitments are required on this project until 2011.

Full Metal Minerals conducted surface exploration and drilling at the LWM polymetallic carbonate replacement prospect near Chicken. Mineralization occurs within dolomitized marble host rock, with the primary zone located adjacent to a fault zone. Exploration work included collecting 72 rock samples and 990 soil samples for geochemical analysis. During 2008, 47 drill holes, totaling 37,062 feet, were completed at LWM, with massive to semi-massive sphalerite–galena–chalcopyrite mineralization intersected in most holes. Step-out and infill holes were completed on 165-foot centers along strike and down-dip. The widest mineralized intercept was in hole LWM08-32, with 54.7 feet averaging 14.46 percent zinc, 11.14 percent lead, and 6.34 ounces of silver per ton. The most mineralized significant intercept was in hole LWM08-33, with 12.8 feet averaging 17.87 percent zinc, 11.84 percent lead, 0.33 percent copper, and 6.87 ounces of silver per ton. Other drill results include hole LWM08-35, with 40 feet averaging 6.4 percent zinc, 2.7 percent lead, and 1.14 ounces of silver per ton; hole LWM08-44, with 7.5 feet averaging 12.2 percent zinc, 31.6 percent lead, and 13.98 ounces of silver per ton; hole LWM08-45, with 22.8 feet averaging 4.9 percent zinc, 11.6 percent lead, and 5.29 ounces of silver per ton; hole LWM08-49, with 14.8 feet averaging 7.9 percent zinc, 14.5 percent lead, and 5.23 ounces of silver per ton; hole LWM08-49, with 20.3 feet averaging 18.2 percent zinc, 4.3 percent lead, and 4.83 ounces of silver per ton; and hole LWM08-53, with 19 feet averaging 13.4 percent zinc, 4.3 percent lead, and 2.18 ounces of silver per ton. Two subparallel zones of massive carbonate-replacement mineralization were traced over 2,300 feet of strike length and more than 1,000 feet below surface. The deposit is open for expansion in all directions. Nine samples from holes LWM08-23, 28, and 34 had indium values ranging from trace to 39.8 parts per million (ppm) and averaging 16.1 ppm indium.

Millrock Resources acquired three blocks of mining claims in the Fortymile mining district. Millrock is targeting disseminated and vein-style intrusion-related lode gold deposits. Millrock conducted limited exploration in the area, including the Chicken and Napoleon properties, during 2008.

Teck-Pogo Inc. carried out an exploration drilling program on the Pogo property. A helicopter-supported,

two-rig drill program completed 20 holes totaling 37,449 feet. This included 18 holes (33,331 feet) drilled on the Pogo millsite lease and two holes at the Chorizo prospect. Underground exploration drilling at the Pogo Mine included 16 holes totaling 13,529 feet. No drill results were released.

Rubicon Minerals Corp. conducted a property-wide reconnaissance exploration program in the Pogo area, including geologic mapping, prospecting, and soil sampling with limited drilling. Geochemical sampling included 118 rock samples and 27 pan concentrates on the California-Surf property, 13 rock samples, 67 soil samples, and four pan concentrate samples on the Eagle-Hawk property, 26 rock samples and three pan concentrate samples from the Bou-Swede property, and 359 rock samples and nine pan concentrate samples from the ER-Ogo-Fire property. Drilling targeted new mineralization found 1,000 feet northwest of an area drilled in 2003 and 2004 on the ER claims under option from Rimfire Minerals Corp. Angular mineralized talus was identified over an area 330 feet long, where nine of 40 samples returned in excess of 0.073 ounces of gold per ton, including a highlight of 1.715 ounces of gold per ton. Three holes totaling approximately 1,099 feet were completed to test this mineralization, but no significant gold mineralization was intersected.

International Tower Hill Mines conducted work on the West Pogo property. Results highlighted a large new east–west-trending gold anomaly with high-grade gold (up to 3.46 ounces of gold per ton) in rock chip samples. International Tower Hill dropped their option on Doyon Ltd. lands, including the West Tanana property, and abandoned the Gilles property. International Tower Hill Mines did not conduct fieldwork on the LMS and Coffee Dome projects during 2008.

Copper Ridge Explorations Inc. contracted a geologic mapping and sampling program on the Ogopogo project, carried out by Avalon Development Corp. of Fairbanks, Alaska.

Sumitomo Metal Mining and Stone Boy Inc. contracted Pathfinder Mineral Services to conduct exploration on the Monte Cristo Creek portion of the Stone Boy project. Work included collecting 380 soil and rock geochemical samples, geologic mapping, and drilling 14 core holes totaling 9,000 feet. Work on the nearby Brink property included geologic mapping and collecting 325 soil and rock geochemical samples. Geochemical results were not announced for these projects.

International Tower Hill Mines announced an initial mineral resource estimate for the Camp Zone deposit at its LMS project near Delta Junction. The mineral resource estimate was completed by Giroux Consultants Ltd. and Mineral Resource Services Inc. and was based on 24 drill holes covering approximately 820 feet of strike length and 1,925 feet of down-dip mineralization. Gold mineralization within the Camp Zone is associated with a siliceous breccia horizon within a schist unit. The independent study determined an initial inferred gold resource of 167,000 ounces of gold at a cutoff grade of 0.009 ounces of gold per ton with an average grade of 0.026 ounces of gold per ton. Much of the higher-grade gold mineralization drilled on the property was not included in the estimate because it could not be accurately modeled due to the widely spaced nature of the drilling. International Tower Hill Mines acquired 100 percent interest in the property by year's end.

Goldstone Resources LLC discovered a high-grade gold–tungsten–bismuth float train on its Amanita property near Fairbanks about 3,500 feet along strike from the previously drilled Tonsina prospect. During reconnaissance a satellite intrusive system was also identified immediately south of the Gilmore Dome pluton and completely within the Amanita property.

New Gold Inc., a new company based on the merger of Metallica Resources Inc., Peak Gold Ltd., and New Gold Inc., continued working on the Liberty Bell property north of Healy. A 50-year mining lease agreement was signed earlier in the year by Metallica. An IP geophysical survey, completed by Gradient Geophysics, covered 21.4 line miles, with line pairs spaced 1,970 feet apart and readings taken at 492-foot spacing along lines. The IP survey covered four areas of widespread gold mineralization. Work also included detailed logging of 1996 and 1997 diamond drill core, compilation of historic drill data, staking 23 state mining claims, continuing geologic mapping and geochemical rock sampling, and continuing baseline water sampling done by Bristol Environmental Services. AeroMetrics, Anchorage, prepared a new topographic map of the main project area with a 10-foot contour interval.

Full Metal Minerals and BHP Billiton Mineral Services Co. completed an extensive airborne geophysical survey over eastern Alaska, identifying multiple new target areas with potential to host copper–gold–molybdenum porphyry deposits. The partners signed a mining exploration agreement with option to lease with Doyon Ltd., a regional Native corporation, for 88,675 acres of Doyon conveyed and selected lands. Field crews conducted claim staking on seven claim groups, mapping, geochemical sampling, and IP geophysical work over historic and newly identified prospects. BHP terminated their option with Full Metal prior to year's end.

In 2008, 1618524 Ontario Ltd. optioned the Caribou Dome (Denali Copper) prospect in the Valdez Creek mining district from the C-D Development Corp. YOW Capital Corp. and 1618524 Ontario subsequently agreed for YOW Capital to acquire all issued and outstanding shares in 1618524 Ontario. The last significant

exploration work on the property was done in 1999, and 1618254 Ontario commissioned a technical report to summarize the geology and exploration work completed on the property since its discovery in 1963.

Senator Minerals Ltd. drilled three core holes on the Taurus porphyry copper–molybdenum–gold property. Results were not released.

Australian Mineral Fields Ltd. optioned the Tushtena gold project near Tok from Alaska-based Tushtena Resources Inc., with the right to earn an 80 percent interest in the property by spending $5 million within 5 years of the agreement execution and an additional 5 percent upon completion of a bankable feasibility study. Historic rock chip samples from outcropping quartz–arsenopyrite–carbonate veins with visible gold assayed up to 42.3 ounces of gold per ton. Historic work at the Discovery Zone identified a 0.6-mile-long soil anomaly with greater than 250 parts per billion gold and a coincident greater than 500 parts per million arsenic. Core from ten holes drilled in 1986, 1987, and 2000 at the Discovery Zone was sampled in 2008 and indicated general agreement between 2008 and historic assay results. These results included 9.5 feet grading 0.716 ounces of gold per ton in hole AR4 and 7 feet grading 0.324 ounces of gold per ton in hole AR9.

Silverado Gold Mines Ltd. completed a mineral resource estimate for its Ester Dome property near Fairbanks. The study estimates an indicated resource of 631,600 tons containing 126,700 ounces of gold and an inferred resource of 2,553,400 tons containing 214,100 ounces of gold. All reclamation work was completed on the Ester Dome property and work continued to complete closure of the Grant Mill tailings pond.

The Alaska Division of Geological & Geophysical Surveys (DGGS) conducted fieldwork, including geologic mapping and geochemical sampling of rock, in the Dry Creek and Tok areas. DGGS conducted fieldwork to geologically map approximately 200 square miles in the eastern Bonnifield mining district, including the Dry Creek and WTF volcanogenic massive sulfide deposits. A geochemical data report, and 1:50,000-scale bedrock- and comprehensive geologic maps are scheduled to be published in 2010. DGGS mapped between Dot Lake and Tetlin Junction on the Alaska Highway as part of the Gas Pipeline Corridor Project. Project geologic maps and geochemical reports are to be published in 2009 and 2010.

DGGS contracted Stevens Exploration Management Corp. and acquired airborne-geophysical data for parts of the Mt. Hayes, Gulkana, and Nabesna quadrangles as part of an integrated geophysical and geological mineral inventory program. The 442-square-mile survey area is in the Chistochina mining district about 17 miles east of Paxson and 40 miles southwest of Tok. Geophysical maps and digital data are to be released in 2009.

Brett Resources Inc. conducted 5 days of reconnaissance mapping, prospecting, and sampling of the Long Creek and Ohio Creek tin–silver prospects in the Alaska Range.

Minor placer gold exploration activities, including prospecting, trenching, and geophysical surveys, continued in most mining districts across the region.

SOUTHCENTRAL REGION

International Tower Hill Mines worked on the Chisna property east of Paxson. A stream-sediment geochemical survey was completed over the Canyon Creek and Slate Creek Northwest claim blocks, as well as geological mapping and prospecting in the region.

Full Metal Minerals Ltd. commenced underground rehabilitation work at the Lucky Shot property north of Anchorage after executing an extended mining lease with Alaska Hardrock Inc. Work included about 400 feet of underground drifting from the historic Coleman adit to access high-grade gold mineralization in the Lucky Shot shear. Full Metal also purchased a used 200-ton-per-day mill to use on the property (fig. 15). A ten-hole, 7,800-foot drilling program was completed on the War Baby block, but no results were released.

Geoinformatics Exploration Inc. completed an 11-hole, approximately 14,100-foot drilling program at the Whistler porphyry copper–gold project near Rainy Pass. Five holes were drilled in the Whistler zone and six holes on nearby prospects, including the Raintree West prospect. The best result from the 2008 Whistler drilling was hole WH-08-08 with a 2,385-foot intersection from the surface grading 0.014 ounces of gold per ton, 0.025 ounces of silver per ton, and 0.14 percent copper. Other drill results from the drilling at the Whistler prospect include hole WH-08-10 with a 544.6-foot intersection from 164-foot to 708.6-foot depth grading 0.18 percent copper, 0.010 ounces of gold per ton, and 0.090 ounces of silver per ton. Drilling at the Rainmaker prospect included a 495.8-foot intersection grading 0.18 percent copper and 0.011 ounces of gold per ton. No significant mineralization was encountered in drilling at the Rainmaker South prospect.

Pure Nickel Inc. optioned the MAN nickel–copper–platinum-group-element property to ITOCHU Corp., a multi-billion-dollar Japanese conglomerate, for up to a 75 percent interest by investing up to $40 million by 2014. Major Drilling was contracted for a drill program focused on broad versatile time domain electromagnetic (VTEM) geophysical conductor targets in the Beta Complex area. Drillholes intersected wide zones of weakly disseminated sulfides, with a 1.6-foot sulfide-bearing intersection grading 1.39 percent nickel and 1.27 percent copper. ITOCHU's geological team also

Figure 15. Arrival of ball mill at the Lucky Shot property. The ball mill was part of a 200-ton-per-day mill purchased for use on the property. Full Metal Minerals Ltd. plans to develop this historic gold mine in the Willow Creek mining district during 2009. Photo provided by Full Metals.

initiated a prospecting and mapping program over the four known ultramafic complexes on the property.

Geohedral LLC, a company with a 23.16 percent interest held by the Beard Co., staked claims covering black sand deposits with magnetite, ilmenite, rutile, and potentially meaningful quantities of gold, silver, and other precious metals over more than 75 square miles of federal and state lands along the shore of the Gulf of Alaska near Yakutat. Geohedral retained Norwest Corp. to supervise the exploration project and drilled 11 holes totaling more than 1,000 feet and ranging from 65- to 125-foot depths. No results were announced.

Millrock Resources optioned the South Estelle property from Full Metal Minerals. Millrock conducted geochemical sampling of talus fines and rocks; results indicate two large gold anomalies at the Shoeshine and Oxide Ridge occurrences. The average of 24 talus fine samples in a 700 foot by 1,000 foot anomalous zone at the Oxide Ridge occurrence was 0.0677 ounces of gold per ton. The anomalous zone at the Shoeshine occurrence is about 0.6 miles long by 1,000 feet wide and 49 talus fine samples average 0.017 ounces of gold per ton. Gold occurs with arsenopyrite and chalcopyrite as disseminated grains within porphyritic plutonic rocks, and in quartz stockworks and zones of sheeted quartz veins. One sample of porphyry rock cut by sheeted quartz veinlets assayed 0.383 ounces of gold per ton.

Pacific North West Capital Corp. completed IP and ground magnetic surveys exploring for sulfide- and chromite-enriched layers in the Tonsina Ultramafic Complex. Geophysical and surface sampling results suggest a 1,000-foot strike length to previously discovered sulfide mineralization with platinum-group-element mineralization (fig. 16).

Diamond Gold Corp. continued exploration for diamonds, gemstones, and gold in the Yenlo Hills.

Figure 16. Jon Findlay, Greg Myers, and Chris Van Treeck (left to right) examining ultramafic rocks in the Tonsina Ultramafic Complex. Photo provided by Avalon Development Corp.

SOUTHWESTERN REGION

Northern Dynasty Minerals Ltd. announced an updated mineral resource estimate for the Pebble Limited Partnership's Pebble deposit based on 476 drill holes in the Pebble West and Pebble East deposits. At a 0.30 percent copper equivalent cut-off (using defined metal ratios and metal prices for copper, gold, and molybdenum), the Pebble Deposit contains 5.62 billion tons of measured and indicated mineral resources grading 0.77 percent

copper equivalent, containing 48 billion pounds of copper, 57 million ounces of gold, and 2.9 billion pounds of molybdenum; plus 4.4 billion tons of inferred mineral resources grading 0.55 percent copper equivalent, containing 24 billion pounds of copper, 37 million ounces of gold, and 1.9 billion pounds of molybdenum.

Northern Dynasty and the Pebble Partnership updated the mineral resource for the Pebble East deposit in late February 2008. At a 1 percent copper equivalent cut-off, the Pebble East deposit contains inferred mineral resources of 1.67 billion tons of ore with a 1.32 percent copper equivalent. The calculated mineral resource contains 27 billion pounds of copper, 24 million ounces of gold, and 1.2 billion pounds of molybdenum.

The 2008 drilling program at Pebble was designed to upgrade the resource classification of a portion of the Pebble East mineral resources to an indicated category in preparation for prefeasibility mine planning studies, and to test for the outside limits of the deposit. The program also included metallurgical, geotechnical, and environmental drilling. Work included 175,469 feet of core drilling in 152 holes and 82 rotary holes totaling 6,748 feet (fig. 17). The core drilling total includes 119,293 feet of drilling in 26 holes to delineate the Pebble East deposit and to provide detailed geotechnical information for mine planning purposes. Fifteen core holes, totaling 14,511 feet, were drilled for metallurgical testing, and 111 core holes, totaling 41,665 feet, were drilled for geotechnical work. Rotary drilling supported engineering and environmental work. Ten helicopters supported drilling and other site activities. Six drill rigs were drilling at the property in April.

Engineering work at the Pebble project focused on collection of additional site and underground geotechnical data to support ongoing design work, continuing of metallurgical test work on the Pebble West and Pebble East deposits to optimize conventional processing systems and designs, continuing assessment of major infrastructure elements (access road, port, and power), and development of likely scenarios for the prefeasibility study. Based on the data collected from this work, a team of approximately 20 engineers and technical specialists (many from Anglo American), as well as 58 engineering firms and other consultant groups, is currently preparing the pre-feasibility study for the project.

Environmental and socioeconomic baseline data studies have been completed for five consecutive years at the Pebble project. Comprehensive environmental and socioeconomic base-line study programs continued in 2008, with 26 environmental and socioeconomic study teams. The 2008 field programs focused on water, aquatic habitat/fish resources, terrestrial habitat/wildlife resources, wetlands, and subsistence/traditional use. Seventy-eight holes were drilled for environmental studies, especially to map out groundwater flow regimes and to understand groundwater chemistry. The environmental baseline document remains on schedule to be finalized and submitted with permit applications.

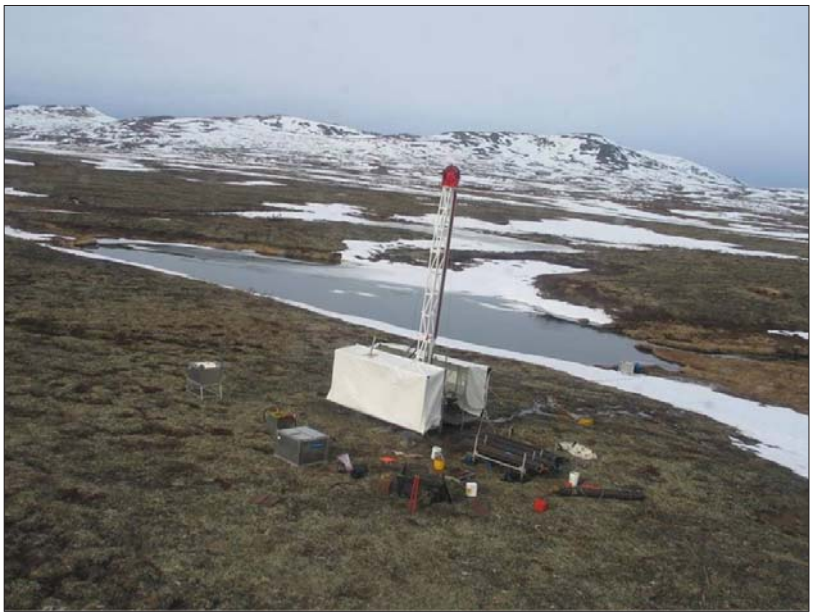


Figure 17. Core drilling at the Pebble property. Nearly 1,000 holes have been drilled on the property since 2002. Drilling in 2008 was conducted by American Recon, Boart Longyear, and Foundex. Photo provided by the Pebble Limited Partnership.

The Pebble Partnership conducted hundreds of public meetings and project presentations across southwestern Alaska and the State in 2008. About 50 stakeholder tours were conducted of the Pebble Project site and operating mines in Alaska and other jurisdictions. In addition, the Keystone Center, a non-profit organization specializing in developing stakeholder dialogue processes, is working with the Pebble Partnership to design and facilitate an independent, stakeholder-driven dialogue process around the Pebble project, to begin in 2009. The program may include recruitment of independent technical and scientific experts to review the Pebble Partnership's work and serve as a credible and objective arbiter for project stakeholders. The Pebble Partnership has a number of other initiatives underway to enhance stakeholder relationships. These initiatives include investment in community socioeconomic development programs like the Pebble Fund for Sustainable Bristol Bay Fisheries and Communities, a five-year, $5 million endowment to enhance the health and sustainability of regional fisheries and the communities they support. The Pebble Partnership also began the Pebble Project Pre-Permitting Environmental and Socioeconomic Data Release Series, a voluntary initiative to share the preliminary findings of the Partnership's comprehensive environmental study program with project stakeholders prior to the beginning of project permitting.

Contract and full-time personnel working at the Pebble project site near Iliamna peaked at 232 in the summer of 2008. Some 130 individuals from local communities worked on the project in 2008. A $59 million budget for 2009 was approved to continue the project towards a Prefeasibility Study and possible permitting beginning in 2010.

Anglo American Exploration (USA) Inc. staked state mining claims in the Styx River area near Mt. Estelle. Anglo American, with assistance from Alaska Earth Sciences, conducted geological mapping, prospecting, and geochemical sampling, including 472 stream-sediment, 116 whole-rock, and 129 rock samples, on the Styx, Fork, and SF claim blocks. Geochemical results were not released.

Full Metal Minerals Ltd., with financing from joint-venture partner Freeport–McMoRan Exploration Corp., drilled seven core holes totaling approximately 5,440 feet at the Pebble South property. No results were announced.

Donlin Creek LLC focused on drilling the East ACMA target at the Donlin Creek gold project near Aniak. Initial drilling identified deep mineralization along the East ACMA trend. Phase 2 drilling included some additional holes in the East Acma structural zone as well as some select infill holes in the Lewis and Akivik areas. This drilling indicates that a broad zone of higher-grade gold mineralization continues at least 1,600 feet east of the current pit-constrained resource. Table 10 lists some of the results from the 2008 drilling program. Exploration drilling also targeted potential oxide/non-refractory mineralization. A total of 108 HQ/NQ diameter core holes totaling 109,663 feet were drilled for exploration, resource infill, condemnation, and geotechnical studies. Work elsewhere on the Donlin Creek project identified an area of possible non-refractory gold mineralization, with broad zones of stockwork

Table 10. Selected significant 2008 drill results at the Donlin Creek property.

Drillhole no.	Mineralized intersection length (feet)	Number of intervals	Gold grade (ounces per ton)	Area
DC08-1686	842.9	19	0.095	East Acma
DC08-1687	234.6	9	0.131	East Acma
DC08-1688	196.9	4	0.127	East Acma
DC08-1689	138.1	8	0.203	East Acma
DC08-1695	992.8	13	0.116	East Acma
DC08-1701	506.9	12	0.107	East Acma
DC08-1702	526.9	8	0.148	East Acma
DC08-1705	874.7	14	0.077	East Acma
DC08-1708	683.4	15	0.095	East Acma
DC08-1709	214.6	7	0.179	East Acma
DC08-1710	1,091.6	13	0.112	East Acma
DC08-1715	370.4	6	0.116	East Acma
DC08-1706	72.2	3	0.147	Lewis & Akivik
DC08-1716	379.9	11	0.092	Lewis & Akivik
DC08-1719	353.0	10	0.124	Lewis & Akivik
DC08-1764	98.4	2	0.083	Lewis & Akivik
DC08-1765	138.8	3	0.094	Lewis & Akivik

quartz veining and traces of visible native gold. A soil sampling program expanded the known area of surface gold mineralization in several directions.

A preferred design for the Donlin Creek project was selected in June, consisting of processing approximately 55,000 tons per day using onsite diesel and wind co-generation for power (fig. 18). Using this design, the proposed Donlin Creek Mine would operate for more than 20 years and potentially produce 1 to 1.5 million ounces of gold annually. Mine permitting is expected to start in 2009, with construction targeted for 2012. A feasibility study update and pre-permitting activities continued on schedule. On June 10 NovaGold announced that the measured and indicated resource for the Donlin Creek gold project increased to 31.67 million ounces of gold grading approximately 0.073 ounces of gold per ton with an additional 4.16 million ounces of inferred gold resources. The resource includes 6.8 million tons of measured resource at a grade of 0.084 ounces of gold per ton, 27.1 million tons of indicated resource at a grade of 0.073 ounces of gold per ton, and 61.1 million tons of inferred resource at a grade of 0.068 ounces of gold per ton.

Figure 18. A wind monitoring station for the Donlin Creek project. The preferred mine design would use a combination of conventional diesel and co-generated wind power. Photo provided by NovaGold Resources Inc.

The Donlin Creek LLC commissioned AMEC Americas Ltd. to complete a feasibility study for the Donlin Creek project. The study will address the mineral resource, mine plan, processing and support facilities, site access, transportation of materials and equipment, environmental aspects, project execution, operating costs, capital costs, sustaining capital, and contingency.

Pacific North West Capital Corp. explored for platinum and associated metals on the Goodnews Bay project with funding from Stillwater Mining Co. A soil and rock geochemical sampling program was conducted on Susie Mountain. Seven holes totaling 5,597 feet were drilled on the Last Chance and Susie West prospects. No significant platinum–palladium mineralization was identified during the program. Based on exploration results from the past 2 years, Stillwater Mining Co. and Pacific North West Capital Corp. terminated their exploration joint venture and Pacific North West terminated the exploration and mining lease with Calista Corp.

International Tower Hill Mines added to their BMP property southeast of McGrath by optioning nearby Cook Inlet Region Inc. lands. A high-resolution airborne magnetic and electromagnetic survey was completed over portions of the project. Results outlined several anomalies associated with known polymetallic skarn deposits, including the Dall, 6120, and Little Bird prospects. Twenty rock samples collected from skarn at the 6120 prospect averaged 2.3 percent copper, 0.1 ounces of gold per ton, 0.96 ounces of silver per ton, 0.16 percent nickel, and 0.07 percent cobalt. In addition, similar skarn mineralization was sampled 1 mile north at the 6920 prospect.

International Tower Hill announced the results of an initial mineral resource estimate for the Ben Vein deposit on the Terra property. An independent study by Mineral Resource Services Inc. and Giroux Consultants Ltd. based on 20 drill holes, completed in 2006 and 2007, determined an initial inferred resource estimate of 168,000 ounces of gold and 318,000 ounces of silver at a cutoff grade of 0.146 ounces of gold per ton, having an average grade of 0.356 ounces of gold per ton, and 0.674 ounces of silver per ton over an average 7.55 foot width. Gold in the Ben Vein deposit occurs as native gold and electrum with associated silver minerals. Initial gold characterization studies indicate good gravity recovery results, with 79 percent as native gold and 10 percent as gold in sulfide concentrate. International Tower Hill Mines acquired 100 percent interest in the property by year's end.

Gold Crest Mines Inc. signed joint venture agreements with Newmont North America Exploration Ltd. for the AKO, Luna, and Chilly claim groups. Newmont terminated the agreement in December after conducting

exploration, including geologic mapping and collecting rock and soil samples. No results were announced.

Freegold Ventures Ltd. conducted a ground-based IP and resistivity survey to the north and northeast of the Central zone on the Vinasale project near McGrath. Survey results suggest that the anomaly associated with the Central zone gold–arsenic mineralization continues to the north and northeast where widely scattered drill holes have encountered gold mineralization.

Full Metal Minerals Ltd. and Highbury Projects Inc. staked an additional 44 mining claims at the Moore Creek gold property. Sampling and mapping were completed on previously unexplored areas of the property. A 13-hole, 6,162-foot drilling program was completed on the Spring and Troy zones. Zones of silicified and tourmaline-altered monzonite with stockwork quartz veins (up to 2.5 feet wide) and disseminated to massive arsenopyrite, chalcopyrite, pyrite, and trace amounts of pyrrhotite were intersected in the majority of the holes. Hole MC08-01 on the Spring zone intersected 3.2 feet of mineralization grading 0.158 ounces of gold per ton. Hole MC08-05 on the Spring zone had an 18-foot intercept grading 0.125 ounces of gold per ton. Hole MC08-09 on the Spring zone had a 6.5-foot intercept grading 0.098 ounces of gold per ton. Hole MC08-06 at the Troy zone intersected 6.5 feet of mineralization grading 0.168 ounces of gold per ton. All holes in the Spring zone terminated in faulted rock interpreted to be within the Iditarod–Nixon Fork Fault.

Full Metal Minerals optioned the Granite Creek gold property south of McGrath, completed reconnaissance exploration, and later dropped the option. The property has an active gold placer mine and Barrick Gold Corp. has numerous mining claims in the immediate area.

Kinross Gold Corp. and Full Metal completed an extensive gold reconnaissance program in southwestern Alaska (fig. 19). The strategic alliance has a 2-year term and 2008 results are being reviewed.

Alix Resources Corp. conducted exploration at the KUY, Fog Lake, Koksetna, and Kolossus prospects in the Bristol Bay region. The work program at KUY included geologic mapping and sampling, IP and resistivity geophysical surveys, and 1,404 feet of diamond drilling in two holes. Interpreted IP results indicated modest sulfides at depth and the drilling encountered substantial quartz–sericite–pyrite alteration of Tertiary volcanic rocks. One IP resistivity line of 4,600 feet was surveyed and two diamond drill holes of 495 and 508 feet were completed at the Fog Lake property. Drilling results for both holes included altered and pyritized felsic volcanic rocks containing thin zones of quartz, quartz sulfide and sulfide veins. Geochemical results were not announced. IP surveys were conducted on the Koksetna and Kolossus prospects. Andover Ventures Inc. and Alix Resources dropped their options on Bristol Bay Native Corp. lands optioned through Full Metal Minerals after the field season.

Alix optioned Full Metal's Kamishak property in the Iliamna Lake area in January 2008 and then Andover optioned a 20 percent interest in the property. The target is copper–gold mineralization associated with an intrusive breccia body. Work included additional geologic mapping, sampling, and IP and resistivity geophysical surveys to better define the mineralization.

Figure 19. Kinross Gold Corp. and Full Metal Minerals Ltd. alliance team members examine an old adit in the Russian Mountains of southwestern Alaska. Photo provided by Full Metal Minerals Ltd.

XS Platinum Ltd. acquired patented and federal mining claims in the Salmon River drainage, part of the Goodnews Bay mining district, during 2007. XS Platinum employees and contractors spent the 2008 season conducting preliminary bulk-sampling testing, drilling to test platinum and gold placer resources, and upgrading existing camp facilities. XS Platinum plans to conduct additional bulk sampling and a test production program in 2009. XS Platinum is investigating a tailings reclamation project that would use newer technology to extract platinum that was discarded as waste during Goodnews Bay's platinum heyday.

Brett Resources Inc. made final payments on an option agreement and earned an 80 percent interest in the Sleitat tin property from Solomon Resources Ltd. The companies planned a joint venture to explore the property further.

Bristol Explorations Co., a wholly-owned subsidiary of TNR Gold Corp., conducted a geochemical survey on the Iliamna property. Results were not released. BHP Billiton transferred its ownership in the Iliamna project to TNR Gold on September 17, 2008.

Blackpeak LLC conducted mapping of geology and alteration at the Quicksilver prospect in the Kilbuck Mountains. Geochemical sampling consisted of 96 rock samples and eight stream-sediment samples.

Tonogold Resources Inc. sold the lease interest in the Nyac gold project to Nyac Gold LLC. Tonogold retained a one-half percent net smelter royalty.

Limited exploration activities were conducted by gold placer miners across the southwestern region during 2008.

ALASKA PENINSULA REGION

New Gold Inc. continued work on Bristol Bay Native Corp. lands at the Port Moller and Chignik projects. Alaska Earth Sciences assisted with reconnaissance mapping, geochemical sampling, and ground magnetic traverses of the Mallard Duck Bay prospect and preliminary reconnaissance mapping, sampling, and ground magnetic surveys of other less-explored mineral prospects in the greater Chignik region including Marshinlak Creek, Warner Bay, Castle Bay, and Thompson Valley (fig. 20). New Gold terminated its option agreement with Full Metal Minerals on the Port Moller and Chignik projects in late 2008.

Figure 20. Copper-stained cliffs in Warner Bay. Much of the Alaska Peninsula has high potential for porphyry copper and related mineral deposit discoveries. Photo provided by New Gold Inc.

SOUTHEASTERN REGION

Hecla Mining Co. continued exploration at and near the Greens Creek Mine on Admiralty Island near Juneau. Underground exploration drilling in the Gallagher zone extended mineralization more than 200 feet in a southerly plunge. Eighteen holes, totaling 20,649 feet, were drilled on the surface across the 29-square-mile property. Surface drilling from the North Big Sore area defined extensions of mine contact rocks northeast of the current mine workings, which can be correlated for more than 2,000 feet and are still open in both directions. This target area could be accessed through the mine's current infrastructure and will be drilled in 2009. Surface drilling also confirmed the presence of two rock types typical of the Greens Creek deposit about 8 miles north of the mine at the East Ridge target. Coincident geophysical anomalies suggest the rock contact extends for many miles.

Ucore Uranium Inc.'s exploration program at the Bokan Mountain property near Ketchikan focused on expanding high-grade uranium mineralization in the I&L zone and on identifying and evaluating additional drill targets. Holes 10 to 46 (37 holes) were drilled at four separate target areas, with the majority in the I&L zone. Drill holes were logged with a downhole gamma ray spectrometer. Drill results include significant assay results for uranium, rare-earth elements (REEs), and related metals including yttrium, zirconium, beryllium, and niobium. Results also indicate potentially significant concentrations of highly valuable heavy REEs (including holmium, lutetium, terbium, and thulium), many of which are uncommon at most other North American

deposits and have valuations ranging from hundreds to thousand dollars per pound. Uranium results from 2008 drilling include hole LM08-10 with 35 feet grading 0.23 percent U_3O_8; hole LM08-11 with 29.5 feet grading 0.07 percent U_3O_8; hole LM08-20 with 19 feet grading 0.06 percent U_3O_8; hole LM08-21 with 6.6 feet grading 0.12 percent U_3O_8; hole LM08-23 with 1.8 feet grading 0.13 percent U_3O_8 and 11.6 feet grading 0.14 percent U_3O_8; and hole LM08-25 with 24.8 feet grading 0.59 percent U_3O_8. Drill results include 27.5 feet grading 0.028 percent Y_2O_3, 0.020 percent Nb_2O_5, 0.148 percent light REEs, and 0.025 percent heavy REEs in hole LM08-10; 42 feet grading 0.244 percent Y_2O_3, 0.018 percent Nb_2O_5, 0.108 percent light REEs, and 0.110 percent heavy REEs in hole LM08-18; and 23 feet grading 0.076 percent Y_2O_3, 0.143 percent Nb_2O_5, 0.127 percent light REEs, and 0.075 percent heavy REEs in hole LM08-25. Surface sampling identified several zones with even higher REE values outside of the I&L zone and the other main uranium-bearing zones. Most of the uranium mineralization appears to be preferentially located near the margin of the peralkaline granite complex and the highest-grade rare-earth-element mineralization is more distal to the intrusive complex at Bokan Mountain. Higher-grade uranium mineralization at the I&L zone is interpreted to be within vein-like structures that are open to depth and along strike to the southeast.

Committee Bay Resources Ltd. acquired Niblack Mining Corp. and continued exploration at the Niblack polymetallic project on Prince of Wales Island. Exploration included driving an exploration adit for approximately 2,600 feet, and drilling 14,787 feet in 19 holes probing depth extensions of the Lookout zone (fig. 21). The first resource estimate for the volcanogenic massive sulfide project calculated 1.56 million tons of indicated and 2.08 million tons of inferred resources, totaling 3.64 million short tons containing 284,000 ounces of gold, 4.2 million ounces of silver, 59,612 tons of copper, and 115,877 tons of zinc. Indicated resources grade 0.08 ounces of gold per ton, 1.22 ounces of silver per ton, 1.04 percent copper, and 2.14 percent zinc.

Constantine Metal Resources Ltd. continued drilling at its copper-rich volcanogenic massive sulfide Palmer project near Haines. Constantine completed ten drill holes, with two abandoned, totaling 14,421 feet, and containing 17 mineralized intersections. This year's drilling program significantly extended copper–zinc–lead–gold–silver mineralization in three zones at the South Wall target. The South Wall zones appear to occur on the steep limb of a large antiform. The highlight of the drilling was hole CMR08-11, which intersected 119 feet of massive sulfide from 516- to 635-foot depth grading 1.54 percent copper, 0.45 percent lead, 5.45 percent zinc, 0.014 ounces of gold per ton, and 0.83 ounces of silver per ton; followed by a 67-foot massive sulfide zone from 915- to 982-foot depth grading 1.53 percent copper, 0.37 percent lead, 7.62 percent zinc, 0.024 ounces of gold per ton, and 2.94 ounces of silver per ton; followed by a third 42-foot massive sulfide zone from 1,153- to 1,195-foot depth grading 0.47 percent copper, 0.15 percent lead, 6.27 percent zinc, 0.01 ounces of gold per ton, and 0.71 ounces of silver per ton. Drill hole CMR-08-14 intersected a 152.2-foot mineralized intercept of Zone 1 massive sulfide grading 2.78 percent copper, 0.01 percent lead, 3.40 percent zinc, 0.006 ounces of gold per ton, and 0.514 ounces of silver per ton, followed by a 78-foot mineralized intercept of Zone 2 massive sulfide with 0.26 percent copper, 0.31 percent lead, 1.82 percent zinc, 0.006 ounces of gold per ton, and 0.957 ounces of silver per ton. Drill hole CMR-08-17 intersected a 90.3-foot mineralized intercept of Zone 1 massive sulfide grading 2.52 percent copper, 0.15 percent lead, 3.38 percent zinc, 0.009 ounces of gold per ton, and 0.744 ounces of silver per ton, followed by a 15.8-foot

Figure 21. Underground drilling at the Niblack massive sulfide deposit. A new drift from the Mammoth Zone accessed extensions of the Lookout Rhyolite and associated mineralization. Photo provided by Niblack Mining Corp.

mineralized intercept of Zone 2 massive sulfide with 0.91 percent copper, 0.38 percent lead, 21.39 percent zinc, 0.001 ounces of gold per ton, and 0.566 ounces of silver per ton. Drill hole CMR08-19 had a 126.4-foot intersection grading 0.64 percent copper, 0.18 percent lead, 6.91 percent zinc, 0.006 ounces of gold per ton, and 0.726 ounces of silver per ton. Exploration to date has shown that there is now a minimum lateral extent of mineralization in the South Wall target of 1,000 feet horizontally by 1,000 feet vertically in three zones and all zones are open to expansion.

Bravo Venture Group Inc. and Olympic Resources Group LLC focused drilling at Woewodski Island on precious-metal-rich volcanogenic massive sulfide targets at the Brushy Creek and East Lake prospects. Seven Winkie core holes were drilled for a total of 2,446 feet. Drilling results included multiple intercepts up to 16 feet thick of massive pyrite near argillite–volcanic contacts. A new geologic model based on past drill results and basin analysis was developed to be tested by future drilling.

Full Metal Minerals Ltd. and Altair Ventures Inc. drilled nine holes totaling 4,229 feet at the CJ gold project on Prince of Wales Island to extend known mineralization hosted in a structurally controlled, high-grade vein system. No results were announced.

Full Metal Minerals Ltd. optioned the Mount Andrew copper project on Prince of Wales Island to Mosam Capital Corp. Mosam has the option to earn a 60 percent interest in the property by incurring at least $3 million in exploration expenditures over 4 years, making cash payments, and issuing shares to Full Metal. Copper mineralization occurs within semi-massive to massive magnetite skarn bodies associated with andesitic volcanic rocks and intermediate intrusive rocks.

Quaterra Resources Inc. interpreted an airborne time-domain electromagnetic (TEM) survey flown by Fugro Airborne Surveys Inc. in 2008 over Duke Island near Ketchikan. The 20-square-mile airborne survey identified a strong conductive anomaly with a wine-glass-shaped profile adjoining the Marquis, Far North, and Zone A targets. The anomaly is approximately 4,000 feet wide by 5,000 feet long with an additional 2,000-foot extension along the southern edge. The southwestern margin of the TEM anomaly corresponds to a thick section of massive to semi-massive sulfides encountered by Quaterra's past drill holes exploring the Marquis target. Quaterra conducted a surface gravity and natural-source-audio-magneto-telluric (NSAMT) survey to better define electromagnetic anomalies for drill targets at the Monte, Lookout, Far Northeast, and Northeast areas.

Earle Foster completed mapping and geophysical exploration on his placer claims on Porcupine Creek near Haines.

DEVELOPMENT

The development sector of the mining phases as used in this report refers to building infrastructure or activities that facilitate production of mineral products. Development expenditures refer to actual expenditures at mines as well as sustaining capital. Sustaining capital includes equipment replacement and rebuilding, facility upgrades, and other expenditures that must be amortized or depreciated in accordance with tax laws.

Reported and estimated development expenditures in 2008 were approximately $396.2 million, a 24.3 percent increase from the 2007 value of $318.8 million. A total of 33 projects reported development expenditures for 2008. Teck Cominco Alaska Inc. continued expansion of tailings storage facilities at Red Dog Mine. NovaGold Resources Inc.'s construction of the Rock Creek Mine facilities was substantially completed during September and the startup process was initiated. Fairbanks Gold Mining Inc. (Kinross Gold Corp.) continued construction of heap leach facilities at Fort Knox. PacRim Coal LP continued baseline sampling and permitting efforts at their Chuitna Coal project near Anchorage. Coeur Alaska Inc. curtailed construction efforts at the Kensington project on October 1, 2008, pending the U.S. Supreme Court decision on tailings disposal. Hecla Mining Co. acquired 100 percent ownership of Greens Creek Mine in 2008 and continued underground development efforts. Development employment in 2008 was estimated to be 516 full-time-equivalent employees, a 29.8 percent decrease from the estimated 735 full-time-equivalent employees in 2007. The substantial decrease in development employment is inconsistent with the substantial increase in expenditures and likely due to reporting deficiencies.

Table 11 shows development investment and regional employment. Table 12 compares the 2008 investment with that of the previous 26 years by commodity. Figure 22 shows the locations of selected development projects. Development activity was reported in all regions.

NORTHERN REGION

Total development expenditures in the region in 2008 amounted to $45.0 million, all by Teck Cominco at Red Dog Mine, an 8.7 increase over the $41.4 million spent on development in this region in 2007.

Red Dog Mine is the world's largest zinc producer, both in terms of reserves and annual zinc production. The mine is located in northwestern Alaska, approximately

Table 11. Reported mineral development expenditures and employment in Alaska by commodity and region, 2008.

	Northern	Western	Eastern Interior	South-central	South-western	Alaska Peninsula	South-eastern	Total
				Development Expenditures				
Base metals	$45,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$45,000,000
Polymetallic	-	-	-	-	-	-	24,000,000	24,000,000
Precious metals								
Placer	-	78,000	285,000	80,000	147,000	70,000	-	660,000
Lode	-	124,793,422	151,351,172	-	-	-	42,148,000	318,292,594
Coal and peat	-	-	260,000	7,000,000	-	-	-	7,260,000
Industrial minerals	-	-	27,000	164,113	14,000	-	-	205,113
Other	-	-	-	750,000	-	-	-	750,000
TOTAL	**$45,000,000**	**$124,871,422**	**$151,923,172**	**$7,994,113**	**$161,000**	**$70,000**	**$66,148,000**	**$396,167,707**
				Development Employment				
Employment								
Workdays	15,000	49,545	33,104	11,519	330	240	24,295	134,033
Workyears[a]	58	191	127	44	1	1	93	516
No. of companies reporting[b]	1	4	14	8	3	1	2	33

[a]Based on 260-day work year. Total based on non-rounded numbers.
[b]Some companies are active in more than one area/commodity.
- = No expenditures reported.

I Northern Region
1. Red Dog–Teck (permitting, tailings improvement, drilling)

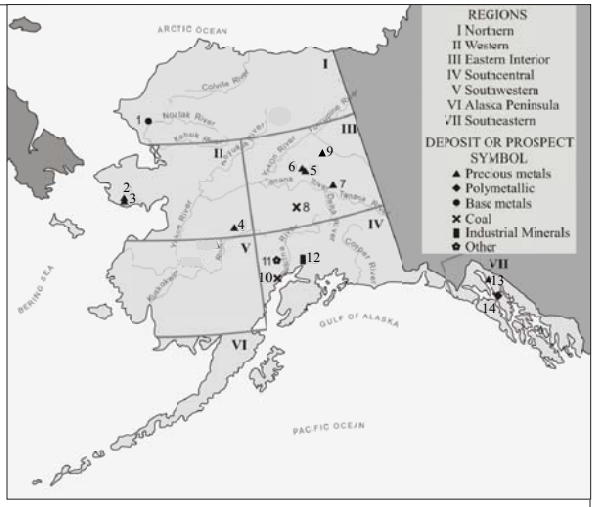
II Western Region
2. Rock Creek–NovaGold Resources Inc. (mine/mill construction)
3. Nome Placers–Arctic Oil & Gas & Shell Trust-Dredge Engineers (offshore placer development)
4. Nixon Fork–St. Andrew Goldfields/Pacific North West Capital

III Eastern Interior Region
5. Fort Knox gold mine–Kinross Gold Corp.
6. Cleary Summit–Freegold Recovery (test mine & milling)
7. Pogo mine–Teck & Sumitomo (underground development)
8. Usibelli Coal Mine Inc.
9. Placer gold–Sherlund Mining LLC

V Southwestern Region

VI Alaska Peninsula Region

IV Southcentral Region
10. Chuitna Coal–PacRim Coal LP (studies, permitting)
11. Gemstone development–road construction
12. Industrial minerals–various



VII Southeastern Region
13. Kensington–Coeur Alaska Inc. (permitting, underground development, other)
14. Greens Creek–Hecla (underground development, tailings upgrade, other)

Figure 22. Selected development projects, 2008.

Table 12. Reported mineral development expenditures in Alaska by commodity, 1982–2008.

	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
2007[a]	41,374,880	30,766,902	239,931,040	1,320,500	5,385,000	318,778,322
2008[a]	45,000,000	24,000,000	319,702,594	205,113	7,260,000	396,167,707
TOTAL	**$941,256,180**	**$371,898,318**	**$2,258,858,049**	**$33,698,047**	**$91,130,000**	**$3,696,840,594**

N/A = Figures not available prior to 1986.
-- Not reported.
[a]Precious metals includes values for "other" - gemstone development.

100 miles north of Kotzebue and 50 miles inland from the Chukchi Sea, at the southern foothills of the Brooks Range. Red Dog Mine is operated by Teck Cominco Alaska Inc. under a 1982 operating agreement with the landowner, NANA Regional Corp. The agreement provides the framework for mine construction and operation. Teck financed the construction, is responsible for hiring, and is required to operate the mine and market its products. In addition, the agreement required training and hiring of NANA's people, preservation of their culture, and protection of subsistence resources.

The mine produces lead and zinc concentrates that are trucked to a port on the coast for shipping during the summer. The road that connects the mine and port, as well as the port facility, is owned by the State of Alaska's Alaska Industrial Development and Export Authority (AIDEA) and is collectively called the DeLong Mountain Regional Transportation System. The Red Dog Mine operation is ISO 14001:2004 certified, and in 2008 it achieved 1 million man-hours without a lost time incident.

Capital expenditures at Red Dog Mine were $45.0 million during 2008. Projects included $4 million spent on 34,815 feet of infill/evaluation drilling and permitting efforts for the Aqqaluk deposit, $15 million on primary tailings dam construction, and $26 million on sustaining capital projects. Employment allocated to development activity at Red Dog was approximately 58 full-time-equivalent contract positions for the year.

Teck Cominco Alaska Inc. and NANA Regional Corp. Inc. are proposing to continue mining operations through 2031 by extending mining activity into the Aqqaluk deposit, located adjacent to the main deposit. The Aqqaluk deposit contains 51.6 million tons of reserves, with 16.7 percent zinc and 4.4 percent lead, and represents an estimated 20 years of additional mining for the region and NANA. To meet the requirements of the National Environmental Policy Act, a Supplemental

Environmental Impact Statement (SEIS) is being completed to evaluate the environmental effects associated with development of the Aqqaluk deposit and new circumstances or information relevant to environmental concerns that have arisen since the 1984 EIS for the Red Dog Mine. On December 5, 2008, the U.S. Environmental Protection Agency (EPA) announced the availability of the draft SEIS and the start of a 60-day public comment period.

WESTERN REGION

The western region was credited with the second-highest development expenditures for 2008. Development expenditures were reported for lode and placer projects. Four projects reported expenditures amounting to approximately $124.9 million for 2008, which compares to development expenditures of $97.0 million for 2007, an increase of 28.8 percent. Total 2008 employment associated with these expenditures was 191 full-time-equivalent employees.

NovaGold Resources continued construction of the Rock Creek Mine located near Nome; the facility was substantially completed during the year and the start-up process began in September 2008, upon receipt of operating permits. Production at Rock Creek Mine began on September 19, 2008, with the 7,100 ton-per-day mill being fed at 25 percent capacity. The mill operated until October 9 (fig. 23). The mill was recommissioned on November 12 and operated until November 24, at which time production was suspended to conserve cash flow. NovaGold stated that it halted operations at Rock Creek because of "unanticipated mechanical problems, challenges in meeting additional environmental requirements, uncertainty of anticipated project cash flow, and uncertainty of its ability to finance itself during the severe prevailing credit and equity market conditions at that time." According to NovaGold, operating problems were further compounded by severe arctic winter conditions in 2008. NovaGold said that it "continues to work with state and federal regulators to meet its environmental requirements and is completing a detailed project assessment to determine the cost, timing, and requirements to successfully restart the commissioning process."

NovaGold had planned to commission the Rock Creek operation during 2008 with the expectation of bringing in $28 million in free cash flow. The planned production rate was 7,700 tons per day to produce 100,000 ounces of gold per year during full capacity. Employment was forecast at 160 persons. NovaGold spent approximately $20 million over budget in 2008 trying to get the mine operational, and building the mine cost at least $40 million more than expected. Capital expenditures at Rock Creek in 2008 were $124.8 million. The mine employed approximately 190 full-time-equivalent personnel in 2008 during development and attempted startup. NovaGold anticipates Rock Creek Mine staffing at approximately 14 employees during the temporary closure period.

Rock Creek gold mine is currently in care and maintenance status, pending a review of whether to recommend startup at the project. NovaGold has stated that it expects to come to a decision about the restart of Rock Creek Mine during the second quarter of 2009. If a decision is made to restart the mine, operations are not expected to begin until at least 2010. NovaGold is also considering selling the mine. Probable reserves at Rock Creek and satellite Big Hurrah are 8.6 million tons at a grade of 0.0378 ounces of gold per ton and 1.32 million tons at 0.1407 ounces of gold per ton, respectively. Table 13 lists gold reserves and resources for NovaGold's properties near Nome.

Figure 23. The Rock Creek Mine mill. The mill operated for about 30 days in 2008 before production was suspended at the mine to conserve cash flow. Photo provided by NovaGold Resources Inc.

On December 28, 2008, Arctic Oil & Gas Corp. and Shell Trust Dredge Engineers announced that they had agreed to pool their respective interests in offshore mining leases in Norton Sound near Nome. Shell holds options over leases in offshore state waters with drill-indicated gold reserves of about 500,000 ounces. The companies hope to commence production in one or more of their

Table 13. Gold reserves and resources at Rock Creek, Big Hurrah, and various NovaGold holdings at Nome, as of December 31, 2008.

RESERVES

Project	Category	Tons	Bank Cubic Yards	Ounces
Rock Creek	Probable	8,600,000	- -	325,000
Big Hurrah	Probable	1,320,000	- -	185,000
TOTAL		**9,920,000**	**- -**	**510,000**

RESOURCES

Project	Category	Tons	Bank Cubic Yards	Ounces
Rock Creek	Indicated	5,100,000	- -	299,500
	Inferred	660,000	- -	21,000
Big Hurrah	Indicated	992,000	- -	77,500
	Inferred	220,000	- -	20,000
Saddle	Historical	3,970,000	- -	258,000
Nome Gold	Measured	- -	103,500,000	964,000
	Indicated	- -	109,600,000	895,000
	Inferred	- -	40,000,000	258,000
TOTAL		**10,942,000**	**253,100,000**	**2,793,000**

- - Not applicable.

lease areas in the 2009–2010 timeframe with initial production targeted at 250,000–500,000 ounces of alluvial gold per year. The joint venture also holds onshore placer resources; initial efforts will go toward upgrading the Denali placer gold project, involving fully permitted onshore claims with 500,000 ounces of drill-indicated reserves and mining equipment already on site. The joint venture has plans to upgrade production equipment at this project to a 60,000-ounce-per-year operation in 2009. The partners are also planning to advance the Norton Sound Alaska Oceanic Placer Gold Project, which encompasses 720 square miles of OCS leases and 2,000 acres of state leases offshore. Additionally, the venture has Bear Creek mining leases in the Colorado Creek Mountains northwest of McGrath.

The Nixon Fork gold–copper mine is approximately 35 miles northeast of McGrath. It was owned by Mystery Creek Resources, Inc., a wholly-owned subsidiary of St. Andrew Goldfields Ltd. The mine was closed in October 2007 pending additional exploration drilling and efforts to sell the operation. No development was reported for 2008. On December 18, 2008, Pacific North West Capital Corp. announced that it had acquired an option, exercisable until February 15, 2009, to purchase a 100 percent interest in Mystery Creek Resources, Inc. Pacific North West Capital Corp. paid $100,000 on signing the agreement. Subject to regulatory approval and the satisfactory completion of its due diligence review, Pacific North West Capital Corp. could exercise the option by paying an additional $400,000, of which $100,000 is required to be paid on closing of the purchase of Mystery Creek Resources with the balance to be paid in three equal installments on May 1, July 1, and September 1, 2009.

Facilities at Nixon Fork Mine include a 200-ton-per-day flotation plant with a gravity gold separation circuit, a sulfide flotation circuit, and a newly constructed carbon-in-leach (CIL) gold leaching circuit. The mine also includes a fleet of mining vehicles, a power plant, maintenance facilities, an 85-person camp, office facilities, and five aircraft landing strips. Mining and processing operations at Nixon Fork Mine are fully permitted and bonded. Mine stockpiles amount to 2,315 tons of ore and approximately 127,868 tons of mineralized tailings.

EASTERN INTERIOR REGION

Total construction and other capitalized expenditures allocated to the eastern interior region amounted to $151.9 million in 2008 compared to $50.2 million in 2007, an increase of $101.7 million, and a nearly 202.6 percent increase from 2007. The eastern interior region had the highest regional development spending in 2008, with a total of 14 projects reporting development activity. Estimated employment allocated to development in the eastern interior region in 2008 amounted to 127 persons.

Pogo Mine, an underground gold mine operated by Teck-Pogo Inc., is a joint venture between Sumitomo Metal Mining Co. Ltd. (51 percent), Sumitomo Corp.

(9 percent), and Teck Cominco Alaska Inc. (40 percent). Pogo began operations in 2006 with a 10-year mine life and was declared to have reached commercial production in April 2007. Capital expenditures at the project during 2008 exceeded $24.75 million and included $3,367,144 in underground core drilling and $21,384,028 for 14,797 feet of lateral development. According to Teck-Pogo Inc., a continued focus on underground development is required to open up the additional ore headings needed to reach the full production rate of 2,500 tons per day. Mining in 2009 is budgeted for 900,000 tons of ore and 13,500 feet of lateral development. There were approximately 49 full-time-equivalent employees involved in development activities at Pogo in 2008.

Fort Knox gold mine is owned and operated by Fairbanks Gold Mining Inc., a wholly owned subsidiary of Kinross Gold Corp. (USA). Fort Knox Mine includes the main Fort Knox open-pit mine, the mill and tailings storage facility, and the Walter Creek heap leach facility. The True North open-pit mine is currently in care and maintenance status. Fort Knox is located within the Fairbanks North Star Borough, approximately 25 miles northeast of Fairbanks.

According to the Kinross Gold Corp. 2008 Annual Activity Report, construction of the 161-million-ton capacity Walter Creek heap leach facility began October 31, 2007. A record-breaking rainy season limited construction activities during 2008 to excavation, grading, manufacturing construction materials, placement and compaction of these materials, and placement of the liner (fig. 24). Ore placement and active leaching is planned for 2009.

The Walter Creek Heap Leach Certificate of Approval to Construct a Dam was received from the Corps of Engineers on October 31, 2007. The heap leach facility will be located in the northwest portion of the mine site upstream of the Fort Knox tailings impoundment and seepage collection system. The heap leach project encompasses 403 acres, including 57.6 acres of U.S. waters. The Alaska departments of Natural Resources and Environmental Conservation issued state authorizations for the project on July 3, 2008.

Development expenditures at Fort Knox Mine amounted to $126.6 million during 2008 compared to $30 million in 2007. Efforts during 2008 included stripping for mining phases 6 and 7, construction of the Walter Creek Heap Leach facility, upgrading of the mill crusher, upgrading of the administrative building and the mine dispatch system, purchase of one new power shovel and six new haulage trucks, and mine equipment rebuilds. Manpower allocation to the development effort was 77 persons for the year. Construction of the heap leach project concluded for the season with completion of approximately 78 percent of the leach pad area required for initial ore placement and leaching. Start-up of leaching operations is scheduled for the third quarter of 2009.

Stripping of Phase 7 (southwest side) commenced in the 4th quarter of 2008. The Phase 7 expansion is anticipated to increase mining production by 63.9 million tons and will allow the Fort Knox pit production to continue until 2015. Stockpile materials will continue to be mined and placed on the heap leach facility until 2021. The mill is projected to operate until 2015, when ore grade material is depleted from Phase 7.

Figure 24. Tree clearing as part of the construction activities associated with development of the Walter Creek heap leach facility at Fort Knox Mine. Photo provided by Fairbanks Gold Mining Inc.

Active mining at True North has been suspended since 2004 and is not currently scheduled for 2009.

Other development activities were noted for 12 additional projects in the Interior. The most significant portion of this development spending was $260,000 paid by Usibelli Coal Mine, which included $50,000 in construction costs and $20,000 for reverse-circulation drilling. There were also notable placer and sand and gravel projects in the region in 2008.

SOUTHCENTRAL REGION

Development expenditures totaling $7.99 million were reported for eight projects in 2008. This is 29.3 percent higher than the $6.23 million spent in 2007. Estimated development employment in the southcentral region was 44 full-time-equivalent positions in 2008 compared to 40 in 2007.

The largest development expenditure in the southcentral region in 2008 was by PacRim Coal LP; the company undertook environmental, permitting, and engineering work in 2008 to advance its Chuitna Coal project, located west of Anchorage on the north side of Cook Inlet. The project is being designed to include a coal export terminal at Ladd Landing. The mine production facility has the capacity to process 3 to 12 million tons per year. Proven coal reserves are reported to be 772 million tons. Forty employees were credited to development efforts on the project in 2008.

Diamond-Gold Corp. undertook development activity at its gemstone (diamond and colored gemstones) Sable Elegance property in the Yentna mining district in the Alaska Range during the year. Construction of 5 miles of all-weather service road, including replacement of three bridges, and installation of culverts, as well as mine development, were listed as development activities.

Six additional projects reported development activity during 2008. Applicable commodities included one placer gold and five sand and gravel operations.

SOUTHWESTERN REGION

Two placer gold projects and one sand and gravel operation reported development activity in the southwestern region in 2008. Total expenditures were $161,000, and one full-time-equivalent position was credited to this effort.

ALASKA PENINSULA REGION

Limited development activity was reported for this region in 2008. One company reported $70,000 in development expenditures and one employee in this region in 2008.

SOUTHEASTERN REGION

The southeastern region had two major projects reporting development expenditures in 2008. Construction continued at the Kensington project for part of the year, and Greens Creek Mine saw ongoing development throughout the year. Development expenditures in the southeastern region totaled $66.15 million, all from the Kensington project and Greens Creek Mine. Development-related employment in the southeast region in 2008 was approximately 93 full-time-equivalent employees.

At Coeur Alaska Inc.'s Kensington underground gold mine complex in southeastern Alaska, 45 miles north of Juneau, 2008 development-related expenditures were $42.15 million and included $2,969,000 for construction, $803,000 for pre-production, $4,465,000 for drifting, $4,708,000 for equipment replacement, and $29,203,000 for other development-related expenses. Total project carrying value was $338.2 million as of December 31, 2008. Employment, including contractors, during 2008 was estimated to be approximately 74 full-time-equivalent positions.

Coeur began the permitting process for a paste tailings storage facility on the Lynn Canal side of the project in the event that litigation failed to resolve disposal in Lower Slate Lake. Previous reports have dealt with this effort through 2007. Coeur and the State of Alaska filed petitions for writ of certiorari to the Supreme Court of the United States on January 28, 2008. On June 27, 2008, the Supreme Court of the United States granted the State of Alaska and Coeur Alaska's petitions for writ of certiorari to review the decision of the Ninth Circuit Court. Oral arguments were made before the Supreme Court by both parties on January 12, 2009.

On October 1, 2008, Coeur announced a temporary curtailment of its development activities at the Kensington Project until such time as a decision was rendered from the Supreme Court. Consequently, the company laid off approximately 50 percent of its existing workforce and paid total termination benefits of $300,000. The Supreme Court ruled favorably, and the Corps of Engineers restored Coeur's permit in August 2009.

Reserves at the Kensington deposit amount to 5,500,000 tons with a grade of 0.27 ounces of gold per ton and containing a total of 1,478,000 ounces of gold. In addition, year-end mineralized material at the Kensington deposit amounted to 2,724,000 tons with a grade of 0.18 ounces per ton. 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 comprise 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 sent to the tailings disposal 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.

Capital expenditures at Greens Creek Mine, owned by Kennecott Greens Creek Co. (operator) and Hecla Mining Co., amounted to $24 million for 2008, not including the acquisition of the 70.3 percent of Kennecott's share. The expenditure was for ore development, modernization of the haulage fleet and a communications system, as well as the addition of tailings capacity. Manpower allocated to development amounted to 19 persons for the year.

Greens Creek Mine has historically been powered completely by on-site diesel generators. An agreement was reached during 2005 to purchase excess hydroelectric power from the local power company. Installation of the necessary infrastructure was completed in 2006, and use of hydroelectric power began during the third quarter of 2006. Low lake levels and increased demand in the Juneau area have combined to decrease power available to Greens Creek Mine, and it is unlikely that the mine will obtain sufficient utility power until 2009.

Hecla Mining Co. announced on February 12, 2008, the acquisition of the balance of the Greens Creek Mine, resulting in transfer of Kennecott's (Rio Tinto) 70.27 percent interest in the project to Hecla. The transaction was completed April 16, 2008, and comprised $700 million in cash and 4.4 million shares of Hecla common stock, which were valued at $53.4 million. Acquisition-related costs amounted to $5.074 million, bringing Hecla Mining Co.'s total transaction cost to $758.46 million.

PRODUCTION

A preliminary estimate of mineral production value in Alaska during 2008 is $2.427 billion. The estimate represents a decrease in value of approximately $940 million, or a 28 percent decrease from 2007 production values of $3.367 billion. Reporting shortfalls are noted in the placer and industrial minerals sectors. There appears to be a fairly significant downturn in sand, gravel, and rock production, although several major rock, sand, and gravel producers declined to contribute their production numbers[3]. Metals (gold, silver, lead, and zinc) account for $2,260 million, coal and peat for $54.99 million, and industrial minerals for $111.76 million. Employment attributed to production in 2008 is estimated to be 2,330 full-time-equivalent positions.

Table 14 shows the estimated mineral production quantity and value for 2006 through 2008. Figures 25, 26, and 27 show the historic production of sand and gravel, gold, and coal. Selected production sites are shown in figure 28.

Allocation of value of production by commodity is shown in figure 29. Zinc leads by far with the most value at 43.48 percent, with Red Dog Mine being the most significant contributor. Gold moved forward to second place at 28.77 percent of total value. In descending order, the value of the remaining products are lead at 11.84 percent, silver at 9.04 percent, industrial minerals at 4.60 percent, and coal and peat at 2.27 percent.

Alaska mineral production value by sector/mine is shown in figure 30.

Table 15 shows the average metal values used in this report over the last 14 years. Some respondents reported unit values received for production and these were used in place of those in the table. 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 producer. Gold and silver showed an appreciation in price in 2008; copper, lead, and zinc depreciated in price.

The reduced mineral production value in 2008 compared to 2007 followed the decline in metals prices that occurred in 2008. Higher gold production was noted, but silver, zinc, and lead production declined. Average gold and silver prices were higher in 2008 than in 2007, but copper, lead, and zinc prices declined. Increases in gold and silver prices were 25 percent and 12 percent, respectively; price decreases in copper, lead, and zinc were 3.5 percent, 19.7 percent, and 42.7 percent, respectively. Appendix D lists Alaskan metal producers.

The production estimates included in this report are from questionnaires returned by miners and mining companies, Native organizations, government agencies, municipalities, and service companies, complemented by telephone queries, emails, 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 (APMAs) submitted to the Division of Mining, Land & Water.

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 and Water,

[3]Alaska Interstate Construction, Metco, others, all historically major producers of rock, sand and gravel, did not participate.

Table 14. Estimated mineral production in Alaska, 2006–2008[a].

	Production Quantities			Estimated Values[b]		
Metals	**2006**	**2007**	**2008**	**2006**	**2007**	**2008**
Gold (ounces)[c]	570,129	726,933	800,752	$ 344,049,779	$ 511,089,447	$ 698,223,883
Silver (ounces)	16,489,394	20,203,985	14,643,735	190,415,907	270,402,055	219,496,408
Copper (tons)	- -	43.8[d]	- -		283,542	
Lead (tons)	157,128	167,181	153,705	183,629,254	389,532,215	287,428,350
Zinc (tons)	673,967	696,115	626,135	2,002,971,414	2,048,451,644	1,055,220,098
Subtotal				**$2,721,066,354**	**$3,219,758,903**	**$2,260,368,739**
Industrial Minerals						
Sand & gravel (million tons)	14.0[e]	14.2	12.5	$ 63,351,089	$ 76,119,390	$ 72,438,792
Rock (million tons)	2.4	2.2	2.5	23,846,024	25,509,775	39,324,787
Subtotal				**$87,197,113**	**$ 101,629,165**	**$ 111,763,579**
Coal (tons)	1,397,500	1,357,000	1,538,000	$ 48,912,500	$ 44,555,140	$ 53,830,000
Peat (cubic yards)	66,500	68,367	83,789	1,057,500	1,085,500	1,159,502
Subtotal				**$ 49,970,000**	**$ 45,640,640**	**$ 54,989,502**
TOTAL				**$2,858,233,467**	**$3,367,028,708**	**$2,427,121,820**

[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 were based on average prices for each year (unless other values were provided by the operator); for 2008--gold $871.96/oz, silver $14.99/oz, lead $0.94/lb, zinc $0.84/lb.
[c]2008 lode production was 743,993 ounces; placer production was 56,759 ounces.
[d]Nixon Fork was the only copper producer in 2007, but did not produce during 2008.
[e]Production corrected from 9.3 million tons.

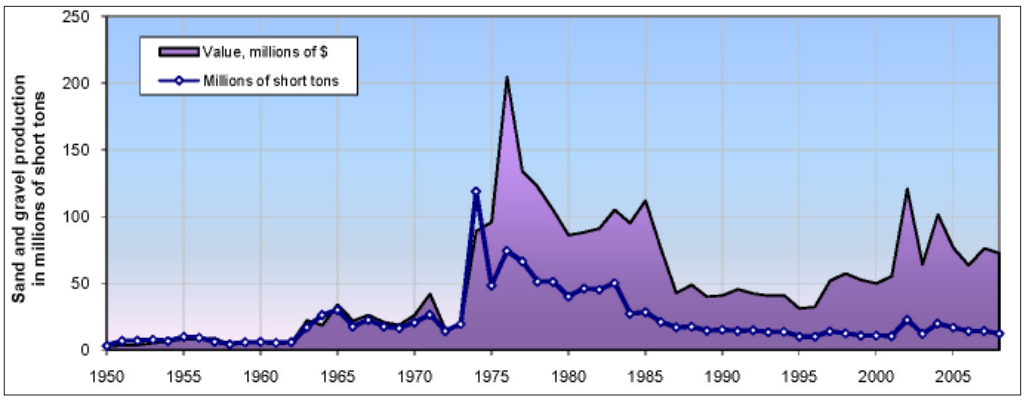


Figure 25. Sand and gravel production in Alaska 1950–2008.

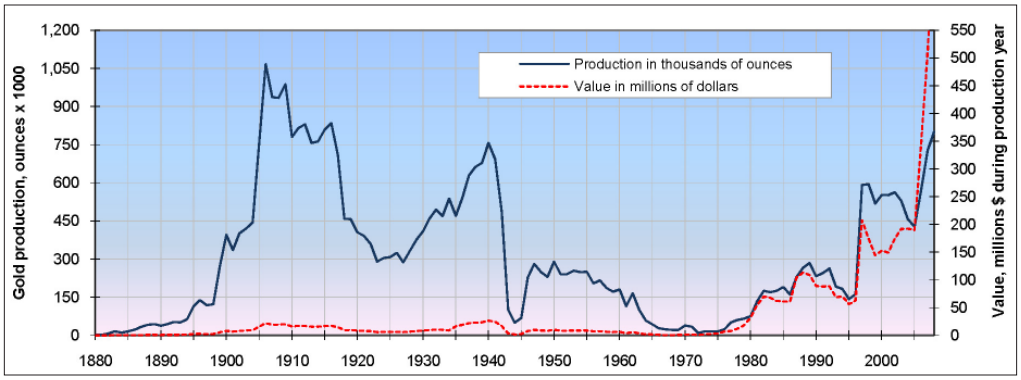


Figure 26. Amount of value of gold production in Alaska, 1880–2008.

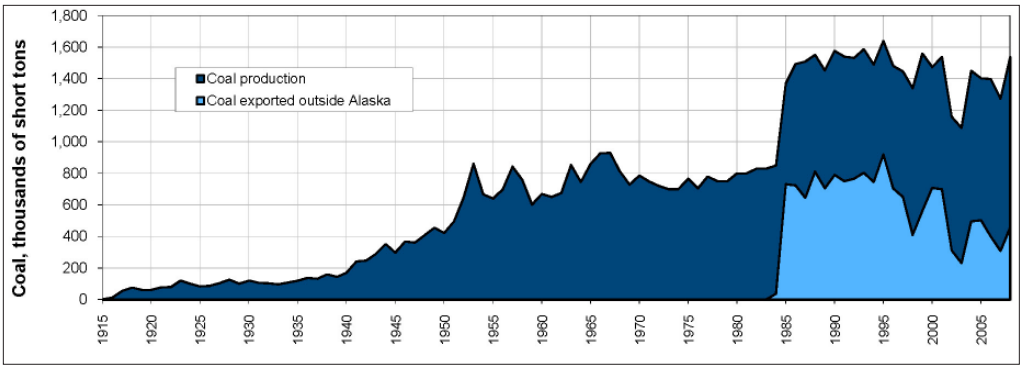


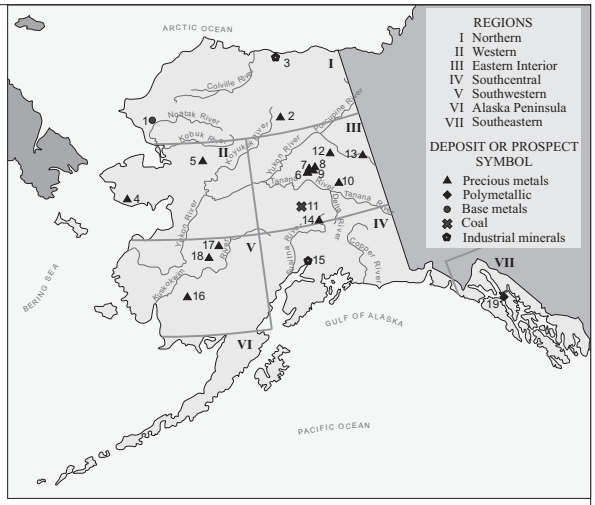
Figure 27. Coal production in Alaska, 1915–2008, including exports to Korea.

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

II Western Region
4. Nome–Placer gold, sand, and gravel
5. Placer gold mines

III Eastern Interior Region
6. Placer gold mines
7. Polar Mining Inc., Fairbanks district–gold, silver, screened aggregate.
8. Fairbanks Gold Mining Inc., Ft. Knox–gold
9. Earthmovers of Fairbanks Inc.–Fairbanks district, gold
10. Teck-Pogo Inc., Pogo Mine–Fairbanks district, gold
11. Usibelli Coal Mine Inc., Bonnifield district–coal
12. Placer gold mines
13. Placer gold mines
14. Placer gold mines

IV Southcentral Region
15. Palmer/Wasilla–Anchorage district–sand and gravel



V Southwestern Region
16. NYAC Mining Co.–gold
17. Placer gold mines
18. Placer gold mines

VI Alaska Peninsula Region

VII Southeastern Region
19. Kennecott Minerals Co/Hecla Mining Co., Greens Creek Mine, Juneau-Admiralty district–silver, zinc, gold, lead

Figure 28. Selected production projects, 2008.

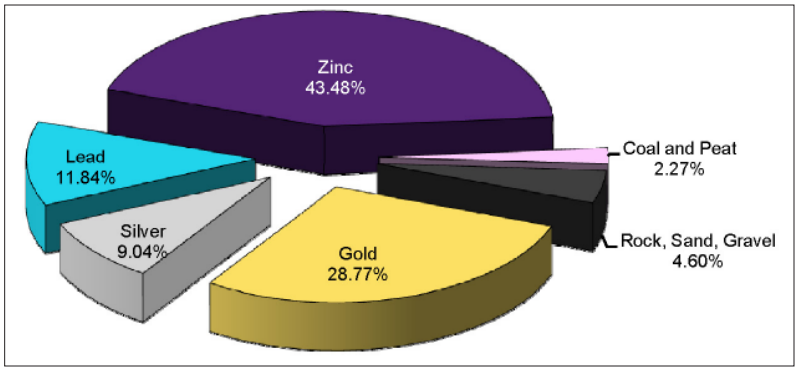


Figure 29. Alaska mineral production value by commodity.

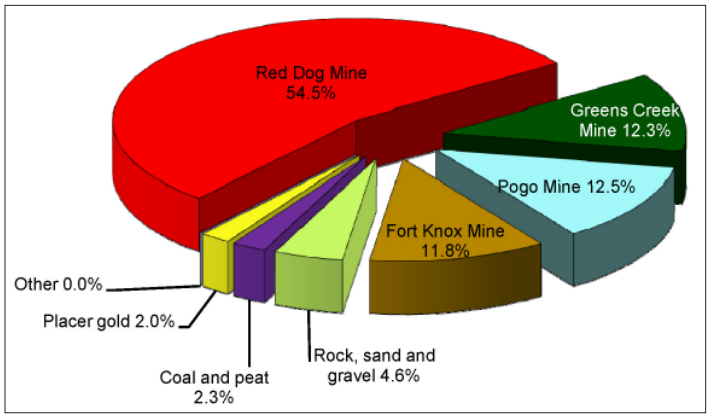


Figure 30. Alaska mineral production by mine or sector, 2008.

Table 15. Average metal prices, 1994–2008.

	Gold $/oz	Silver $/oz	Copper $/lb	Lead $/lb	Zinc $/lb	Percentage Change Gold	Silver	Copper	Lead	Zinc
1994	$386.00	$5.41	$1.05	$0.35	$0.45					
1995	395.00	5.43	1.33	0.34	0.48	2.33	0.37	26.67	-2.86	6.67
1996	387.60	5.19	1.03	0.37	0.49	-1.87	-4.42	-22.56	8.82	2.08
1997	330.76	4.91	1.03	0.28	0.59	-14.66	-5.39	0.00	-24.32	20.41
1998	293.88	5.53	0.75	0.24	0.46	-11.15	12.63	-27.18	-14.29	-22.03
1999	278.70	5.20	0.71	0.23	0.49	-5.17	-5.97	-5.33	-4.17	6.52
2000	279.10	4.96	0.82	0.21	0.51	0.14	-4.62	15.49	-8.70	4.08
2001	271.04	4.37	0.71	0.22	0.40	-2.89	-11.90	-13.41	4.76	-21.57
2002	310.06	4.61	0.41	0.21	0.35	14.40	5.49	0.00	-4.55	-12.50
2003	363.38	4.88	0.81	0.23	0.38	17.20	5.86	14.08	9.52	8.57
2004	409.72	6.67	1.29	0.40	0.47	12.75	36.68	89.26	73.91	23.68
2005	444.74	7.32	1.61	0.43	0.63	8.55	9.75	24.81	7.50	34.04
2006	603.46	11.55	3.02	0.58	1.47	35.69	58.20	87.58	34.88	133.33
2007	695.39	13.38	3.24	1.17	1.47	15.23	15.58	7.14	100.86	0.00
2008	871.96	14.99	3.12	0.94	0.84	25.39	12.00	-3.54	-20.74	-42.73

municipalities, the U.S. Forest Service, the U.S. Bureau of Land Management, Native regional corporations, the City and Borough of Juneau, and the Alyeska Pipeline Service Corp., for providing information for this section of the report.

Tables 16 and 17 show gold production by region of the state, and placer production by small, medium, and large-sized producers. Two placer operations achieved a "large sized" rating in 2008. Hard-rock (lode) gold production increased to approximately 743,993 ounces in 2008 from approximately 673,084 ounces in 2007—a 10.5 percent gain. Placer gold production increased in 2008 by 5.4 percent to 56,759 ounces from 53,849 ounces in 2007. There were approximately 195 placer operations that reported production in Alaska in 2008 compared to 174 in 2007. The increase in hard rock production primarily reflects a higher output from Pogo. The longer range forecast for gold production is very positive, with new projects such as Donlin Creek, Kensington, Pebble, and other hard rock projects being explored.

Tables 18 and 19 show the value of and regional importance of sales of rock, sand, and gravel. Sales of sand and gravel in 2008 totaled 12.46 million tons, down from 2007 at 14.2 million tons. Rock production was 2.47 million tons, up slightly from 2.2 million tons in 2007. These numbers reflect significant shortfalls in reporting. A number of operators declined to report.

The Alaska export value of minerals was $853 million for 2008, 35.23 percent lower than in 2007 at $1,317 million. The total exports include copper–gold concentrates from the Minto Mine in Yukon that were shipped through the terminal in Skagway. See table 20 and figure 31.

Peat resources mined and sold amounted to 83,789 cubic yards in 2008 compared to 68,367 cubic yards in 2007—a 22.6 percent increase in the amount of sales reported. Again, reporting shortfalls are noted for this commodity.

NORTHERN REGION

Northern region estimated production value was $1,345.1 million with an employment of 574 full-time-equivalent positions. Red Dog Mine dominated the production value and employment numbers. Placer gold, sand and gravel, and minor rock production were noted in the region.

Red Dog Mine is in northwestern Alaska, approximately 100 miles north of Kotzebue and 50 miles inland from the Chukchi Sea, at the southern foothills of the Brooks Range. Red Dog is the world's largest zinc producer, both in terms of reserves and annual zinc production; lead and zinc concentrates are trucked to the Delong Mountain terminal on the coast for shipping during the summer. Red Dog Mine dominates Alaska's mineral production value, accounting for approximately 54.5 percent of the total value of Alaska's mineral production in 2008.

Red Dog Mine is 100 percent owned and operated by Teck Cominco Alaska Inc. under an agreement with NANA Regional Corp., a Native Alaskan regional corporation.

The Red Dog deposit comprises a number of sedimentary-hosted exhalative (SEDEX) lead-zinc sulfide deposits hosted in Mississippian-age to Pennsylvanian-age sedimentary rocks. The ore bodies are lens shaped

Table 16. Reported refined gold production, number of operators, and industry employment in Alaska, 2006–2008[a,b].

	Number of operators			Production in ounces			Number of employees[b]		
Region	**2006**	**2007**	**2008**	**2006**	**2007**	**2008**	**2006**	**2007**	**2008**
Northern	20	18	20	1,910	8,555	3,695	40	31	35
Western	41	34	37	14,900	21,904	14,704	58	122	66
Eastern Interior	100	97	103	474,900	621,783	704,334	821	858	877
Southcentral	25	13	25	5,837	1,801	2,424	36	26	47
Southwestern	9	12	11	8,773	4,714	8,197	25	25	18
Alaska Peninsula[c]	1	1	1	-	3	2	-	2	2
Southeastern[d]	5	3	3	63,809	68,173	67,396	255	283	322
TOTAL	**201**	**178**	**200**	**570,129**	**726,933**	**800,752**	**1,235**	**1,347**	**1,367**

[a]2008 production includes 743,993 ounces of gold from hardrock mines and 56,759 ounces of gold from placer sources.
[b]Includes recreation numbers (operators, ounces, employees) 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 Mine numbers in all 2008 categories, which is a polymetallic producer with a strong gold component.

Table 17. Production for selected Alaska placer gold mines, 2001–2008.

	Number of Mines							
Mine Size	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Small[a]	33	43	58	60	50	177	153	169
Medium[b]	5	4	4	5	20	21	19	24
Large[c]	4	2	2	3	1	3	2	2
TOTAL	**42**	**49**	**64**	**68**	**71**	**201**	**174**	**195**
	Production in Ounces[d]							
Small	5,048	9,931	8,124	7,621	6,783	23,343	19,755	19,601
Medium	6,234	4,739	4,976	4,504	17,822	22,144	23,366	27,298
Large	11,559	7,711	10,500	15,950	- -[e]	14,895	10,728	9,860
TOTAL	**22,841**	**22,381**	**23,600**	**28,075**	**24,605**	**60,382**	**53,849**	**56,759**

[a]<650 ounces of gold per year.
[b]650–2,500 ounces of gold per year.
[c]>2,500 ounces of gold per year.
[d]Does not include recreational production before 2006.
[e]2005 production combined with "Medium" producers.

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 mineral processing facilities employ conventional grinding and sulfide flotation methods to produce zinc and lead concentrates. The main pit has an expected life of 4 years at current rates of production.

Additional reserves, referred to as the Aqqaluk deposit, have been identified in the vicinity of the processing facilities. These reserves are sufficient to extend the life of the operation by 15 years for a total mine life of approximately 19 years. Total proven and probable reserve estimates, including the Aqqaluk deposit, as of December 31, 2008 are shown in table 21.

Red Dog Mine's operating profit before depreciation and amortization declined significantly to $240 million in 2008 from $885 million in 2007 and $1.1 billion in 2006. Teck reported an operating profit at the Red Dog Mine of $226.4 million (before depreciation) in 2008 compared to a reported operating profit of $763.2 million in 2007—a 70.3 percent fall. The reduction in 2008 operating profit compared with 2007 was due mainly to the lower realized price of zinc and lead and a 9 percent reduction in zinc sales volumes reflecting the lower production levels. Zinc and lead production in 2008 declined by 10 percent due to lower mill availability, which was reduced by mechanical problems including the failure of a crusher shaft. Site operating costs increased 9 percent over 2007, resulting in a 20 percent increase in unit operating costs due to both higher fuel

Table 18. Reported sand and gravel production and industry employment in Alaska by region, 2008.

Region	Companies and agencies reporting[a]	Tons	Estimated unit value ($/ton)[b]	Total value	Estimated number of employees
Northern	20	2,907,623	$6.67	$19,384,150	62.1
Western	15	641,330	6.49	4,162,630	14.4
Eastern Interior	48	2,466,195	5.16	12,731,613	81.6
Southcentral	43	5,743,381	5.47	31,425,133	103.9
Southwestern	9	551,700	6.73	3,715,300	11.8
Alaska Peninsula	- -	- -	- -	- -	- -
Southeastern	14	151,457	6.73	1,019,966	3.3
TOTAL	**149**	**12,461,686**	**$5.81**	**$72,438,792**	**277**

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

Table 19. Reported rock production and industry employment in Alaska by region, 2008[a].

Region	Companies and agencies reporting[b]	Tons	Estimated unit value ($/ton)[c]	Total value	Estimated number of employees
Northern	1	22,500	$15.00	$ 337,500	1.3
Western	3	125,088	18.33	2,396,313	6.4
Eastern Interior	3	120,474	3.77	1,370,598	7.2
Southcentral	9	404,897	13.55	8,306,929	22.9
Southwestern	4	205,200	11.25	3,080,000	11.6
Alaska Peninsula	0	- -	- -	- -	- -
Southeastern	14	1,592,797	12.86	23,833,448	43.6
TOTAL	**34**	**2,470,956**	**$12.69**	**$39,324,788**	**93**

[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, USBLM, USFS, regional corporations, and others.
[c]Values are based on estimates from producers, from historic records, etc.
- - = Not reported.

Table 20. 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
2007[a]	1,317
2008[a,b]	853

Source: U.S. Census Bureau, Origin of Movement Series.
[a]Includes mineral/metal ores and concentrates, coal, and unwrought, nonmonetary gold exports.
[b]Includes $103 million of copper concentrates produced in Yukon Territory by Sherwood Copper/Capstone Mining and shipped through the Skagway Ore Terminal.

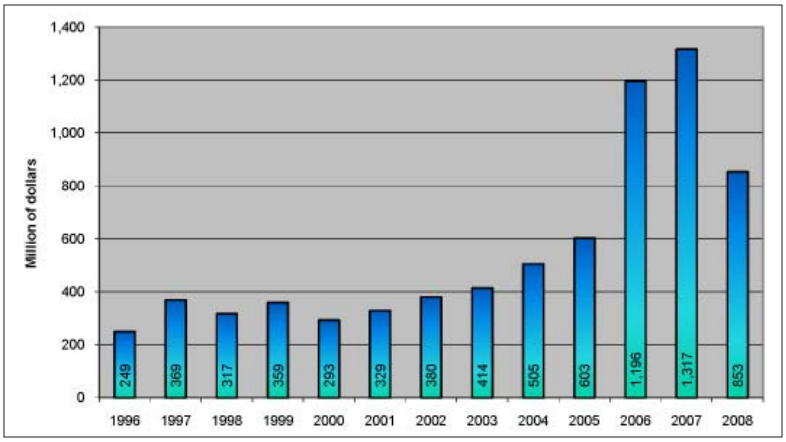


Figure 31. Alaska international mineral exports, 1996–2008.

Table 21. Reserves and resources by category at the Red Dog Mine as of December 31, 2008 (Teck Cominco Ltd. Annual report).

Class	Metal	Category	Tons, millions	Grade, percent
Reserves	Zinc	Proven	10.14	20.0
		Probable	57.52	16.6
	Lead	Proven	10.14	5.4
		Probable	57.52	4.4
Resources	Zinc	Indicated	6.50	20.0
		Inferred	34.16	11.0
	Lead	Indicated	6.50	6.6
		Inferred	34.16	4.0

and supply costs and lower concentrate production. In 2008, the project milled 3.31 million tons of ore with a zinc grade of 20.1 percent, lead grade of 6.0 percent, and silver grade of 3.1 ounces per ton; production values in concentrates amounted to 567,911 tons of zinc, 135,143 tons of lead, and 7.5 million ounces of silver (table 22). In 2007, the project produced 633,511 tons of zinc, 146,152 tons of lead, and was credited with an estimated 11.6 million ounces of silver.

In 2008, $212 million in royalties was paid by Red Dog to NANA. In turn, $122 million was redistributed to other Alaska Native regional and village corporations in accordance with 7i provisions of ANCSA.

Employment at Red Dog Mine complex during 2008 equaled 475 full-time-equivalent employees, including 375 regular employees and 100 contract employees. This is nearly the same as the 459 full-time-equivalent employees in 2007. More than 50 percent of the employees are NANA shareholders.

The shipping season at Red Dog Mine is restricted to approximately 100 days per year because of sea ice conditions, and Red Dog Mine's sales are seasonal with the majority of sales in the last 5 months of each year. Concentrate is stockpiled at the port facility and is typically shipped between July and October. Final tonnages shipped for 2008 were 1,009,800 tons of zinc concentrate and 270,000 tons of lead concentrate. The last vessel of the year departed on October 27, 2008, without a full shipment because of sea ice and adverse weather conditions.

In the third quarter of 2007, the U.S. Environmental Protection Agency withdrew a recently issued renewal of the Red Dog Mine's water discharge permit in the face of an appeal of the permit by a local community group and several environmental organizations. As a result, the permit renewal is expected to form part of the review and approval of a Supplemental Environmental Impact Statement (SEIS). The SEIS will focus on Red Dog's permit renewal and impacts from mining of the Aqqaluk deposit, which is the next ore body scheduled to be developed by Red Dog. Necessary authorizations must be in place prior to 2010 to ensure continuous operation of the mine at current production levels.

Table 22. Red Dog Mine production statistics, 1989–2008[a].

	Tons milled	Ore Grade Zinc (%)	Ore Grade Lead (%)	Ore Grade 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	7.62	457
2007	3,726,910	20.2	6.1	3.1	- -	633,511	146,152	11.55	459
2008	3,306,934	20.1	6.0	3.1	- -	567,911	135,143	7.50	475

[a] Revised 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 from 1990 to 2004 and 2006, as reported credit for 2005, net of treatment charges, calculated at 3.1 oz/ton of ore for 2007.
- - = No concentrate produced.

Minor quantities of rock, sand, and gravel were produced in the northern region in 2008. Employment attributed to this effort amounted to 63 full-time-equivalent positions.

There were approximately 20 placer gold mining operations in the northern region in 2008, employing approximately 35 full-time-equivalent employees. The region was credited with 3,695 ounces of placer gold production.

WESTERN REGION

Thirty-six placer operations, including five recreational in nature, reported production in the region for 2008, compared to 33 and three, respectively, for 2007. Reported production for 2008 was 14,704 ounces of gold, contrasted with a production of 21,904 ounces of gold in 2007. Placer gold employment in 2008 was estimated to be 66 full-time-equivalent positions, compared with 122 for 2007. Reporting shortfalls are noted with most of the commercial recreational services.

Nixon Fork Mine, owned by St. Andrew Goldfields Ltd., was in care and maintenance status during the year. Pacific North West Capital entered an option agreement with St. Andrew to acquire the property, but the deal had not closed during 2008. Subsequently, the deal was consummated; the mine was, in turn, acquired by Fire River Gold from Pacific North West Capital. Our 2009 report will include the specifics of the transaction.

Sand and gravel production in the western region in 2008 was reported to be 638,139 tons from 15 operations compared to 601,645 tons from eight operations in 2007. Employment was estimated to be 14 full-time-equivalent jobs in 2008 compared to 13 full-time-equivalent jobs in 2007.

Rock production was reported at 125,088 tons from three operations in 2008 compared with a reported 177,161 tons from four operations in 2007. Full-time-equivalent jobs during 2008 were estimated to be six, whereas full-time-equivalent jobs during 2007 were estimated to be two.

EASTERN INTERIOR REGION

As in previous years, the eastern interior region was one of the most active regions during 2008. The Fort Knox open-pit gold mine relinquished the leading producer status to Pogo in value of production, but not in number of employees. Total gold production from the region was 704,334 ounces compared to 621,783 ounces

during 2007. Lode gold (hard rock) production of gold amounted to 676,724 ounces compared to 598,279 in 2007. Placer gold production amounted to 27,610 ounces compared to 23,504 during 2007. Rock, sand, gravel, and peat production continued to be an important segment in the Interior; production in 2008 amounted to 2,574,400 tons compared to 4,503,529 tons during 2007.

Fort Knox Mine, operated by Fairbanks Gold Mining Inc., a wholly owned subsidiary of Kinross Gold Corp., produced 329,105 ounces of gold during 2008 (fig. 32). This is a 2.76 percent decrease from 2007's total of 338,459 ounces. Mill throughput for 2008 was 15,110,000 tons compared to 14,021,400 tons in 2007. Average recoverable grade was 0.0219 ounces of gold per ton compared to 0.0241 ounces per ton for 2007.

Figure 32. The control room for milling operations at Fort Knox Mine. Many facets of the milling at the operation are monitored in real time continuously throughout the day. Photo provided by Fairbanks Gold Mining Inc.

Mining activity at the Fort Knox Mine produced 46.30 million tons of material during the year, at an average rate of 126,904 tons per day. Phase 7 stripping was started in the fourth quarter of 2008. Ore was also mined from Phase 6. Ore production averaged 81,918 tons per day during 2008 compared to 60,300 tons per day in 2007; lower-grade materials were stockpiled for future heap leaching. Waste stripping amounted to 16,400,000 tons compared to 23,920,000 tons stripped during 2007. Fort Knox Mine reported 455 full-time-equivalent positions at the end of 2008. The average manpower for the year amounted to 449 full-time-equivalent positions credited to production (table 23). Reserves at Fort Knox as of December 31, 2008 are summarized in table 24.

Pogo Mine is operated as a joint venture with Sumitomo Metal Mining Co. Ltd. (51 percent), Sumitomo Corp. (9 percent), and Teck Cominco Ltd. (40 percent). This underground gold operation is about 90 miles southeast of Fairbanks. It produced 347,219 ounces of gold in 2008 compared to a production of 259,820 ounces in

Table 23. Fort Knox Gold Mine production statistics, 1996–2008.

	Tons Mined (ore + waste)			Tons milled (ore)			Ounces	Employ-
	Fort Knox	True North[a]	Total	Fort Knox	True North[a]	Total	Produced	ment
1996	16,684,000	NA	16,684,000	769,700	NA	769,700	16,085	243
1997	32,380,000	NA	32,380,000	12,163,151	NA	12,163,151	366,223	249
1998	33,294,000	NA	33,294,000	13,741,610	NA	13,741,610	365,320	245
1999	30,350,000	NA	30,350,000	13,819,010	NA	13,819,010	351,120	253
2000	35,600,000	NA	35,600,000	15,000,000	NA	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
2007	45,940,000	- -	45,940,000	14,021,400	- -	14,021,400	338,459	399
2008	46,300,000	- -	46,300,000	15,110,000	- -	15,110,000	329,105	449

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

2007—a 33.6 percent increase (table 25). Teck Cominco is the operator of the mine. Pogo Mine began production in 2006 and produced 113,364 ounces during that startup year.

In 2008, the Pogo mill processed an average of 2,236 tons per day for a total of 818,237 tons for the year. Employment at year end was 287 full-time-equivalent employees and 98 contract employees. Mining in 2009 is budgeted for 900,000 tons of ore; 13,500 feet of lateral development is budgeted. Teck realized its first annual profit from Pogo Mine in 2008, reporting $21.6 million (after pricing adjustments), compared to a loss of $1 million in 2007. Teck reported its 40 percent share of the operating profits before depreciation as $55 million as compared with $16 million in 2007.

Pogo Mine's proven gold reserves are 2,645,527 tons at a grade of 0.48 ounces per ton and a probable reserve of 3,968,320 tons at a grade of 0.42 ounces per ton for a total reserve of 6,613,867 tons at a grade of 0.44 ounces per ton.

Usibelli Coal Mine Inc. continued production of sub-bituminous coal from its Two Bull Ridge site near Healy with an output of 1,538,000 tons of coal, compared to 1,357,000 tons in 2007, a 13 percent increase. The mine supplies six power plants in interior Alaska with approximately 900,000 tons of coal annually; the balance is shipped to non-Alaska locations. Employment was 110 full-time-equivalent persons.

Placer gold production from interior Alaska mines amounted to 27,610 ounces during 2008 from 100 operations of various sizes, an increase of 17.5 percent over production in 2007 of 23,504 ounces from 95 operations of various sizes. Employment estimates for these operations in 2008 is 139 persons; in 2007 an estimated 120 persons were employed in full-time-equivalent placer production in the region.

Industrial minerals continued to be an important sector in the interior region during 2008. Sand and gravel production amounted to 2.47 million tons from 48 operations in 2008 compared with to 4.4 million tons from 24 different operations in 2007. Employment for these operations was approximately 82 full-time-equivalent positions in 2008 compared with 94 positions in 2007. Rock production amounted to approximately 120,474 tons from three operations and created approximately seven full-time-equivalent positions compared with 105,000 tons and approximately six full-time-equivalent positions in 2007. Peat production was reported to be approximately 44,345 bank cubic yards for 2008, an increase of 77 percent over a reported 25,000 bank cubic yards for 2007. The authors surmise there are shortfalls in the reporting of this commodity. Employment for the peat industry was estimated to be approximately five full-time-equivalent positions in 2008 compared to approximately four full-time-equivalent persons in 2007.

SOUTHCENTRAL REGION

Rock, sand, gravel, and peat (topsoil) continue as the most valuable commodities produced for this region. The southcentral region reported 43 sand and gravel operations in 2008 compared to 31 operations reporting for 2007. Sand and gravel production, down by 32.2 percent from the previous year's levels, amounted to 5.74 million tons compared to 7.55 million tons in 2007. Sand and gravel provided 22 percent fewer, or 104 full-time-equivalent jobs compared to 134 jobs in 2007. Rock production in the southcentral region in 2008 more than doubled, and was estimated to be 404,897 tons, reported by nine operations; employment was estimated at 23 full-time-equivalent persons in 2008. This compares to rock production of 198,583 tons and 18 full-time positions in 2007. Reported peat production in 2008 totaled an

Table 24. Reserves at Fort Knox as of December 31, 2008.

Proven			Probable			Total		
Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces
159,297,212	0.0118	1,874,000	119,334,018	0.0162	1,933,000	278,631,230	0.0137	3,807,000

Table 25. Pogo Mine production statistics, 2006-2008.

	Tons Ore Mined	Tons Ore Milled	Ounces of Gold Recovered	Head Grade Recovery, %	oz/ton	Employees[a]
2006	447,129	338,000	113,364	85.0	0.395	477
2007	715,665	715,400	259,820	84.4	0.430	339
2008	882,400	818,237	347,219	83.8	0.506	285

[a]Includes contractor employees; calculated as 11 hour days, 260 employee-days per year.

estimated 39,444 bank cubic yards compared to 43,367 bank cubic yards in 2007. Estimated full-time-equivalent positions associated with peat production in 2008 were one, compared to seven in 2007. Reporting shortfalls are thought to be fairly significant and the actual production could be up to 50 percent above reported numbers.

Placer gold production in the southcentral region in 2008 was estimated to be 2,424 ounces. Placer gold production reported for this region during 2007 was 1,801 ounces. A total of 25 operators reported placer gold production in 2008 compared to 13 in 2007. Six of the operators were recreational in size in 2008 compared to eight in 2007. Total full-time-equivalent employment in 2008 was estimated at 47 positions compared to 26 during 2007. One full-time gemstone operator is included in the placer numbers and no segregation is provided for confidentiality reasons.

SOUTHWESTERN REGION

Placer gold production in the southwestern region amounted to 8,197 ounces in 2008 compared to 4,714 ounces in 2007. Calculated full-time-equivalent employment was 18 in 2008 compared to 25 in 2007. Eleven operators reported production in 2008, compared to 12 operators in 2007. One of the 2008 operations was considered recreational compared with three of the 2007 operations.

Rock, sand, and gravel production was reported from the southwestern region in both 2008 and 2007. Sand and gravel production in 2008 amounted to 551,700 tons and provided 12 full-time-equivalent jobs compared to 319,950 tons and 15 full-time-equivalent jobs in 2007. Rock production in 2008 amounted to 205,200 tons and provided 12 full-time-equivalent jobs compared with 320,250 tons and 18 full-time-equivalent jobs in 2007. Nine sand and gravel and four rock operations provided reports in 2008 compared with four sand and gravel and two rock operations in 2007.

ALASKA PENINSULA REGION

One recreational gold operation was reported in the Alaska Peninsula region in 2008, compared with no production reported for any commodity in 2006 or 2007. This operation produced an estimated 2.3 ounces of gold in 2008. The limited production reported from this area is believed to be due to reporting shortfalls rather than to a lack of production.

SOUTHEASTERN REGION

The southeastern region reported polymetallic, rock, sand and gravel, and placer gold production for 2008. Total minerals industry production employment for the region was 369 full-time-equivalent positions in 2008 compared to approximately 362 in 2007.

Greens Creek Mine, a Kennecott Minerals Co.–Hecla Mining Co. joint venture in southeastern Alaska, is a polymetallic, volcanogenic massive sulfide deposit (silver, zinc, lead, gold, and copper) and is considered the fifth-largest primary silver producer in the world. It produces a silver–gold doré and sulfide concentrates containing zinc and lead. Greens Creek Mine was operated by Kennecott Minerals Co., which owned 70.3 percent; Hecla Mining Co. owned the remaining 29.7 percent. Kennecott and Hecla consummated an agreement to transfer full ownership to Hecla for $750 million (see the Development section for details); the agreement was finalized on April 16, 2008, and Hecla has assumed operation and control of the mine. Greens Creek Mine has produced a total of about 151.2 million ounces of silver and 1.12 million ounces of gold since 1989 and currently has 142 million ounces of silver reserves and resources, with a mine life projected to 2019 (table 26).

Production at Greens Creek Mine was somewhat less in 2008 than in 2007, reflecting a lower grade ore than in previous years. Mill throughput was 734,910 tons in 2008, compared to 732,227 tons in 2007. Metal production in 2008 totaled 7,145,711 ounces of

Table 26. Reserves and resources by category at Greens Creek Mine as of December 31, 2008 (Hecla Mining Co. 2008 annual report).

		Grade			
Class	**Tons**	**Silver oz/ton**	**Gold oz/ton**	**Lead percent**	**Zinc percent**
Probable Reserve	8,064,700	13.7	0.11	3.8	10.5
Mineralized Material	789,800	4.1	0.06	2.0	4.6
Other Resources	2,412,000	11.5	0.09	2.7	6.8
TOTAL	**11,266,500**	**12.56**	**0.10**	**3.44**	**9.29**

silver, 67,269 ounces of gold, 58,224 tons of zinc, and 18,562 tons of lead. Production numbers for 2007 were 8,646,825 ounces of silver, 68,006 ounces of gold, 62,603 tons of zinc, and 21,029 tons of lead (table 27).

Manpower numbers at Greens Creek Mine for 2008 were 317 full-time-equivalent persons in production and 19 in development, for a total of 336. Hecla estimates that it will produce approximately 10 to 11 million ounces of silver in 2009 at a cash cost of $6.00 per ounce, at February 2009 by-product metals and diesel-fuel prices.

Currently, Greens Creek Mine is mining approximately 2,100 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.

Two placer gold operations reported production for 2008, yielding 127 ounces of gold. Calculated employment was five full-time-equivalent positions. This compares to three placer gold operations that reported production for 2007 and yielded 168 ounces of gold with six full-time-equivalent positions.

Rock, sand, and gravel operations in 2008 in the southeastern region produced 151,457 tons of sand and gravel and 1,592,797 tons of rock; fourteen sand and gravel and 14 rock producers reported. This compares to rock, sand, and gravel operations in 2007 in the southeastern region that produced 130,443 tons of sand and gravel and 1,411,190 tons of rock with 26 sand and gravel and nine rock producers reporting. This area reported approximately three full-time-equivalent employees in the sand and gravel sector in 2008 and approximately 44 full-time-equivalent employees in the rock sector. This compares to total employment of 80 in 2007. The southeastern region is the only area with a skewed sand and gravel to rock production ratio; all the remainder have a higher sand and gravel to rock production ratio. Serious shortfalls in reporting are indicated.

Table 27. Greens Creek Mine production statistics, 1989–2008.

			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	717,600	- -	58,350	18,600	- -	72,800	9,700,000	265[d]
2006	732,176	- -	59,429	20,992	- -	62,935	8,865,818	245[e]
2007	732,227	- -	62,603	21,029	- -	68,006	8,646,825	276[f]
2008	734,910	- -	58,224	18,562	- -	67,269	7,145,711	336[g]

[a]No copper credits in 1989–1993 and 2003–2008.
[b]Partial-year production.
[c]No production in 1994 and 1995 due to mine closure.
[d]Fifteen of these employees were assigned to development effort.
[e]Fifty employees were assigned to development and reported in that section's employment.
[f]Forty-five employees were assigned to development and reported in that section's employment.
[g]Nineteen employees were assigned to development and reported in that section's employment.
- - = Not reported.

RECREATIONAL MINING

Interest in recreational mining continues to grow with improved gold prices; however, high fuel prices in the summer of 2008 may have somewhat dampened recreational mining pursuits. 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 commercial ventures, but returns are meager. Production numbers from this sector of the industry are reported in the placer gold production in tables 16 and 17 and are estimated to amount to 368 ounces for 2008 compared to 1,882 ounces for 2007. Employment numbers reported here 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 2008 were estimated at 30, as opposed to the 2007 estimate of 54.

Steve Herschback, Alaska Mining and Diving, has provided an informative website to list recreational mining 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 of and access to 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 (Appendix E).

DRILLING

Drilling was conducted during all phases of mining (exploration, development, and production) on various projects across Alaska during the year. Table 28 lists companies with a significant drilling program in Alaska during 2008, and tables 29 and 30 summarize drilling activity in the state during 2008 by region and type of drilling. Drilling totals for 2008 are 874,634 feet of core drilling, 250,278 feet of reverse-circulation drilling, 26,869 feet of core and reverse-circulation drilling on coal operations, and 1,216 feet of placer churn/auger drilling. Placer churn/auger drilling appears to be underreported, but yearly total footage for placer operations has varied widely over the past decade. About 45 percent of the 2008 drilling footage was from exploration and development projects in the eastern interior region of Alaska and 27 percent of the drilling footage for 2008 was from exploration projects in southwestern Alaska. The 2008 drilling footage decreased almost 1.5 percent from the 2007 value, but remained about 100 percent higher than the drilling total average from 2000 to 2006. Total drilling footage is expected to drop significantly in 2009 due to the global economic downturn.

Major drilling programs were conducted in most areas of the state. Information about significant drilling

Table 28. Companies reporting significant drilling programs in Alaska, 2008.

Alix Resources Corp.
Altair Ventures Inc.
BHP Billiton Ltd.
Bravo Venture Group Inc.
Constantine Metal Resources Ltd.
Donlin Creek JV (Barrick Gold Corp. and NovaGold Resources Inc.)
Freegold Ventures Ltd.
Full Metal Minerals Ltd.
Geohedral LLC
Geoinformatics Exploration Inc.
Goldstrike Mining Corp.
Hecla Mining Co.
International Tower Hill Mines Ltd.
Kinross Gold Corp. (Fairbanks Gold Mining Inc.)
Max Resource Corp.
Millrock Resources Inc.
Niblack Mining Corp.
NovaGold Resources Inc.
Olympic Resources Group LLC
Pacific North West Capital Corp.
Pathfinder Mineral Services
Pebble Limited Partnership (Northern Dynasty Minerals Ltd. and Anglo American plc)
Pure Nickel Inc.
Rubicon Minerals Corp.
Senator Minerals Inc.
Silverado Gold Mines Ltd.
St. Andrew Goldfields Ltd. (Mystery Creek Resources Inc.)
Teck Cominco Alaska Inc.
Teck-Pogo Inc.
Ucore Uranium Inc.
Usibelli Coal Mine Inc.
Zazu Metals Corp.

programs in Alaska during 2008 is summarized in the exploration and development sections of this report.

The Pebble Limited Partnership (Northern Dynasty Minerals Ltd. and Anglo American plc) had the largest drill program in Alaska during 2008, with more than 175,500 feet of core drilling on the Pebble property (fig. 33). The second-largest core drilling program was conducted on the Donlin Creek property. The Donlin Creek LLC drilled a total of 108 HQ/NQ diameter core holes totaling 109,663 feet for exploration, resource infill, condemnation, and geotechnical studies (fig. 34). Teck-Pogo Inc. and Fairbanks Gold Mining Inc. (Kinross Gold Corp.) had large core drilling programs associated with exploration and development work at Pogo Mine and Fort Knox Mine, respectively. Fairbanks Gold Mining Inc. (Kinross Gold Corp.) had the largest reverse-circulation rotary drill program, with drilling related to development and exploration work at Fort Knox Mine and adjacent properties. BHP Billiton Ltd. had the largest coal drilling program, with almost 27,000 feet of exploration drilling at the Western Arctic Coal Project.

Table 29. Drilling footage by region in Alaska, 2008.

Type of drilling	Northern	Western	Eastern interior	South-central	South-western	South-eastern	Alaska Peninsula	Total
Placer subtotal	- -	666	50	- -	500	- -	- -	**1,216**
Coal subtotal	26,869	- -	- -	- -	- -	- -	- -	**26,869**
Hardrock core	97,818	32,100	292,531	23,934	304,739	123,512	- -	**874,634**
Hardrock rotary	1,000	15,212	227,318	- -	6,748	- -	- -	**250,278**
Hardrock subtotal	98,818	47,312	519,849	23,934	311,487	123,512	- -	**1,124,912**
TOTAL (feet)	**125,687**	**47,978**	**519,899**	**23,934**	**311,987**	**123,512**	- -	**1,152,997**

- - = Not reported.
Drill footages do not include sand and gravel drilling.
Coal drilling in all except northern region included in hardrock RVC drill footage to protect confidentiality of information.

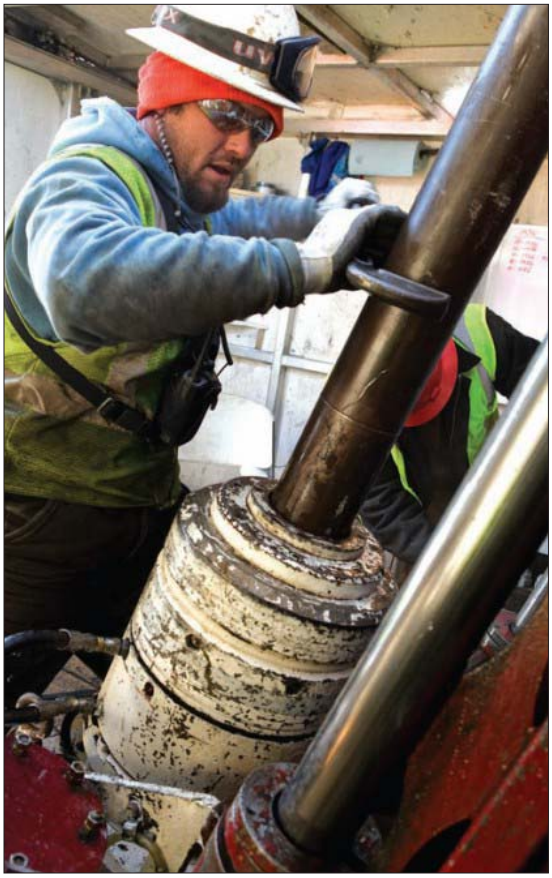


Figure 33. A driller works on a core drill rig at the Pebble project. Drilling was conducted throughout the year on the Pebble East deposit. Photo courtesy of the Pebble Limited Partnership.

Figure 34. A driller arranges core in a core box at the Donlin Creek gold property. Photo provided by Donlin Creek LLC.

Table 30. Drilling footage reported in Alaska, 1982–2008.

Year	Placer Exploration	Placer Thawing	TOTAL PLACER	TOTAL COAL	Hardrock Core[a]	Hardrock Rotary[a]	TOTAL HARDROCK	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	95,600	19,500	115,100	315,250
1988	152,000	300,000	452,000	26,150	223,630	130,230	353,860	832,010
1989	97,250	210,000	307,250	38,670	242,440	89,790	332,230	678,150
1990	78,930	105,000	183,930	18,195	648,600	112,355	760,955	963,080
1991	51,247	130,000	181,247	16,894	205,805	110,850	316,655	514,796
1992	6,740	65,000	71,740	12,875	211,812	148,022	359,834	444,449
1993	25,216	- -	25,216	- -	124,325	127,990	252,315	277,531
1994	21,000	- -	21,000	8,168	347,018	91,692	438,710	467,878
1995	27,570	- -	27,570	- -	363,690	51,795	415,485	443,055
1996	61,780	- -	61,780	8,500	524,330	134,527	658,857	729,137
1997	38,980	- -	38,980	13,998	523,676	180,834	704,510	757,488
1998	33,250	- -	33,250	2,300	505,408	45,670	551,078	586,628
1999	6,727	- -	6,727	- -	369,863	78,934	448,797	455,524
2000	15,480	- -	15,480	- -	418,630	127,638	546,268	561,748
2001	1,100	- -	1,100	36,151	240,318	75,750	316,068	353,319
2002	1,250	- -	1,250	- -	385,290	103,612	488,902	490,152
2003	10,108	- -	10,108	2,000	270,456	100,178	370,634	382,742
2004	107,526	- -	107,526	- -	415,628	36,024	451,652	559,178
2005	3,360	- -	3,360	- -	592,497	41,780	634,277	637,637
2006	8,759	- -	8,759	7,500	765,363	54,173	819,536	835,795
2007	19,575	- -	19,575	50,539	865,478	268,112	1,098,590	1,168,704
2008	1,216	- -	1,216	26,869	874,634	250,278	1,124,912	1,152,997

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

GOVERNMENT ACTIONS

Geologists from the Minerals Resources Section of the Alaska Division of Geological & Geophysical Surveys (DGGS) mapped and sampled approximately 273 square miles in the eastern Bonnifield mining district during a 31-day field season (fig. 35). DGGS had released a 602-square-mile airborne-geophysical survey for the eastern two-thirds of the Bonnifield mining district as part of the State-funded Airborne Geophysical/Geological Mineral Inventory program in 2007. A series of 1:50,000-scale geologic maps and geochemical data will be available in 2010. This project is primarily funded by State Capital Improvement Project (CIP) funds, with supplemental funding through the federal STATEMAP program and State general funds.

DGGS also conducted geologic fieldwork along the proposed gas pipeline corridor between Dot Lake and Tetlin Junction along the Alaska Highway during 2008 (fig. 36). Surficial and bedrock mapping were completed at a scale of 1:63,360. In 2008, DGGS surficial geologists and contractors dug and logged several trenches to determine whether recent surface deposits have been offset by fault movement. Work in 2009 will continue this project from Tetlin Junction to the Yukon Territory–Alaska border.

The State of Alaska, through DGGS, funded, acquired, and published airborne magnetic and electromagnetic geophysical surveys to complete the 710-square-mile Styx River survey area in the northeastern Lime Hills and northwestern Tyonek quadrangles. The State of Alaska, through DGGS, also funded and acquired airborne magnetic and electromagnetic geophysical surveys for the Slate Creek–Slana River area, in the Chistochina mining district covering portions of the Mt. Hayes, Gulkana, and Nabesna quadrangles. The

Figure 35. Joe Andrew, Rainer Newberry, David Szumigala, Jen Athey, and Larry Freeman examine base-metal mineralization at Red Mountain in the eastern Bonnifield mining district. The team toured the area prior to mapping during 2008. Photo by Melanie Werdon.

442-square-mile survey area, between the Richardson Highway on the west and the Tok Cutoff on the east, is about 17 miles east of Paxson and 40 miles southwest of Tok. The surveys were conducted by Fugro Airborne Surveys Corp. and managed by Stevens Exploration Management Corp. The geophysical data are due to be released in mid 2009. These data, along with all historic DGGS publications and most U.S. Geological Survey publications on Alaska, are available for free download at the DGGS website (http://www.dggs.dnr.state.ak.us).

To date, with an investment of $10.4 million, almost 9.25 million acres (more than 14,400 square miles) of Alaska have been flown for detailed geophysical surveys and about 3.0 million acres of 1:63,360- and 1:50,000-scale geologic maps have been produced as part of the State-funded Alaska Airborne Geophysical/Geological Mineral Inventory (AGGMI) Program (table 31). Federal

Table 31. Detailed state airborne geophysical surveys and follow-up geologic ground-truth mapping as of December 2008[a].

Nome District western core area	494 sq. miles	Airborne geophysical survey/ground-truth geologic map
Nyac District core area	183 sq. miles	Airborne aeromagnetic survey
Circle District core area	338 sq. miles	Airborne geophysical survey/ground-truth geologic map
Valdez Creek District	78 sq. miles	Airborne geophysical survey
Fairbanks District	626 sq. miles	Airborne geophysical survey/ground-truth geologic map
Richardson District	137 sq. miles	Airborne geophysical survey
Rampart/Manley-Tofty	1,017 sq. miles	Airborne geophysical survey/ground-truth geologic map
Upper Chulitna District	364 sq. miles	Airborne geophysical survey/ground-truth geologic map
Petersville-Collinsville District	415 sq. miles	Airborne geophysical survey/ground-truth geologic map
Iron Creek District	689 sq. miles	Airborne geophysical survey/ground-truth geologic map
Ruby District	591 sq. miles	Airborne geophysical survey/published geologic map[b]
Fortymile District	1,036 sq. miles	Airborne geophysical survey/ground-truth geologic maps
Livengood District	229 sq. miles	Airborne geophysical survey/ground-truth geologic maps
Salcha River/North Pogo	1,032 sq. miles	Airborne geophysical survey/ground-truth geologic maps
Southeast extension of Salcha River–Pogo	91 sq. miles	Airborne geophysical survey
Liberty Bell	276 sq. miles	Airborne geophysical survey/ground-truth geologic map
Broad Pass	304 sq. miles	Airborne geophysical survey
Council	618 sq. miles	Airborne geophysical survey/ground-truth geologic map
Goodpaster River	210 sq. miles	Airborne geophysical survey/ground-truth geologic mapping (field work completed; map not yet published)
Liscum[c]	67 sq. miles	Airborne geophysical survey
Black Mountain	222 sq. miles	Airborne geophysical survey
East Richardson	224 sq. miles	Airborne geophysical survey
Northeast Fairbanks	404 sq. miles	Airborne geophysical survey/ground-truth geologic mapping (field work completed; map not yet published)
Alaska Highway Corridor[d]	3,045 sq. miles	Airborne geophysical survey/ground-truth geologic mapping (field work completed; map not yet published)
Bonnifield District	602 sq. miles	Airborne geophysical survey/ground-truth geologic mapping (field work completed; map not yet published)
Styx River[e]	710 sq. miles	Airborne geophysical survey (released 2008)
Slate Creek–Slana River	442 sq. miles	Airborne geophysical survey (to be released mid 2009)
TOTAL 16 years $10.4 million	**14,444 sq. miles**	**2.53% 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]DGGS published a geologic map of the Ruby–Poorman mining district based on mapping in 1984 by the Anaconda Minerals Co.
[c]Project funded through agreement with AngloGold Ashanti (USA) Exploration Inc.
[d]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.
[e]Project partially funded through agreement with Anglo American Exploration (USA) Inc. under the DGGS Mineral Industry Sponsorship Program.
Note: Surveys listed above are complete except where noted. Additional areas will be scheduled for surveying at later dates contingent on future funding.

Figure 36. Rainer Newberry examines metamorphic rocks exposed along a ridge between the Robertson River and Sheep Creek as part of geologic studies along the Alaska Highway. Photo by David Szumigala.

monies from the U.S. Geological Survey's STATEMAP Program fund some of the geologic mapping within the AGGMI Program.

Table 32 shows the geophysical surveys flown in Alaska that were funded largely by federal monies through the U.S. Bureau of Land Management. The western Fortymile survey was released, through DGGS, in 2008.

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

The DGGS Geologic Materials Center received mineral industry samples and data during the year. The Bristol Bay Native Corp. donated core from 14 drill holes at the Kemuk iron–titanium–platinum prospect in

Table 32. Detailed federally funded airborne geophysical survey work as of December 2008[a].

Wrangell/Stikine[b]			1,111 sq. miles	Airborne geophysical survey
Koyukuk/Wiseman			533 sq. miles	Airborne geophysical survey
Ketchikan[c]			605 sq. miles	Airborne geophysical survey
Aniak			1,240 sq. miles	Airborne geophysical survey
Delta River			603 sq. miles	Airborne geophysical survey
Sleetmute			641 sq. miles	Airborne geophysical survey
Howard Pass–Misheguk Mountain			1,447 sq. miles	Airborne geophysical survey
Western Fortymile			250 sq. miles	Airborne geophysical survey (released 2008)
TOTAL	**9 years**	**$4.0 million**	**6,430 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.

southwestern Alaska. Calista Corp. donated core and soil samples from the Nyac gold property in southwestern Alaska.

In January 2007, the Alaska Industrial Development and Export Authority (AIDEA) executed a 7-year user agreement with Sherwood Copper Corp. and began constructing the new Skagway ore terminal concentrate storage building and support structures. In October 2007, for the first time in 10 years, mineral concentrates were loaded and shipped from the reactivated Skagway ore terminal. In 2008, AIDEA continued active discussions with other mining companies for potential use of the Skagway ore terminal; the Skagway Port facility was subsequently expanded by AIDEA at a cost of $2.6 million. The expansion added 15,000 square feet of new storage capacity. The Minto Mine shipped approximately 31,600 dry tons of ore concentrate through the terminal in 2008. The Minto Mine will be able to store and load larger lots and take advantage of lower shipping rates with the expanded terminal capacity. Capstone Mining Corp. (formerly Sherwood Copper Corp.) signed an addendum to their original Agreement for Ore Storage and Loading Facilities with AIDEA under which the costs of the expansion will be repaid on the same terms as the original agreement.

Redcorp Ventures Ltd. applied for use of the Skagway ore terminal facilities in 2007. A Reimbursement Agreement for due diligence was approved by AIDEA's Board of Directors in October 2008. Redcorp has postponed executing the agreement.

On May 27, 2008, Alaska Governor Sarah Palin presented businesses, international organizations, and an elementary school with the first Governor's North Star Awards for International Excellence. Sumitomo Metal Mining Corp. was given the Governor's award for foreign investment in Alaska. Sumitomo Metal Mining Co., Ltd., in partnership with Teck Cominco, established Pogo Mine in Interior Alaska. The initial capital expenditure at Pogo was $378 million, and Sumitomo's investment in Alaska spanned 11 years of exploration, permitting, development, and construction.

The Alaska Railroad made $12.6 million in net income during 2008 from total revenue of $180.4 million. Freight amounted to $96.3 million of the total revenue, with mineral products (coal, sand, and gravel) revenue amounting to $18.5 million, 19.2 percent of total freight revenues for the year. Mineral products revenue was up in 2008 compared to 2007 at $14.8 million (16.3 percent of total freight revenue in 2007). Total freight tonnage, the railroad's core business, was 6.1 million tons including 2.83 million tons of gravel. The gravel activity amounted to 28,309 train-car loads and was a 19 percent increase over gravel tonnage hauled in 2007. The railroad hauled more than 600,000 tons of coal from Usibelli Coal Mine to the Seward port. Chile was the largest export customer in 2008, but test shipments also went to Japan, China, and South Korea. The railroad also completed developing the Curry quarry in southcentral Alaska and produced 200,000 tons of ballast rock and 60,000 tons of rip-rap rock material.

Five draft ballot "citizen initiatives" that potentially would have negatively impacted the Alaska mineral industry were certified and support signatures were gathered during late 2007 and 2008. The draft initiatives included 07WTR, "The Alaska Clean Water Initiative," to limit the use of water, chemical, and discharges by industry; 07WTR2 to not allow state agencies to issue permits for use of water and chemicals and discharges by industry; 07FISH, "Fisheries Habitat Protection Initiative," to move Division of Habitat from DNR to Department of Fish & Game; 07WIFI, "Protect Wild Fish From Pollution Initiative," to eliminate use of mixing zones for large metal mines; and 07WTR3, "The Alaska Clean Water Initiative (III)," to not allow state agencies to issue permits that "could," directly or indirectly, result in release of toxic pollutants. Governor Palin moved the Division of Habitat back to the Alaska Division of Fish & Game, thereby negating proposed ballot initiative 07FISH. The initiatives 07WTR and 07WTR3 collected enough support signatures to be certified for ballot in March for the 2008 fall ballot. Initiative 07WTR was written as a more restrictive proposal than initiative 07WTR3. Fairbanks Superior Court Judge Blankenship ruled that 07WTR was unconstitutional and the Alaska Supreme Court upheld that decision. The Alaska Supreme Court ruled that initiative 07WTR3 could be placed on the August 26 ballot.

The vote came after a lengthy, contentious advertising campaign by groups on both sides of the issue, resulting in the most expensive initiative process in Alaska history. The ballot measure failed by a more than 14 percent margin, with 71,759 ballots supporting the measure and 95,660 ballots cast against the measure.

The U.S. Geological Survey conducted limited field studies at a number of locations across Alaska during 2008. Geologic mapping and geochemical sampling were conducted in the Taylor Mountains Quadrangle as the final field portion of a 4-year study. A USGS team also conducted limited field studies including geological mapping and geochemical sampling in the Fortymile mining district during 2008, studying carbonate replacement and skarn mineralization.

On April 28, 2008, the Commissioner of the Department of Natural Resources adopted the Southeast Susitna Area Plan. The plan establishes land use designations, management intent, and management guidelines for more than 250,000 acres of state uplands, shorelands, and tidelands in the lower Susitna Valley. This plan su-

persedes the 1982 Willow Sub-Basin Area Plan; a portion of the South Parks Highway Subregion of the Susitna Area Plan (1985); the Deception Creek Land Use Plan (1989); and the Kashwitna Management Plan (1991).

On October 31, 2008, the Commissioner of the Department of Natural Resources (DNR) adopted the Northwest Area Plan (NWAP) with the date of issuance as November 7. The plan establishes land use designations, management intent, and management guidelines for 13.5 million acres of state uplands and shorelands, and 5.5 million acres of tide and submerged lands in the area from Point Lay to Saint Michael in northwestern Alaska. This plan supersedes the 1989 Northwest Area Plan.

DNR Resource Assessment and Development Section staff began studies to revise the Yukon–Tanana Area Plan. The area covered by the proposed plan was the western portion of the Tanana Basin Area Plan. The existing area plan was adopted in 1985 and updated in 1991. The proposed plan encompasses more than 15 million acres of state-owned and non-state-owned land. DNR staff also began studies for the companion Eastern Tanana Area Plan. This plan contains approximately 6.5 million acres of general state-owned and state-selected lands. The area of eastern Interior Alaska covered by these plans has numerous mineral resources and many areas of high mineral potential.

The U.S. Bureau of Land Management (BLM) began studies to update the federal Eastern Interior Plan. The planning area is somewhat triangular in shape and is located to the east of Fairbanks, running south of the Brooks Range to the Canadian border and generally bounded on the south by the Richardson and Alaska highways. The plan area includes about 8 million acres of federally managed lands. This planning area includes the White Mountain National Recreation Area, three Wild and Scenic Rivers, the Steese National Conservation Area, two wildlife refuges, the Yukon–Charley Rivers National Preserve, and many villages. White Mountains and the Steese will require their own Record of Decision within this overall planning process. The plan will only develop guidance for BLM-managed lands within the larger geographic area. BLM intends to prepare a Resource Management Plan (RMP) with an associated Environmental Impact Statement (EIS) for the Eastern Interior Planning Area. The RMP will replace the existing Steese National Conservation Area Resource Management Plan, the White Mountains National Recreation Area Resource Management Plan, and the Fortymile Management Framework Plan. The RMP will also make land use decisions on previously unplanned public lands in the Upper Black River subunit. The major issues or management concerns that will be addressed in this planning effort include management of recreational use, off-highway vehicles and access, minerals and energy resources, land tenure and realty, wild and scenic rivers, wildlife and fisheries, and subsistence use.

The Bureau of Land Management (BLM) announced on March 21, 2008, the availability of the Record of Decision for the Ring of Fire Resource Management Plan (RMP). The Ring of Fire planning area includes 1.3 million acres of BLM-administered public land in southeastern and southcentral Alaska, Kodiak Island, and the Aleutian Islands. The BLM deferred the final determination on the establishment of an Area of Critical Environmental Concern (ACEC) for federal lands near Haines.

The Bureau of Land Management (BLM) announced the availability of the Record of Decision (ROD) for the Kobuk–Seward Peninsula Resource Management Plan (RMP) on September 4, 2008. The Kobuk–Seward Peninsula planning area includes 11.9 million acres of BLM-administered public land and mineral estate in northwestern Alaska. The Kobuk–Seward Peninsula Approved RMP is essentially the same as Alternative D in the Proposed RMP/Final EIS, published in September 2007.

On November 14, 2008, the BLM announced the availability of the Record of Decision for the Bay Resource Management Plan (RMP). The 23-million-acre Bay planning area includes approximately 1.9 million acres of BLM-administered public land and resources in the Bristol Bay and Goodnews Bay regions of southwestern Alaska. The Bay Approved RMP is essentially the same as the Proposed RMP issued in December 2007, with minor modifications added for clarification. The approved plan designates one Area of Critical of Environmental Concern, located at Carter Spit in the Goodnews Bay area. The plan also recommends the revocation of all Alaska Native Claims Settlement Act (ANCSA) Section 17(d)(1) withdrawals in the planning area. Future exploration and development on these lands would be guided by conditions outlined in the plan.

The State of Alaska asserted that Little Scottie Creek, in the Tanana River region of eastern Alaska, was navigable. At the time of statehood, title to unreserved lands underlying navigable waters vested with the State of Alaska under the Equal Footing Doctrine and the Submerged Lands Act of 1953; therefore the State received title to the submerged lands. The BLM analyzed the evidence the State submitted and prepared a summary report on the relevant facts for public review. A decision accepting the State's application was issued on July 7, 2008. BLM Alaska State Director Thomas P. Lonnie signed a disclaimer of interest on September 9, 2008.

The U.S. Environmental Protection Agency (EPA) is evaluating a request from the State of Alaska Department of Environmental Conservation (ADEC) to run

the National Pollutant Discharge Elimination System (NPDES). The NPDES program would give the state environmental regulators the ability to write wastewater discharge permits for local business and industry, as well as enforce those permits to ensure compliance. Alaska is among a handful of states that do not currently possess water-quality permitting authority for local waters. Forty-five other states have already received permission from EPA to run the program. Upon approval, Alaska plans to phase in implementation of the NPDES Program over three years. EPA will continue to write permits for those facilities that Alaska does not take on during this period.

The EPA Regional Administrator, Elin D. Miller, notified the Governor of Alaska that certain areas of Alaska do not meet the agency's new daily standards for fine particle pollution, also known as fine particulate matter, or PM2.5. Alaska will be required to take steps to reduce the pollution that forms these particles. A small portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, is being designated as a PM2.5 nonattainment area. Based on EPA's analysis, Fairbanks local heating emissions from woodstoves, distillate oil, industrial sources, and mobile emissions contribute to primary and secondarily formed PM2.5 that violate the standard during stable weather events associated with extremely strong temperature inversions. A small portion of the City and Borough of Juneau, and the Mendenhall Valley, is being designated as a PM2.5 nonattainment area. This area was designated based on 2005–2007 data from the Mendenhall Valley PM2.5 monitor. Based on EPA's analysis, Juneau local heating emissions from woodstoves and fireplaces contribute to the violations of the standard during stable weather events associated with strong temperature inversions.

APPENDIX A
New claims staked in Alaska 2004-2008

Quad no.	Quadrangle name[a]	New federal mining claims 2004	2005	2006	2007	2008	New state mining claims 2004	2005	2006	2007	2008[b]
18	De Long Mountains	0	0	0	0	0	0	0	0	0	
23	Philip Smith Mountains	0	0	0	0	0	0	0	0	0	
26	Noatak	0	0	0	0	0	0	0	0	0	
27	Baird Mountains	0	0	0	0	0	60	20	260	4	
28	Ambler River	0	0	0	0	0	0	313	15	57	
29	Survey Pass	0	0	0	0	0	0	68	68	44	
30	Wiseman	16	14	250	134	6	0	13	0	4	12
31	Chandalar	16	25	30	0	3	24	13	68	173	
36	Selawik	0	0	0	0	0	0	0	0	0	
38	Hughes	0	0	0	0	0	3	0	0	20	
39	Bettles	0	12	7	0	26	0	0	0	0	
43	Teller	0	0	0	0	0	0	36	80	111	
44	Bendeleben	0	0	0	0	0	194	55	405	632	500
45	Candle	0	0	0	0	0	172	148	178	8	
47	Melozitna	0	0	0	0	0	0	0	28	0	
48	Tanana	0	0	0	0	0	53	45	46	52	
49	Livengood	0	0	0	0	0	117	89	125	41	36
50	Circle	0	0	0	0	0	99	126	147	101	
51	Charley River	0	0	0	0	0	0	0	2	2	
52	Nome	0	0	0	0	0	9	7	57	31	
53	Solomon	0	0	0	9	0	3	48	56	25	
55	Nulato	0	0	0	0	0	0	69	0	0	
56	Ruby	0	0	0	0	0	9	0	9	15	
58	Fairbanks	0	0	0	0	0	102	70	96	61	23
59	Big Delta	0	0	0	0	0	631	988	2,218	153	
60	Eagle	0	0	0	0	0	113	230	257	589	
64	Ophir	0	0	0	0	0	42	1	0	61	20
65	Medfra	0	0	0	0	0	0	0	12	33	
67	Healy	0	0	0	0	0	111	149	47	271	
68	Mt. Hayes	24	253	0	4	0	156	84	429	127	
69	Tanacross	0	0	0	0	0	33	0	34	410	140
73	Iditarod	0	0	0	0	0	213	1	589	302	178
74	McGrath	0	0	0	0	0	142	0	139	72	
75	Talkeetna	0	0	0	0	0	166	178	383	62	10
76	Talkeetna Mountains	0	0	0	0	0	33	234	65	72	
77	Gulkana	0	0	0	0	0	0	0	103	85	
78	Nabesna	0	0	0	0	0	0	1	0	56	
81	Russian Mission	0	0	0	0	0	0	0	160	0	
82	Sleetmute	0	0	0	0	0	0	6	25	753	
83	Lime Hills	0	0	0	0	0	32	271	122	281	156
84	Tyonek	0	0	0	0	0	597	113	125	81	
85	Anchorage	0	0	0	0	0	75	80	72	66	
86	Valdez	0	0	0	0	0	3	1	48	1	
91	Bethel	0	0	0	0	0	0	8	154	516	
92	Taylor Mountains	0	0	0	0	0	87	26	55	10	
93	Lake Clark	0	0	0	0	0	267	866	87	831	
95	Seward	10	18	13	29	26	18	7	12	18	
96	Cordova	0	0	0	0	0	0	0	0	0	
101	Goodnews Bay	0	0	0	0	0	12	0	0	0	
102	Dillingham	0	0	0	0	0	5	147	0	99	
103	Iliamna	0	0	0	0	0	944	318	26	171	
104	Seldovia	0	0	0	0	0	3	0	0	0	
105	Blying Sound	0	0	0	0	0	0	0	0	4	

Quad no.	Quadrangle name[a]	New federal mining claims 2004	2005	2006	2007	2008	New state mining claims 2004	2005	2006	2007	2008[b]
108	Yakutat	0	0	0	0	2,383	0	0	0	41	
109	Skagway	0	0	0	0	0	0	4	20	100	
112	Juneau	0	0	1	67	199	6	2	7	0	
114	Sitka	0	0	0	9	0	0	0	0	1	
115	Sumdum	0	0	0	0	40	0	0	0	0	
116	Port Alexander	0	0	0	0	2	0	0	0	0	
117	Petersburg	0	1	54	23	0	0	0	0	0	
118	Bradfield Canal	0	0	0	0	1	0	0	0	0	
119	Craig	0	83	94	365	64	0	2	0	0	
120	Ketchikan	0	0	0	0	0	2	0	0	0	
121	Dixon Entrance	0	13	8	293	176	0	0	0	0	
122	Prince Rupert	0	0	0	0	75	0	0	0	0	
128	Bristol Bay	0	0	0	0	0	0	10	0	0	
129	Ugashik	0	0	0	0	0	0	0	16	0	
130	Karluk	0	0	0	0	0	18	0	0	0	
131	Kodiak	0	0	0	0	0	0	1	0	0	
133	Chignik	0	0	0	0	0	41	6	0	0	
135	Trinity Islands	0	0	0	0	0	8	383	13	1	
136	Kaguyak	0	0	0	0	0	0	71	0	0	
TOTALS		**66**	**419**	**457**	**933**	**3,001**	**4,603**	**5,308**	**6,858**	**6,648**	**1,075**

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 2004 and 2008.

[b]State mining claim information is estimated and is not complete. Numbers of new claims, where known, are shown; however, many quadrangles showing no claims most likely do have new claims, but the number was not available at press time. Figures will be updated when information is available.

APPENDIX B
Prospecting sites in Alaska 2002–2008

Quad no.	Quadrangle name[a]	2002 New	2002 Total	2003 New	2003 Total	2004 New	2004 Total	2005 New	2005 Total	2006 New	2006 Total	2007 New	2007 Total	2008 New	2008 Total
18	De Long Mountains	0	91	0	91	0	91	0	91	0	91	0	91	0	u
26	Noatak	0	1	0	0	0	0	0	0	0	0	0	0	0	u
27	Baird Mountains	0	22	0	22	0	22	0	22	0	22	0	22	0	u
30	Wiseman	0	13	0	2	0	2	0	2	0	2	0	2	0	u
31	Chandalar	0	11	0	11	0	11	0	11	0	11	0	11	0	u
36	Selawik	0	7	0	7	0	7	0	7	0	7	0	7	0	u
38	Hughes	0	8	0	8	0	8	0	8	23	31	0	31	0	u
41	Fort Yukon	0	0	0	0	0	0	0	0	0	0	0	0	0	u
43	Teller	0	15	0	0	0	0	0	0	0	0	0	0	0	u
44	Bendeleben	0	31	0	31	0	31	0	31	0	31	0	31	0	u
45	Candle	0	32	0	0	0	0	0	0	0	0	0	0	0	u
47	Melozitna	0	0	0	0	0	0	0	0	0	0	0	0	0	u
48	Tanana	0	30	4	8	0	7	12	19	1	16	0	14	0	u
49	Livengood	7	14	7	21	0	21	3	24	0	17	0	17	0	u
50	Circle	9	91	1	68	0	67	3	70	3	72	0	72	0	u
52	Nome	0	74	0	38	0	38	0	38	0	38	0	26	0	u
53	Solomon	0	13	1	14	0	14	0	14	0	13	0	13	0	u
55	Nulato	0	16	0	2	0	2	0	2	0	2	0	2	0	u
56	Ruby	0	3	0	3	0	3	0	3	0	3	0	3	2	u
57	Kantishna River	0	4	0	4	0	4	0	4	0	4	0	4	0	u
58	Fairbanks	2	17	10	26	19	45	0	45	9	54	1	36	13	u
59	Big Delta	0	557	1	511	20	177	39	216	1	216	1	204	0	u
60	Eagle	1	108	0	32	5	37	1	38	0	38	2	38	0	u
64	Ophir	0	181	0	181	1	106	0	106	0	106	0	106	0	u
65	Medfra	0	1	2	3	0	3	0	3	0	1	0	1	0	u
67	Healy	0	26	0	26	8	34	0	34	8	42	0	34	8	u
68	Mt. Hayes	0	239	33	272	2	274	0	274	0	241	0	240	0	u
69	Tanacross	2	2	0	2	0	2	0	2	4	6	40	46	0	u
73	Iditarod	3	152	0	152	0	152	0	152	0	152	0	144	0	u
74	McGrath	0	57	0	5	2	7	0	7	0	7	0	5	0	u
75	Talkeetna	27	79	0	54	0	54	0	54	0	54	0	54	0	u
76	Talkeetna Mountains	4	52	38	86	2	88	66	154	26	164	9	173	0	u
77	Gulkana	0	3	0	3	0	3	0	3	0	3	0	3	0	u
78	Nabesna	0	4	0	4	0	4	0	4	0	4	0	4	0	u
81	Russian Mission	0	46	0	46	0	46	0	46	0	46	0	46	0	u
82	Sleetmute	0	26	0	26	0	26	0	26	0	26	0	26	0	u

Quad no.	Quadrangle name[a]	2002 New	2002 Total	2003 New	2003 Total	2004 New	2004 Total	2005 New	2005 Total	2006 New	2006 Total	2007 New	2007 Total	2008 New	2008 Total
84	Tyonek	0	0	4	4	0	4	0	4	0	0	0	0	0	u
85	Anchorage	1	56	0	53	0	53	4	57	0	57	2	59	0	u
86	Valdez	0	41	0	26	0	26	0	26	0	26	0	26	0	u
91	Bethel	0	0	0	0	0	0	0	0	28	28	0	28	1	u
95	Seward	0	0	0	0	0	0	0	0	0	0	0	0	0	u
104	Seldovia	0	1	0	1	0	1	0	1	0	1	0	1	0	u
105	Blying Sound	0	0	0	0	0	0	0	0	0	0	2	2	0	u
117	Juneau	0	5	0	5	0	5	0	5	0	5	0	5	0	u
128	Trinity Islands	5	5	0	5	0	5	0	5	0	5	0	5	0	u
136	Craig	0	4	0	4	0	4	0	4	0	4	0	4	0	u
TOTALS		**61**	**2,138**	**101**	**1,857**	**59**	**1,484**	**128**	**1,612**	**103**	**1,646**	**57**	**1,642**	**24**	**651**

[a]Unlisted quadrangles did not have any prospect sites staked during 2001–2008.

u - Unknown; data not available at press time. Figures will be updated when information is available.

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.

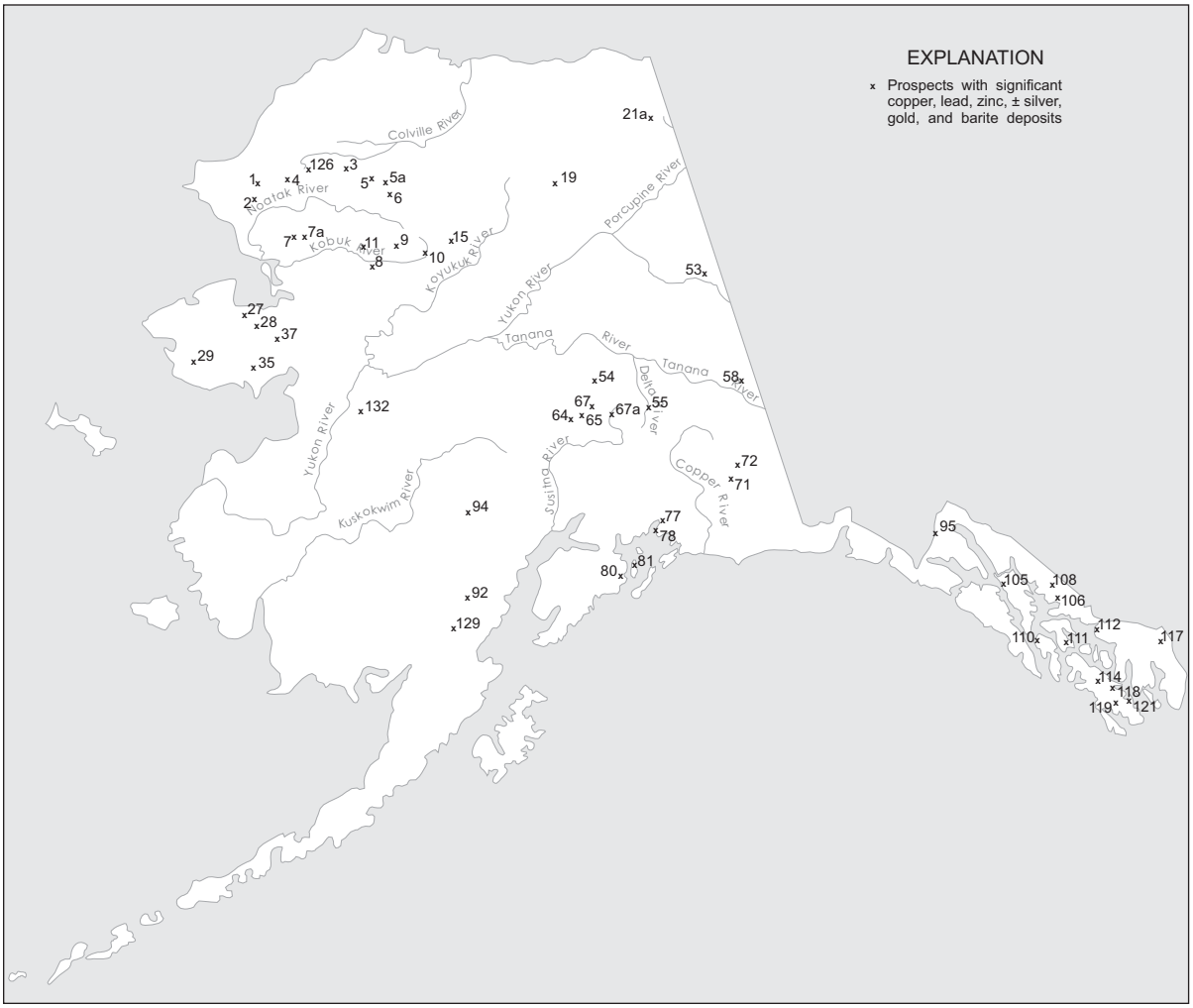


Figure C-1. Significant copper, lead, zinc with credits of silver, gold, and barite deposits in Alaska, 2008.

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-

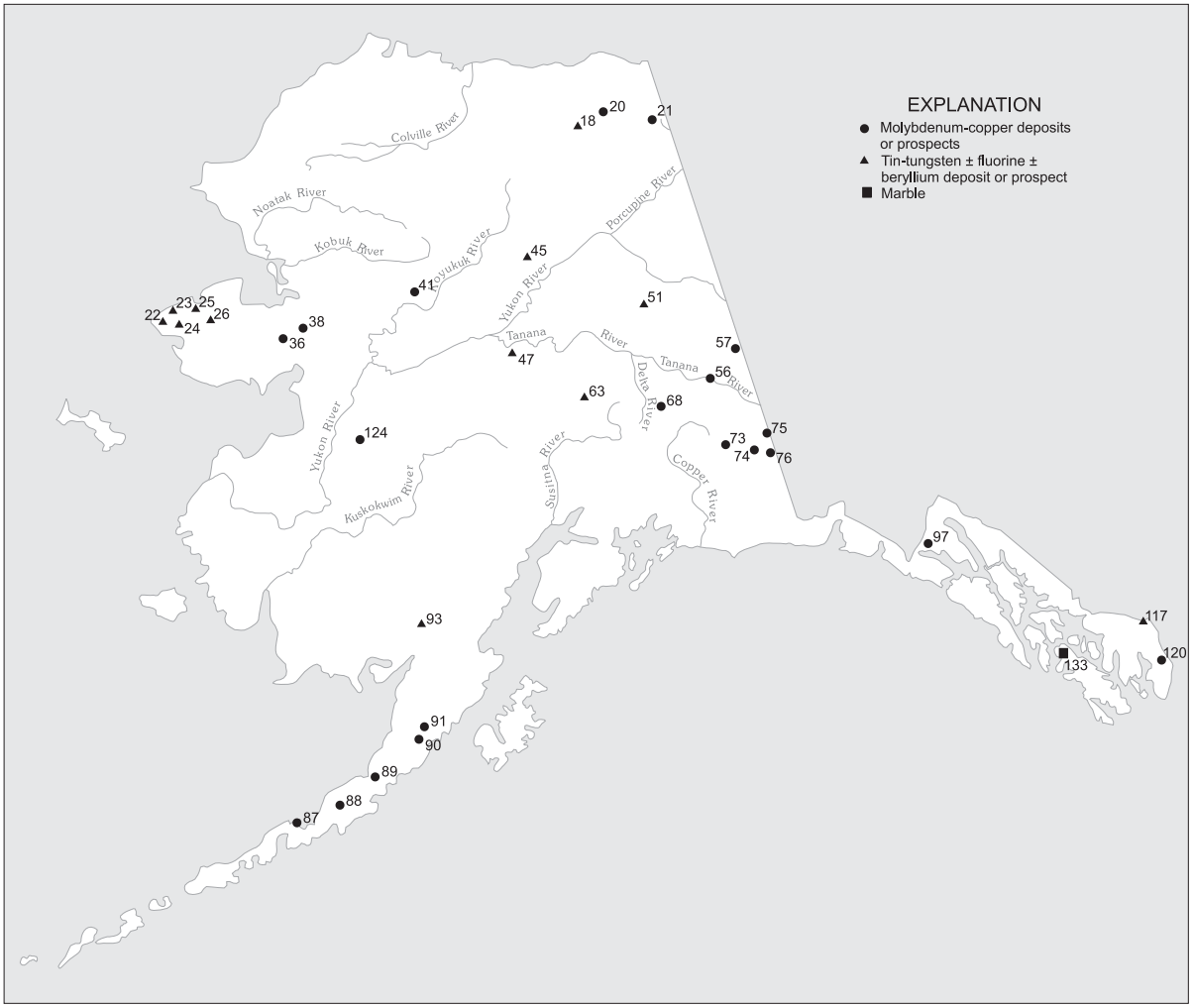


Figure C-2. Significant molybdenum–copper and tin–tungsten with credits of fluorite and beryllium deposits in Alaska, 2008.

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).

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;

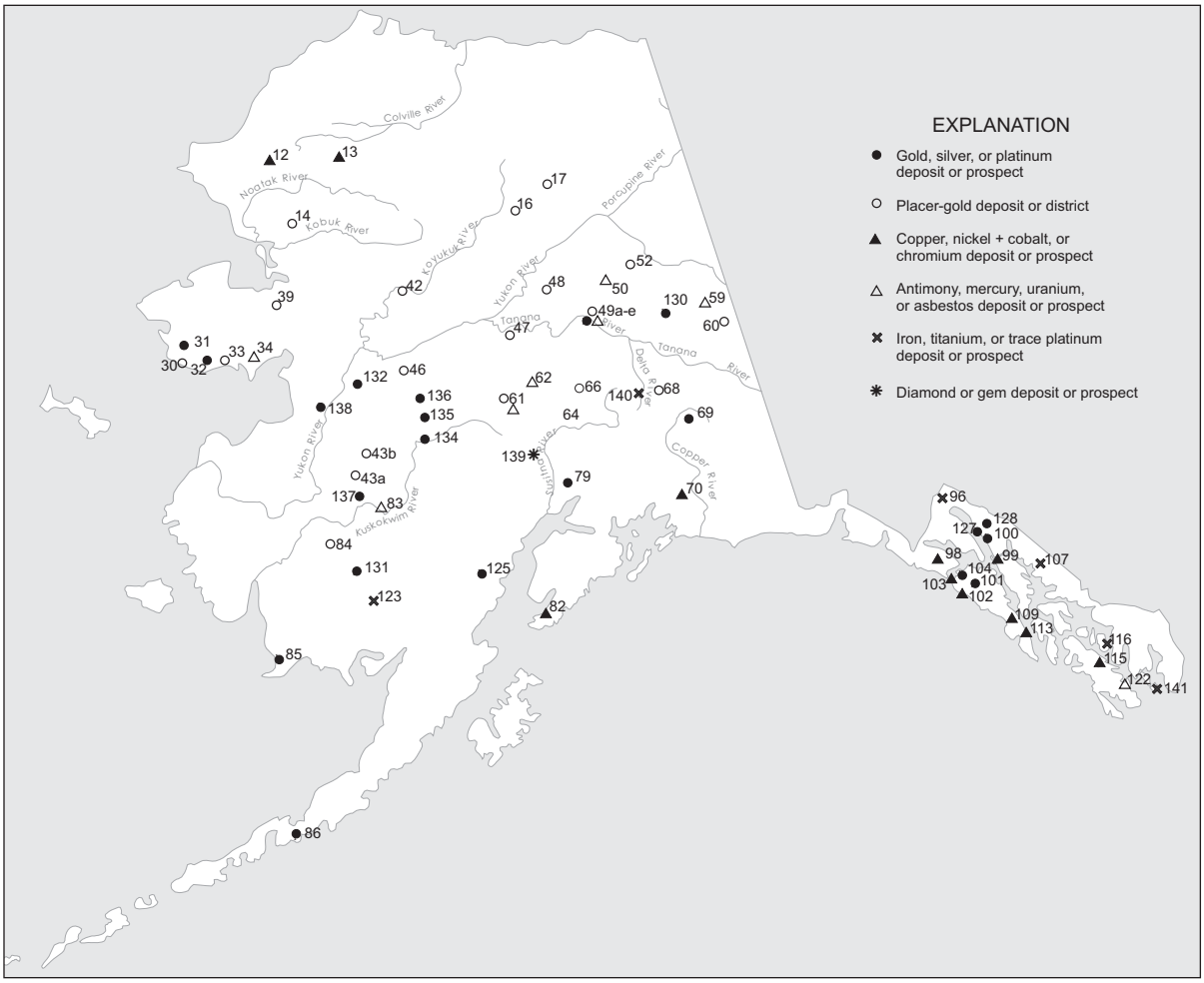


Figure C-3. Significant gold, silver, platinum, and strategic mineral deposits in Alaska, 2008.

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).

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

Companies and individuals reported to be producing metal in Alaska, 2008

OperatorCreek	District	Typea	
	NORTHERN REGION		
Barry Lambeth	Jennie Creek	Koyukuk	S/D - Recreation
Bill Fejes	Boulder Creek	Koyukuk	O/P Placer
Boreal Resources Inc.	California Creek, Jim Pup Creek	Koyukuk	O/P Placer
BREXCO	Lake 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
D.M.V.G. Ventures/ Bob Back	Prospect Creek	Koyukuk	O/P Placer
Donald Korte	Clara Creek	Koyukuk	S/D - Recreation
Eric Pyne	California Creek, Jim Pup Creek	Koyukuk	O/P Placer
Glen Deford	Smally Creek	Koyukuk	S/D - Recreation
James and Lorna Lounsbury	Union Gulch	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
Larry Weisz	Hammond River	Koyukuk	O/P Placer
Lloyd Swenson	Slate Creek	Koyukuk	O/P Placer
Mike Dobson	Prospect Creek	Koyukuk	O/P Placer
O. J. Jiles	Gold Bottom Creek	Koyukuk	O/P Placer
Paradise Valley Inc./ Mick Manns	Birch Creek, Flat Creek, Oregon Creek, Agnes Creek	Koyukuk	O/P Placer and S/D - Recreation
Richard Wright	Magnet Creek, Gold Creek	Koyukuk	O/P Placer
Rick Conklin	Boulder Creek	Koyukuk	O/P Placer
Slisco Inc./Ralph Hamm	Hammond River, Nugget Creek, Marion Creek, Swift Creek	Koyukuk	O/P Placer
Stewart Brandon	Myrtle Creek	Koyukuk	O/P Placer
Teck Cominco Alaska Inc.	Red Dog Mine	Noatak	O/P HR
William Nordeen	Emma Creek	Koyukuk	S/D - Recreation
	WESTERN REGION		
Alamin Mining Company	Cripple Creek, Bear Creek	Innoko	O/P Placer
Alaska Gold Company	Norton Sound	Nome	S/D - Large
Alfred Johnson	Cape Nome	Cape Nome	S/D - Large
Alfred Johnson	Norton Sound	Cape Nome	S/D - Large
Anderson & Sons Mining	not stated	Cape Nome	O/P Placer
Barry Clay	Willow Creek	Ruby	O/P Placer
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
Danny Bowland	Norton Sound	Cape Nome	S/D - Large
Daryl Galipeau	Norton Sound	Cape Nome	S/D - Recreation
David Powell	Norton Sound	Cape Nome	S/D - Large
Dean Race	Anvil Creek, Innoko River	Cape Nome	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	Near Mackum	Kougarok	O/P Placer
Frank McFarland	Norton Sound	Cape Nome	S/D - Large
Gerald Lindsey/ Nevak Mining Ltd.	Mud Creek	Fairhaven	O/P Placer
Innoko Resources Group	Innoko River	Innoko	O/P Placer
Jan Kralik	Gold Run Creek	Point Clarence	S/D - Large
Jan Kralik	Norton Sound	Cape Nome	S/D - Recreation
Jerry Landgrebe	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.

Operator	Creek	District	Type[a]
Jerry Pushcar	Benson Creek	Kougarok	O/P Placer
John Mehelich	Norton Sound	Cape Nome	S/D - Large
Jon Peckenpaugh	West Fork Sherrette Creek	Council	O/P Placer
K & S Leasing	Norton Sound	Cape Nome	S/D - Large
Ken Rucher/ Gold Prospectors Association of America	Nome Area	Cape Nome	S/D - Recreation
Lawrence Essad	Norton Sound	Cape Nome	S/D - Large
Little Creek Mine	Little Creek	Innoko	O/P Placer
Mark Gumaer	Dick Creek	Kougarok	O/P Placer
Mystery Creek Resources Ltd.	Nixon Fork Mine	McGrath	U/G HR
N. B. Tweet & Sons, LLC	Kougarok River	Kougarok	O/P Placer
Neil Rosander	Cripple Creek	Innoko	O/P Placer
Ralph Anderson	not stated	Cape Nome	O/P Placer
Randall Smith	Norton Sound	Cape Nome	S/D - Large
Rayson LLC/Gary Gustafson	Norton Sound	Cape Nome	S/D - Large
Richard Redmond	Macklin Creek	Kougarok	O/P Placer & S/D
Robin Gumaer	Doree Creek	Cape Nome	O/P Placer
Roger Nordlum	Glacier Creek	Fairhaven	O/P Placer
Rosander Mining Co.	Colorado Creek	Innoko	O/P Placer
Samuel "Kelly" Thomas	Sweepstakes Creek	Koyuk	O/P Placer
Sigvald Strandberg	Montana Creek, Creston Creek, Colorado Creek	Innoko	O/P Placer
Steve Phillips	Norton Sound	Cape Nome	S/D - Recreation
Steve Pomrenke	Martin Creek	Cape Nome	O/P Placer
Taiga Mining Company, Inc.	Clear Creek	Hughes	O/P Placer
Thomas Blake	Dome Creek	Nome	O/P Placer
Thomas Stamps	Norton Sound	Cape Nome	S/D - Recreation
Tom and Perry Massie	Arctic Creek	Cape Nome	S/D - Recreation S/D - Large
Triple D Mining	Candle Creek	Fairhaven	O/P Placer
Tundra Services	Dexter Creek	Cape Nome	O/P Placer
Victor Loyer	Candle Creek	Fairhaven	O/P Placer
Wesley Devore	Norton Sound	Cape Nome	S/D - Large
	EASTERN INTERIOR		
40 Mile River Gold Mining Co.	Fortymile River	Fortymile	S/D - Large
A. J. Davis	Cherry Creek	Fortymile	O/P Placer
Alan Las/Richardson Shield LLC	Smith Creek, Pool Creek	Fairbanks	O/P Placer
Alan Las/TonoGold Resources Inc.	No Grub Creek, The Lost Mine Creek	Fairbanks	O/P Placer
Alaska Placer Development, Inc.	Livengood Creek	Tolovana	S/D - Recreation
Albert Oldham	Wilber Creek	Fairbanks	O/P Placer
Aurora Mining	North Fork Harrison Creek	Circle	O/P Placer
Big G Mining	Deadwood Creek	Circle	O/P Placer
Bill Bayless	Franklin Creek	Fortymile	O/P Placer
Bill Miller	Jack Wade Creek	Fortymile	S/D - Recreation
Bill Rushing	Jack Wade Creek	Fortymile	S/D - Recreation
Billy Lance Sr.	Jack Wade Creek	Fortymile	O/P Placer
Bruce Herning/Herning Exploration & Mining	Palmer Creek	Fairbanks	S/D - Recreation
C.J. Hill	Lost Chicken Creek	Fortymile	O/P Placer
CCR Mining	Mammoth Creek, Stack Pup Creek	Circle	O/P Placer
Cascade Gold, LLC	Walker Fork	Fortymile	O/P Placer
Charles Hammond	45 Pup Creek, Chicken Creek	Fortymile	O/P Placer
Charles Zimmerman	Killarney Creek, Irish Gulch	Hot Springs	O/P Placer
Chris Groppel	Tenderfoot Creek	Fairbanks	O/P Placer
Chuck Felzien	American Creek	Eagle	S/D - Large

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S/D - Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Operator	Creek	District	Type[a]
Clayton Lapp/L & L Mining	Eagle Creek	Circle	O/P Placer
Cy Bras	Canyon Creek, Squaw Gulch	Fortymile	O/P Placer
D. Harvey Bickell	Walker Fork	Fortymile	O/P Placer
Daniel Jensen	McCumber Creek	Delta River	O/P Placer
David Eberhardt	Nugget Creek	Fairbanks	O/P Placer
David Hatch and Sonya Simon	Dome Creek	Fortymile	O/P Placer
David Howland	Dry Channel	Chistochina	O/P Placer
David Jacobs	Wilson Creek, Eva Creek	Fairbanks	O/P Placer
David Jacobs	Moose Creek	Bonnifield	O/P Placer
David Likins	Fortymile River	Fortymile	O/P Placer
David Newcomb	White Creek	Valdez Creek	O/P Placer
David Wegner	North Fork Fortymile River, Fortymile River	Fortymile	S/D - Large
Dawn Miller	Ottertail Creek	Fairbanks	S/D - Large and S/D - Recreation
Dean Willis	Crooked Creek	Circle	O/P Placer
DEPEM	Gilmore Creek, Tom Creek	Fairbanks	O/P Placer
Diversified Mining Ventures	Clifford Creek	Eagle	O/P Placer
Don Kiehl	Gold King Creek	Bonnifield	O/P Placer
Donald Smithwick	Crooked Creek	Eagle	O/P Placer
Donald Smithwick	Crooked Creek	Eagle	O/P Placer
Doug Baker	Cache Creek, Sullivan Creek, Idaho Creek	Hot Springs	O/P Placer
Earl Schene	Uhler Creek	Fortymile	O/P Placer
Earl Vegoren	Rainy Creek	Delta River	O/P Placer
Earth Movers of Fairbanks	Fairbanks Creek, Chatham Creek	Fairbanks	O/P Placer
Ed Salter	Alameda Creek	Hot Springs	O/P Placer
Elton McGhan	Kal Creek	Fortymile	O/P Placer
Ernest Johnson	Rhode Island Creek	Hot Springs	O/P Placer
Fairbanks Gold Mining Inc.	Fort Knox Mine	Fairbanks	O/P HR
Fairbanks Gold Mining Inc.	True North Mine	Fairbanks	O/P HR
Fred Cornelius	Fox Creek	Fairbanks	O/P Placer
Frontier Mining	Butte Creek	Circle	O/P Placer
Gary Freeland	Mosquito Fork	Fortymile River	O/P Placer
Gene Hume	Portage Creek	Circle	O/P Placer
George Seuffert, Jr.	Chicken Creek, Mosquito Fork	Fortymile	O/P Placer
George Seuffert, Jr.	Faith Creek	Fairbanks	O/P Placer
Gerald and Kathryn 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
Goldstream Mining LLC	Rhode Island Creek	Hot Springs	O/P Placer
Gordon Olson	Jack Wade Creek	Fortymile	O/P Placer
Guy Matthews	McArthur Creek	Fortymile	O/P Placer
Harold Mitchell	Mosquito Fork	Fortymile	O/P Placer
Jack Barnes dba Yella Metal Mining	Baby Creek, Squaw Gulch	Fortymile	O/P Placer/S/D?
Jackson Mining Company	Totatlanika River	Bonnifield	O/P Placer
James Decker	Sheep Creek	Bonnifield	O/P Placer
James Kimbro	Fortymile River	Fortymile	S/D - Large
James Treesh	Cherry Creek	Fortymile	O/P Placer
Jason Minekome, Kenneth Fox, Gerald Brike, Ken Foy	Walkers Fork	Fortymile	O/P Placer
Jean Turner	Fortymile River	Fortymile	O/P Placer
Jean Turner	Fox Creek	Fairbanks	O/P Placer
Jeff Owen	Davis Creek, Walkers Fork	Fortymile	O/P Placer
Jeffrey and Laura Thimsen	Upper Woods Creek	Fortymile	O/P Placer
Jerry Gallagher	Slate Creek	Rampart	S/D - Recreation
Jerry Hassel	Ready Bullion Creek	Fairbanks	O/P Placer
Jim Borland	Moose Creek	Bonnifield	O/P Placer
Jim Roland and Wallace Turner	Moose Creek	Bonnifield	O/P Placer

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S/D - Recreation = small suction dredge and recreational operations. Prepared from list of permitted operations; not all produced during the year.

Operator	Creek	District	Type[a]
John Lindholm	Amy Creek	Fairbanks	O/P Placer
John McClain	Kokomo Creek	Fairbanks	O/P Placer
John Schwartz	Our Creek	Fortymile	O/P Placer
John Shilling/ Thanksgiving Mining	Thanksgiving Creek	Rampart	S/D - Recreation
Judd Edgerton	Napoleon Creek	Fortymile	O/P Placer
Kathy Pennell	Little Boulder Creek	Hot Springs	O/P Placer
Keith Webster	Cherry Creek	Fortymile	O/P Placer
Kelly Mining	North Fork Creek	Hot Springs	O/P Placer
Ken Webeck	Rainy Creek	Delta River	O/P Placer
Kenneth and Teresa Hanson	Faith Creek	Fairbanks	O/P Placer
Kevin Bergman	Ester Creek	Fairbanks	O/P Placer
Kinross Gold Corp.	Fort Knox Mine	Fairbanks	O/P HR
KMM, Inc.	Hunter Creek	Rampart	O/P Placer
L & L Mining	Eagle Creek	Circle	O/P Placer
Larry Crouse	Fox Gulch	Fairbanks	O/P Placer
Laurence Ostnes	Totatlanika River	Bonnifield	O/P Placer
Leo Regner	Lilliwig Creek, Eagle Creek	Fortymile	O/P Placer
Linda Penfield	Slate Creek	Rampart	O/P Placer
Mammoth Mining	Porcupine Creek	Circle	O/P Placer
Mark and Roberta Brooks	Mosquito Fork, North Fork, South Fork Fortymile River	Fortymile	S/D - Recreation
Melvin Montgomery	Gilliland Creek, Jack Wade Creek	Fortymile	O/P Placer
Michael Mulligan	Skoogy Gulch	Fairbanks	O/P Placer
Michael Patrick	Fortymile River	Fortymile	S/D - Large
Michael Williams	McArthur Creek	Fortymile	O/P Placer
Mickey Jones and Gary Freeland	Mosquito Fork	Fortymile	O/P Placer
Mickey Jones	Mosquito Fork	Fortymile River	O/P Placer
Mike Allen	Slate Creek	Melozitna	O/P Placer
Miller Creek Mining Co.	Ketchum Creek	Circle	O/P Placer
Mudminers LLC	Sullivan Creek	Hot Springs	O/P Placer
Olson Placers	Ketchum Creek	Circle	O/P Placer
Olton Riddles	No Name	Fortymile	O/P Placer
Paul & Company	Porcupine Creek	Circle	O/P Placer
Peter Johnson	Fortymile River	Fortymile	S/D - Large
Peter Johnson	South Fork Fortymile River	Fortymile	S/D - Large
Polar Mining Inc.	Goldstream Creek	Fairbanks	O/P Placer
R & M Mining	Birch Creek	Circle	O/P Placer
Raleigh Cline	Eagle Creek	Fortymile	O/P Placer
Rampart Exploration LLC	American Creek	Hot Springs	O/P Placer
Ray Wolf	Greenhorn Creek, Traverse Creek, Bottom Dollar Creek	Circle	O/P Placer
Raymond Meder	Flume Creek	Fairbanks	O/P Placer
Red Olson Mining	Deadwood Creek	Circle	O/P Placer
Richard Farkas	Deadwood Creek	Circle	O/P Placer
Richard Loud	Harrison Creek, North Fork Harrison Creek, South 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	Smith Creek, Pool Creek	Fairbanks	O/P Placer
Rob Keller	Thistle Creek	Bonnifield	O/P Placer
Robert Clark	Gold Dust Creek	Circle	O/P Placer
Robert Emerson	No stream on property	Fairbanks	O/P Placer
Robert Hare	Gold Dust Creek	Circle	O/P Placer
Robert Kirsch	Kal Creek	Fortymile	O/P Placer
Ron Wrede	Switch Creek	Circle	O/P Placer
Ronald Tucker	Lillian Creek	Tolovana	O/P Placer

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Operator	Creek	District	Type[a]
RU Mining LLC	Olive Creek	Tolovana	O/P Placer
Rudd Van Dyke	Fortymile River	Fortymile	S/D - Large
Sam and Donna Skidmore	Vault Creek	Fairbanks	O/P Placer
Sam Koppenberg	Hunter Creek	Rampart	O/P Placer
Schmidt Mining	Walker Fork	Fortymile	O/P Placer
Scott Thomas	Deadwood Creek	Circle	O/P Placer
Seuffert Mining	Faith Creek	Fairbanks	O/P Placer
Sheldon Maier	Montana Creek	Fortymile	O/P Placer
Sherlund Mining, LLC	Ketchum Creek	Circle	O/P Placer
Silver Jim Stroer	Confederate Creek	Fortymile	S/D - Recreation
Stanley Gelvin	Crooked Creek	Circle	O/P Placer
Stephen Olson	Liberty Creek	Fortymile	O/P Placer
Steve Gavora	Fairbanks Creek	Fairbanks	O/P Placer
Steve Holmes	Gold King Creek	Bonnifield	O/P Placer
Steven Olson	Eagle Creek	Circle	O/P Placer
Teck Pogo, Inc.	Pogo Mine	Goodpaster	U/G HR
Terry Russell	Ready Money Creek	Hot Springs	O/P Placer
Terry Russell	Trail Creek (Wilder Gulch)	Hot Springs	O/P Placer
Theodore Payment	Fortymile River	Fortymile	O/P Placer
Tim Beaton/ Beaton Path Mining LLC	Nugget Creek, Wilson Creek	Gold Hill - Melozitna	O/P Placer
Timothy Ruppert	Little Moose Creek	Bonnifield	S/D - Recreation
Vernon Thurneau	Fortymile River	Fortymile	O/P Placer
Walter Bohan, William Bohan	Ottertail Creek	Fairbanks	S/D - Large and S/D - Recreation
Walter Stockwell	Tenderfoot Creek	Delta River	O/P Placer
Wanda Severson	Willow Creek	Fortymile	S/D - Recreation
William Aldridge	Poker Creek	Fortymile	O/P Placer
William Bohan	Ottertail Creek	Fairbanks	S/D - Large S/D - Recreation
	SOUTHCENTRAL REGION		
Brian Berkhahn	Mills Creek	Yentna	S/D - Large
Carl Wilbur	Yacko Creek	Nelchina	O/P Placer
Daniel Hartman	Cache Creek	Yentna	S/D - Recreation
Dennis Boyce	Busch Creek	Valdez Creek	O/P Placer
Dennis Garrett	Willow Creek, Lucky Creek, Gopher Creek, Ruby Creek	Yentna	S/D - Large
Diamond Gold Corporation	Kahiltna River	Yentna	O/P Placer
Donald Stein / DEPEM	Tom Creek, Gilmore Creek	Fairbanks	O/P Placer
Eric Berg and Robert Baker	Canyon Creek	Hope- Sunrise & Seward	S/D - Recreation
Fred Wilkes	Bird Creek	Yentna	O/P Placer
Gerald Anderson	Yacko Creek	Nelchina	O/P Placer
Girdwood Mining Co.	Crow Creek	Anchorage	O/P Placer
Gorden Bartel	Mills Creek	Yentna	O/P Placer
Gordon Richmond	Buchia Creek	Valdez Creek	O/P Placer
Harold Olson	Willow Creek	Yentna	O/P Placer
Herman Mrak	Willow Creek, Grubstake Creek	Willow Creek	O/P Placer
James Werner	Canyon Creek	Hope- Sunrise & Seward	S/D - Recreation
John Chamberlain	Roosevelt Creek	Valdez Creek	O/P Placer
John Deacon	Canyon Creek	Hope- Sunrise & Seward	S/D - Recreation
John Werner	Cache Creek	Hope- Sunrise & Seward	S/D - Recreation
Kate Toohey	Crow Creek	Anchorage	S/D - Recreation
Kenneth and Winona Lee	Cache Creek	Yentna	O/P Placer S/D - Recreation
Mark Richard	Caribou Creek	Willow Creek	O/P Placer
Mike and Michelle Spain	Homestake Creek, Grubstake Creek	Willow Creek	S/D - Recreation

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Operator	Creek	District	Type[a]
New Recovery Systems, Inc.	Alfred Creek	Willow Creek	O/P Placer
Richard Peterson	Willow Creek	Nelchina	O/P Placer
Robert Haines	Mills Creek	Yentna	O/P Placer
Sean Toohey	Crow Creek	Anchorage	S/D - Recreation
Steve Sneed/dba North American Mining LLC	Cottonwood Creek, Willow Creek, Little Willow Creek	Yentna	O/P Placer
Steven Priddle	Roosevelt Creek	Valdez Creek	O/P Placer
Tod Bauer	Gold Creek, Eldorado Creek	Valdez Creek	O/P Placer
Tom Bates	Long Creek	Yentna	S/D - Recreation
Tom Sternberg	Quartz Creek	Hope- Sunrise & Seward	S/D - Recreation
Walt Willie	Rusty Creek	Valdez Creek	O/P Placer
William Stock	White Creek	Valdez Creek	O/P Placer
	SOUTHWESTERN REGION		
Ben Porterfield	Fish Creek	McGrath-McKinley	O/P HR
Clark-Wiltz Mining	Ganes Creek and tributaries	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
Larry Wilmarth	George River	Aniak	S/D - Recreation
Lyman Resources Alaska Inc.	Crooked Creek, Donlin Creek	Iditarod	O/P Placer
Mark Matter	Marvel Creek	Aniak	O/P Placer
Max Agoff	Prince Creek	Iditarod	O/P Placer
Moore Creek Mining	Moore Creek	Innoko	O/P Placer
NYAC Mining Co.	Old dredge tailings, Sahula Creek, Shamrock Creek, California Creek, Rock Creek	Aniak Aniak	O/P Placer O/P Placer
Richard and LeRoy Busk	Syneeva 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
Hecla Greens Creek Mining Company	Greens Creek Mine	Admiralty	U/G HR
Jerry Fabrizio/Snow Lion II Ltd. Partnership	Porcupine Creek	Juneau	O/P Placer
Robert and Kathleen Christianson	Cape Yakataga beach	Yakataga	O/P Placer

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APPENDIX E
Websites for commercial recreational mining ventures and mining-related attractions in Alaska

Name of Operation	Mining District	Website
Commercial Recreational Mining Operations		
Cache Creek Cabins	Yentna–Cache Creek	http://www.cachecreekcabins.com
Chicken Gold Camp and Outpost	Fortymile	http://www.chickengold.com
Clark–Wiltz Mining	Innoko–Tolstoi–Ophir	http://www.clark-wiltz.com
Crow Creek Gold Mine	Anchorage	http://www.crowcreekmine.com
Faith Creek Camp	Fairbanks	http://www.angelfire.com/ak5/faithcreekgold/index.html
Gold Prospectors Association of America	Cape Nome	http://www.goldprospectors.org
Moore Creek Mining	Innoko–Tolstoi–Ophir	http://www.moorecreek.com/pay_to_mine.htm
Paradise Valley	Koyukuk–Nolan	http://www.akpub.com/akttt/parad.html
Mining-Related Tourist Attractions		
Circle District Historical Museum	Central	http://www.museumsusa.org/museums/info/1160124
El Dorado Gold Mine	Fairbanks	http://www.eldoradogoldmine.com/
Fairbanks Community Museum	Fairbanks	http://fairbanks-alaska.com/fairbanks-museum.htm
George Ashby Museum	Copper Center	http://www.museumsusa.org/museums/info/1160126
Gold Dredge No. 8	Fairbanks	http://www.golddredgeno8.com
Hope	Hope	http://www.advenalaska.com/hope/default.htm
Independence Mine State Park	Willow Creek/ Hatcher Pass	http://www.alaskaone.com/independence-mine-state-park
Juneau Douglas City Museum	Juneau	http://www.juneau.org/parkrec/museum/exhibits/index.htm
Kennecott Copper Mine	Kennecott	http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=1800&ResourceType=District
Last Chance Mining Museum	Juneau	http://www.museumsusa.org/museums/info/1160155
Pioneer Museum	Fairbanks	http://www.akpub.com/akttt/pione.html
Pump House Restaurant	Fairbanks	http://www.pumphouse.com
Skagway National Historic District	Skagway	http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=714&ResourceType=District
University of Alaska Museum of the North	Fairbanks	http://www.uaf.edu/museum
Valdez Museum	Valdez	http://www.valdezmuseum.org
White Pass & Yukon Railway	Skagway	http://www.wpyr.com

The lists of companies and attractions shown above are not intended to be comprehensive.

APPENDIX F

State and federal agencies and private interest groups involved in mineral development activities, 2008

(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 $20 plus shipping and handling.)

STATE OF ALASKA

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: patricia.eckert@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
(907) 465-2500
(907) 465-5442 (fax)
http://www.commerce.state.ak.us

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
P.O. 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

Division of Habitat
Headquarters
P.O. Box 115526
Juneau, AK 99811-5526
(907) 465-1852
(907) 465-2066 (fax)
http://www.habitat.adfg.alaska.gov

Function: The Division of Habitat fulfills specific statutory responsibilities for (1) protecting freshwater and anadromous fish habitat under the Anadromous Fish Act (AS 16.05.811) and (2) providing free passage of anadromous and resident fish in fresh waterbodies (AS 16.05.841). 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. The Division also authorizes activities in legislatively designated Special Areas (AS 16,.20.010- .630; 5 AAC95).

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

Anchorage Area Office
333 Raspberry Rd.
Anchorage, AK 99518-1565
(907) 267-2342
(907) 267-2499 (fax)

Juneau Office
P.O. Box 110024
Juneau, AK 99811-0024
(907) 465-4105
(907) 465-4759 (fax)

Kenai Area Office
514 Funny River Rd.
Soldotna, AK 99669-8255
(907) 260-4882 ext. 222
(907) 260-5992 (fax)

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

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

DEPARTMENT OF NATURAL RESOURCES
Office of the Commissioner
550 W. 7th Ave., Ste. 1400
Anchorage, AK 99501
(907) 269-8431
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 reviews of mining projects within the coastal zone, while coordinating with Federal mining permitting agencies. Assists applicants in shaping mining projects to be consistent with the ACMP. Coordinates State response to Federal development activities and permitting 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.

Division of Forestry
550 W. 7th Ave., Ste. 1450
Anchorage, AK 99501-3566
(907) 269-8463
http://forestry.alaska.gov

Function: Establishes guidelines to manage mining in state forests.

Northern Region Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2670

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: dggspubs@alaska.gov
http://www.dggs.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)
kenneth.papp@alaska.gov

Division of Mining, Land & Water
550 W. 7th Ave., Ste. 1070
Anchorage, AK 99501

A. Mining

Function: Principal agency for management of mining on state land in Alaska and reclamation of mined lands throughout 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) on state-owned lands. 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.

Regional 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)
email: 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: oha@alaska.net
http://dnr.alaska.gov/parks/oha/index.htm

DEPARTMENT OF PUBLIC SAFETY
Public Safety Headquarters
Office of the Commissioner
5700 East Tudor Rd.
Anchorage, AK 99507-1225
(907) 269-5086
(907) 269-4543 (fax)
http://www.dps.state.ak.us

Alaska Wildlife Troopers
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.

Department 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
162 College Rd.
University of Alaska
Soldotna, AK 99669
(907) 262-2788
(907) 262-2812 (fax)
email: mapts@alaska.net
www.mapts.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) 271-5049
Solid Minerals Branch (907) 271-5049

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
Geology Office
4200 University Dr.
Anchorage, AK 99508-4667
(907) 561-1181

Function: 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
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

Physical Address:
222 W. 8th Ave A-35
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.
Attn: John Kato
Assistant Director for Minerals and Geology Programs
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/

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
101 Dunkel St., Ste 110
Fairbanks, AK 99701
(907) 459-3730
(907) 459-3729 (fax)
www.alaskacenters.gov

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, Community and Economic Development, and Transportation and Public Facilities.

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.com

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

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: nwma_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

Fortymile Mining District
Sheldon Maier, President
General Delivery
Chicken, AK 99732

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)
4141 B Street, Suite 402
Anchorage, AK 99503
(907) 276-5487
(907) 276-5488 (fax)
email: kits@ameref.org
http://www.ameref.org

Function: A 501c(3) educational non-profit whose mission is to provide

Alaska's students with the knowledge to make informed 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
4600 DeBarr Rd., Ste 200
Anchorage, AK 99508-3126
(907) 344-7212
(907) 563-2742 (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) 272-5060 (fax)
http://www.calistacorp.com/

CHUGACH ALASKA CORP.
3800 Centerpoint Dr.
Anchorage, AK 99503-4196
(907) 563-8866
(907) 261-0373 (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.
Charlie Powers, V.P. Corporate Affairs
104 Center Ave., Ste. 205
Kodiak, AK 99615
(907) 486-2530
(907) 486-3325 (fax)
cpowers@koniag.com
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 9980
(907) 586-1512
(907) 463-3897 (fax)
http://www.sealaska.com/

APPENDIX G
Alaska mining websites

Mining and Exploration Companies

Alaska Earth Sciences Inc.	http://www.aes.alaska.com
Alix Resources Corp.	http://www.alixresources.com/
Altair Ventures Inc.	http://www.altairventuresinc.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/
Anglo American Exploration (USA) Inc.	http://www.angloamerican.ca/
Arctic Oil & Gas Corp.	http://www.arcticoag.com/
Australian Mineral Fields Ltd.	http://www.australianmf.com/
Avalon Development Corp.	http://www.avalonalaska.com
Barrick Gold Corp.	http://www.barrick.com/
BHP Billiton Ltd.	http://www.bhpbilliton.com/
Black Range Minerals Ltd.	http://www.blackrangeminerals.com/
Bravo Venture Group Inc.	http://www.bravoventuregroup.com/
Brett Resources Inc.	http://www.brettresources.com/s/Home.asp
Browns Hill Quarry	http://bricecompanies.com/quarry/quarry.html
CBR Gold Corp. (Committee Bay Resources Ltd.)	http://www.cbrgoldcorp.com/
Century Mining Corp.	http://www.centurymining.com
Chuitna Coal Project	http://www.chuitnaseis.com/default.htm
Clark–Wiltz Mining	http://www.clark-wiltz.com/
Coeur d'Alene Mines Corp. (Coeur Alaska Inc.)	http://www.coeur.com
Constantine Metal Resources Ltd.	http://www.constantinemetals.com/
Copper Ridge Explorations Inc.	http://www.copper-ridge.com
Freegold Ventures Ltd.	http://www.freegoldventures.com
Full Metal Minerals Ltd.	http://www.fullmetalminerals.com
Geocom Resources Inc.	http://www.geocom-resources.com
Geohedral LLC	http://www.beardco.com/ITS/geohedral.htm
Geoinformatics Exploration Inc.	http://www.geoinformex.com
Gold Crest Mines Inc.	http://www.goldcrestminesinc.com/
Goldrich Mining Co. (Little Squaw Gold Mining Co.)	http://www.goldrichmining.com/
Grayd Resource Corp.	http://www.grayd.com
Great Basin Gold Ltd.	http://www.greatbasingold.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 Minerals Co.	site no longer active
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.libertystaruranium.com
Linux Gold Corp.	http://www.linuxgoldcorp.com
Mantra Mining Inc.	http://www.mantramining.com/
Max Resource Corp.	http://www.maxresource.com/s/Home.asp
Metallica Resources Inc.	http://www.metal-res.com/
Midas Resources Ltd.	http://www.midasresources.com.au/
Millrock Resources Inc.	http://www.millrockresources.com/
Moore Creek Mining LLC	http://www.moorecreek.com/index.html
New Gold Inc.	http://www.newgold.com/
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

Paradise Valley Inc.	http://www.akpub.com/akttt/parad.html
Pebble Limited Partnership	http://www.pebblepartnership.com/
Pure Nickel Inc.	http://www.purenickel.com/s/Home.asp
Quaterra Resources Inc.	http://www.quaterraresources.com/
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
Senator Minerals Inc.	http://www.senatorinc.com/
Silverado Gold Mines Ltd.	http://www.silverado.com
Sisyphus Consulting	http://www.sisyphus-consulting.com
St. Andrew Goldfields Ltd.	http://www.sasgoldmines.com/s/Home.asp
Stillwater Mining Co.	http://www.stillwatermining.com/
Sumitomo Metal Mining Co. Ltd	http://www.sumitomocorp.co.jp/English
Teck Cominco Ltd.	http://www.teck.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
Ucore Uranium Inc.	http://www.ucoreuranium.com/
Usibelli Coal Mine Inc.	http://www.usibelli.com
YOW Capital Corp.	http://www.yowcapital.com/index.cfm
Zazu Metals Corp.	http://www.zazumetals.com/main/

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 Office of Economic 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
DNR Sites Related to Mining Applications and Forms	http://www.dnr.state.ak.us/mlw/forms
DOR Mining License Tax Forms	http://www.tax.alaska.gov/programs/programs/forms/index.aspx?60610
Guide to Alaska Geologic and Mineral Information	http://www.dggs.dnr.state.ak.us/webpubs/dggs/ic/text/ic044ed2004.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 H
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 I
Primary metals production in Alaska, 1880-2008[a,b]

Year	Gold[c]		Silver		Mercury		Antimony		Tin		Lead		Zinc		Platinum[e]		Copper		Chromium	
	(oz)	(m$)	(oz)	(t$)	(flask[d])	(t$)	(lb)	(t$)	(lb)	(t$)	(tons)	(t$)	(tons)	(t$)	(oz)	(t$)	(lb)	(m$)	(tons)	(t$)
1880–1899	1,153,889	23.85	496,101	329.0	--	--	--	--	--	--	250	17.0	--	--	--	--	--	--	--	--
1900–1909	6,673,173	137.94	1,324,580	779.5	--	--	--	--	304,000	112.2	369	32.8	--	--	--	--	29,549,486	4.81	--	--
1910–1919	7,209,094	149.01	7,058,235	5,107.5	--	--	2,760,000	W	1,640,000	805.9	3,565	470.2	--	--	914	116.5	515,253,817	109.90	2,200	W
1920–1929	3,373,336	69.77	6,407,375	5,160.8	117	7.6	W	W	317,800	163.9	7,961	1,084.1	--	--	5,750	484.9	643,576,929	93.33	--	--
1930–1939	5,345,205	150.84	3,250,173	1,889.8	31	2.3	1,616,000	228.3	1,024,400	502.1	10,791	914.3	--	--	102,615	5,427.1	184,522,000	19.48	--	--
1940–1949	3,137,447	109.79	794,842	577.0	3,094	724.3	2,062,080	311.1	319,200	230.3	3,096	405.2	678	0.5	225,285	12,623.3	433,700	0.24	7,409	250.9
1950–1959	2,297,827	80.63	321,669	292.9	18,185	4,370.0	2,663,520	3,697.6	1,144,000	1,310.5	177	38.6	--	--	107,927	9,403.9	106,000	0.14	21,442	1,975.8
1960–1969	751,870	26.56	59,300	70.7	13,996	3,098.0	228,800	267.8	--	--	40	9.9	--	--	111,556	13,618.5	352,000	0.14	--	--
1970–1979	324,906	55.77	54,700	250.5	4,040	1,694.0	1,473,000	1,714.0	166,000	949.0	20	8.0	--	--	41,604	6,826.0	--	--	8,000	1,200.0
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	--	--	--	--	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	2.98	--	--
2000	551,982	154.06	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	--	--	--	--	--	--	146,462	61,514.0	718,103	502,674.0	--	--	3,200,000	2.27	--	--
2003	528,191	191.93	18,589,100	95,300.0	--	--	--	--	--	--	162,479	64,279.0	714,769	536,348.0	--	--	--	--	--	--
2004	456,508	192.34	16,947,270	113,056.9	--	--	--	--	--	--	150,796	120,636.8	680,015	651,432.2	--	--	--	--	--	--
2005	427,031	189.92	11,670,000	85,382.0	--	--	--	--	--	--	131,366	115,230.0	684,462	862,108.0	--	--	--	--	--	--
2006	570,129	344.05	16,489,394	190,415.9	--	--	--	--	--	--	157,128	183,629.3	673,967	2,002,971.4	--	--	--	--	--	--
2007	726,933	511.09	20,203,985	270,402.1	--	--	--	--	--	--	167,181	389,532.2	696,115	2,048,451.6	--	--	87,627	0.28	--	--
2008	800,752	698.22	14,643,735	219,496.4	--	--	--	--	--	--	153,705	287,428.4	626,135	1,055,220.1	--	--	--	--	--	--
Other[f]	--	--	--	--	1,438	--	--	--	--	--	--	--	--	--	71,946	17,091.9	--	--	--	--
Total	**40,416,575**	**5,194**	**263,236,020**	**1,687,486**	**40,945**	**9,911**	**11,070,800**	**6,655**	**7,287,700**	**12,524**	**2,057,593**	**1,719,265**	**9,788,599**	**12,583,740**	**668,548**	**48,724**	**1,394,901,559**	**245**	**39,051**	**3,427**

[a]From published and unpublished state and federal documents. Where state and federal figures differ significantly, state figures are used.
[b]Please refer to previous editions of this appendix for year-to-year production information for years 1900 to 1979.
[c]Gold production adjusted to be consistent with mining district production totals.
[d]76-lb flask.
[e]Crude platinum; total production of refined metal is about 575,000 oz.
[f]Not traceable by year.
W = withheld.
-- = Not reported.
t$ = Thousand dollars.
m$ = Million dollars.

APPENDIX J

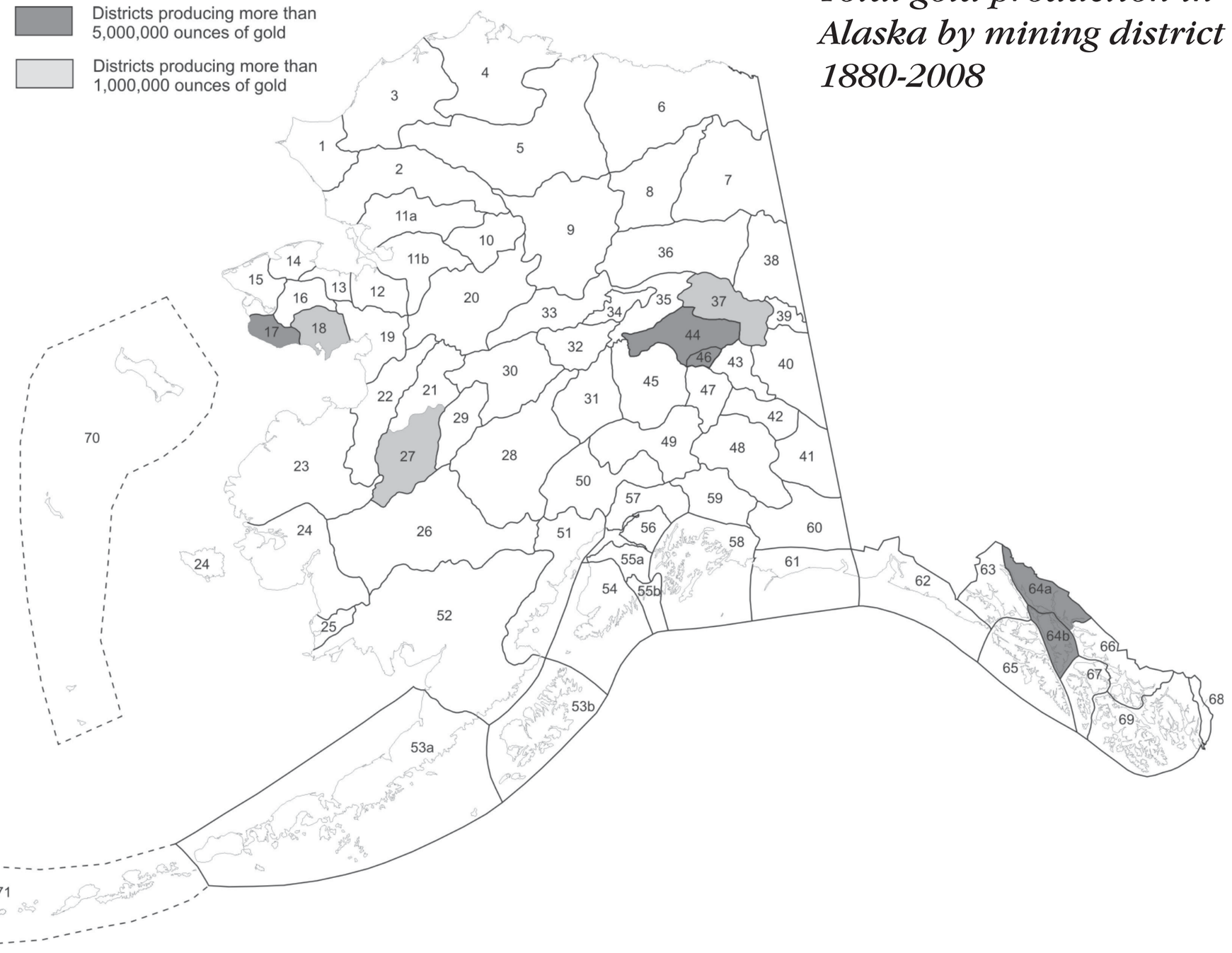
Production of industrial minerals, coal, and other commodities in Alaska, 1880-2008[a,b]

Year	Coal		Sand and gravel		Rock[c]		Barite		Other[d]
	s. tons	m$	s. tons	m$	s. tons	m$	s. tons	t$	$
1880–1899	19,429	0.14	- -	- -	7,510	0.04	- -	- -	- -
1900–1909	33,214	0.20	- -	- -	15,318	0.18	- -	- -	246,403
1910–1919	210,806	1.16	- -	- -	50,014	0.29	- -	- -	2,014,788
1920–1929	937,860	5.20	- -	- -	494,417	2.73	0	-	2,523,754
1930–1939	1,222,797	5.49	42,332	0.02	689,676	2.75	0	-	899,767
1940–1949	3,189,026	20.22	1,758,504	0.69	286,341	1.33	0	-	27,124,158
1950–1959	6,632,641	59.70	65,804,686	55.14	1,843,560	5.17	0	-	25,443,427
1960–1969	7,849,000	58.84	163,315,000	176.72	2,034,000	4.20	225,000	1,200.0	34,143,000
1970–1979	7,405,000	88.97	489,522,000	1,004.88	47,930,000	137.35	502,000	8,217.0	77,501,000
1980	800,000	16.00	40,000,000	86.00	3,700,000	15.40	50,000	2,000.0	97,500
1981	800,000	17.60	46,000,000	88.20	4,200,000	19.30	- -	- -	256,000
1982	830,000	18.00	45,000,000	91.00	3,400,000	15.60	- -	- -	150,000
1983	830,000	18.00	50,000,000	105.00	5,270,000	25.00	- -	- -	242,000
1984	849,161	23.75	27,000,000	95.00	2,700,000	16.00	- -	- -	875,875
1985	1,370,000	39.73	28,184,080	112.06	2,500,000	12.00	- -	- -	559,000
1986	1,492,707	40.10	20,873,110	75.76	4,200,000	20.32	- -	- -	384,800
1987	1,508,927	42.35	16,696,374	42.66	1,805,000	11.62	- -	- -	388,400
1988	1,551,162	44.30	17,264,500	48.75	3,600,000	24.65	- -	- -	389,000
1989	1,452,353	41.46	14,418,000	39.88	2,914,000	20.34	- -	- -	1,492,000
1990	1,576,000	44.99	15,013,500	40.82	3,200,000	22.10	- -	- -	400,000
1991	1,540,000	39.00	14,160,011	45.45	3,000,000	22.50	- -	- -	462,000
1992	1,531,800	38.30	14,599,746	42.20	2,900,000	22.97	- -	- -	430,000
1993	1,586,545	38.10	13,162,402	40.64	3,561,324	26.21	- -	- -	465,000
1994	1,490,000	36.75	13,518,321	40.95	3,843,953	27.04	- -	- -	459,500
1995	1,640,000	41.30	9,847,550	30.89	2,811,152	22.13	- -	- -	182,500
1996	1,481,000	38.00	9,890,463	32.20	3,000,045	23.56	- -	- -	200,000
1997	1,446,000	38.05	13,800,000	51.91	3,200,000	20.00	- -	- -	217,000
1998	1,339,000	35.23	12,363,450	57.28	1,636,200	14.04	- -	- -	215,000
1999	1,560,000	41.05	10,600,000	52.42	1,640,000	18.01	- -	- -	- -
2000	1,473,355	38.77	10,600,000	49.86	5,200,000	36.59	- -	- -	- -
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	120.70	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	23.85	- -	- -	1,057,500
2007	1,357,000	44.56	14,163,676	76.12	2,211,954	25.51			7,500
2008	1,538,000	53.83	12,461,685	72.44	2,485,820	39.55			
Other	- -	- -	- -	- -	2,300,000e	W	79,000	W	- -
TOTAL	**66,575,457**	**1,341.47**	**1,284,848,956**	**3,136.40**	**148,219,626**	**876.11**	**856,000**	**11,417.0**	**182,544,068**

[a]From published and unpublished state and federal documents. Where state and federal figures differ significantly, state figures are used.
[b]Please refer to previous editions of this appendix for year-to-year production information for years 1900 to 1979.
[c]Building-stone production figures for 1880-1937 are for the southcentral and interior regions of Alaska only.
[d]Includes 2.4 million lb U_3O_8 (1955–71); 505,000 tons gypsum (1905-26); 286,000 lb WO_3 (intermittently 1916-80); 94,000 lb asbestos (1942–44); 540,000 lb graphite (1917–18 and 1942–50); and undistributed amounts of zinc, jade, peat, clay, soapstone, miscellaneous gemstones, and other commodities (1880–1993).
[e]Marble quarried on Prince of Wales Island, southeastern Alaska (1900–41).
m$ = Million dollars.
t$ = Thousand dollars.
- - = Not reported.
W = withheld.

Total gold production in Alaska by mining district 1880-2008

	Mining districts[a]	Production (in refined troy ounces) Total production	Placer	Lode
1	Lisburne district	0	0	0
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	66,338	48,938	17,400
9	Koyukuk district	360,572	360,572	0
10	Shungnak district	15,000	15,000	0
11	Kiana & Selawik districts	40,600	40,600	0
12	Fairhaven district (Candle subdistrict)	349,081	349,081	0
13	Fairhaven district (Inmachuk subdistrict)	253,720	253,720	0
14	Serpentine district	4,220	4,220	0
15	Port Clarence district	42,358	42,358	0
16	Kougarok district	183,446	183,446	0
17	Nome (Cape Nome) district	5,007,876	5,007,876	0
18	Council district	1,046,717	1,019,717	27,000
19	Koyuk district	84,325	84,325	0
20	Hughes district	302,204	302,204	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	31,200	31,200	0
26	Aniak district	602,199	602,199	0
27	Iditarod district	1,563,871	1,560,941	2,930
28	McGrath district	337,005	133,306	203,699
29	Innoko district	739,206	739,050	156
30	Ruby district	477,976	477,976	0
31	Kantishna district	99,307	91,401	7,906
32	Hot Springs district	589,234	589,234	0
33	Melozitna district	12,859	12,859	0
34	Rampart district	199,916	199,916	0
35	Tolovana district	530,196	530,196	0
36	Yukon Flats district	0	0	0
37	Circle district	1,092,871	1,092,871	0
38	Black district	2	2	0
39	Eagle district	52,120	52,120	0
40	Fortymile district	568,849	568,849	0
41	Chisana district	144,500	78,000	66,500
42	Tok district	280	280	0
43	Goodpaster district	722,753	2,050	720,703
44	Fairbanks district	12,855,706	8,206,909	4,648,797
45	Bonnifield district	90,549	83,849	6,700
46	Richardson subdistrict of Fairbanks district[c]	120,940	118,640	2,300
47	Delta River district	10,520	10,520	0
48	Chistochina district	183,356	183,356	0
49	Valdez Creek district	514,383	512,802	1,581
50	Yentna district	200,421	200,421	0
51	Redoubt district	105	105	0
52	Bristol Bay Region	1,570	1,570	0
53	Kodiak district (53b)-Alaska Peninsula Region (53a)	112,407	4,807	107,600
54	Homer district	16	16	0
55	Hope & Seward districts	135,120	70,120	65,000
56	Anchorage district[d]	240	240	0
57	Willow Creek district	667,001	58,001	609,000
58	Prince William Sound district	137,790	90	137,700
59	Nelchina district	14,603	14,603	0
60	Nizina district	148,500	148,500	0
61	Yakataga district	18,041	18,041	0
62	Yakutat district[e]	13,200	2,200	11,000
63	Juneau district (partial)	82,191	82,191	0
64	Juneau (64a) & Admiralty (64b) districts	8,906,571	81,041	8,825,530
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	**40,906,240 (1,272.3 tonnes)**	**24,472,435**	**16,433,805**



[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.

Top Left. *Drillers exploring on the Pebble property. Photo provided by the Pebble Limited Partnership.*

Top Right. *Mining gold ore at the Rock Creek Mine. NovaGold Resources stockpiled ore for much of 2008 in anticipation of opening mill operations at Rock Creek. The mine went into care and maintenance status after several brief periods of operation. Photo provided by NovaGold Resources Inc.*

Above. *Larry Freeman and Jen Athey of the Alaska Division of Geological & Geophysical Surveys (DGGS) prepare to examine metavolcanic rocks at the Red Mountain volcanogenic massive sulfide prospect. DGGS mapped the eastern part of the Bonnifield mining district during 2008. Red Mountain is in the background. Photo by Melanie Werdon.*

Left. *Core drilling by Dave Cooper of CNC Drilling Inc. on the Golden Summit project. Photo provided by Avalon Development Corp.*

Bottom Left. *Nick Van Treeck and Rebecca Klein work on sample preparation at the rotary air blast drill rig, Tolovana prospect, Golden Summit project. Photo courtesy of Avalon Development Corp.*

Below. *Drilling in challenging terrain at the South Wall discovery drill site on the Palmer volcanogenic massive sulfide property near Haines, Alaska. Photo courtesy of Constantine Metal Resources Inc.*