

THE MINERAL INDUSTRY OF ALASKA

In 1996, Alaska had an estimated \$523 million in total nonfuel mineral production value,¹ according to the U.S. Geological Survey (USGS). However, the dollar value totals for 1995-96, as given in table 1, are artificially low because data have been withheld to avoid disclosing company proprietary data. With these data included, the State would have ranked 22d among the 50 States in 1996 and 20th in 1995. In addition, Alaska's nonfuel mineral production value showed an increase rather than a decrease (as shown in table 1) from 1995 to 1996. The State accounted for approximately 1.5% of the U.S. total nonfuel mineral production value.

Overall, metallic minerals accounted for more than 85% of the State's total nonfuel mineral production value, and the large majority of this was from zinc, lead, and silver production at the Red Dog Mine in northwestern Alaska. Compared with data for 1995, the production values of all the State's nonfuel minerals increased in 1996 except for that of zinc.

Based on USGS estimates of the quantities produced in the 50 States during 1995, Alaska remained first in zinc, second in lead, fifth in silver, and seventh² of the 13 gold-producing States. Additionally, significant quantities of construction sand and gravel were produced from the State's mine pits. Production of peat was not reported to the USGS, in part because of reporting difficulties associated with the seasonal, intermittent nature of the mineral commodity's mining in the State. The Alaska Department of Natural Resources' Division of Geological and Geophysical Surveys (DGGs) estimated peat production to be about 29,000 cubic meters (38,000 cubic yards) for a value of \$175,000.

The following narrative information was provided by the DGGs.³ Based on DGGs estimates, increases occurred in all three mine-related activity categories: exploration increased 30% over the 1995 value to \$44.5 million, development was up 165% to \$394 million, and production increased 10% to \$591 million (includes coal and peat production). For the first time, the cumulative value of the Alaska mineral industry, as measured by the sum of exploration and development expenditures and the value of production, exceeded \$1 billion.

Promising Alaska exploration and development projects include the Kensington gold mine near Juneau, the True North gold property near Fairbanks, the Donlin Creek gold prospect near Flat, the Pogo gold prospect near Delta Junction, and the Calder Island limestone and the Niblack polymetallic projects on Prince of Wales Island.

The Alaskan minerals industry provided an estimated 3,750 full-time equivalent jobs in 1996, an increase of

about 340 or 10% from the 3,400 Alaskan mine-related jobs in 1995. Most of the job increases were attributed to: (1) new hardrock mine employment at the Greens Creek polymetallic mine near Juneau and the Nixon Fork gold-copper mine near McGrath; (2) mineral development projects at the Red Dog zinc-lead-silver mine near Kotzebue, the Illinois Creek gold project near Galena, and the Fort Knox gold project near Fairbanks; and (3) new exploration jobs statewide. Contrasting the increases in hardrock mineral-related job opportunities was a decrease in employment at placer gold mines.

According to DGGs, the value of 1996 Alaska mineral production increased by an estimated \$53.8 million or nearly 10% above the 1995 value. Overall value for metallic products climbed from \$443 million in 1995 to \$495 million in 1996, a 12% increase. DGGs reported that about 350 metric tons⁴ of copper valued at more than \$800,000 was produced as a byproduct in two new hardrock mines—the first copper credited from Alaskan mines in nearly four decades. The value of Alaska's industrial minerals production increased in 1996. In addition to crushed stone and construction sand and gravel, \$25,000 worth of jade and soapstone were produced.

During 1996, Cominco Alaska Inc. mined almost 2.1 billion tons of zinc-lead-silver ore at the Red Dog open pit mine. Cominco shipped 586,700 tons of zinc concentrate, and 107,500 tons of lead concentrates from the port site near Kivalina to Canadian, Circum-Pacific, and European smelters. Red Dog remained the world's largest zinc producer and accounted for approximately 7% of the world's mine-produced zinc. Improved performance of the mill resulted in a 2% increase in concentrate output from 1995 to 1996 even though the amount of ore processed during the same time period decreased by 7%. Approximately 80% of the 417 employees on the Red Dog payroll were Alaskan residents; about 50% were shareholders of NANA Corp., the owner of the deposit.

Kennecott Greens Creek Mining Co. reopened the Greens Creek polymetallic mine on Admiralty Island near Juneau in July 1996, nearly 6 months ahead of schedule. The underground mine had operated from 1989 to the first quarter of 1993, but closed down due to low metal prices. From July to the end of December, Kennecott mined 122,470 tons of ore and produced more than 39,000 tons of concentrates that contained (payable) 77,004 kilograms (kg) silver, 233 kg gold, 8,255 tons zinc, 3,810 tons lead and 193.4 tons copper. About 265 people worked at Greens Creek Mine during the 1996 mine production phase. Annually, Greens Creek Mine was expected to produce about 1,930 kg gold, 342,000 kg silver, 36,300

tons zinc, 18,150 tons lead, and byproduct copper when in full production, making it one of the largest silver mines in North America.

Based on information supplied in DGGs questionnaires, Alaska Placer Mining Application submittals, and telephone surveys, an estimated 144 placer and 3 lode mines produced approximately 5,020 kg gold (see footnote 2) worth \$61.0 million in 1996, an increase of 14% in quantity and 13% in value from 1995 levels. Approximately 1,930 kg (38%) of Alaskan gold was from ore mined at lode mines and 3,090 kg (or 62%) was from placer sources. The number of operating placer mines in 1996 was about the same as that of the previous year. However, the big drop in placer production—from 4,220 kg gold in 1995 to 3,090 kg gold in 1996—was mainly due to the 1995 closure of the Cambior Alaska's Valdez Creek Mine near Cantwell, which had been the State's largest gold mine for 12 years. The placer industry, which provided 825 jobs in 1996, has stabilized and is not expected to decline further.

Nixon Fork Mining Co., the operating subsidiary for Consolidated Nevada Goldfields Inc., mined and milled 36,197 tons of ore and produced about 1,200 kg gold and about 161,000 kg of byproduct copper at the Nixon Fork Mine. Nixon Fork, about 45 kilometers northeast of McGrath in the western region, became Alaska's largest gold mine in 1996. The company employed 71 year-round employees that operate on a 2 week-1 week swing-shift schedule. An estimated 65% of the employees were Alaskan residents, and 10% were from nearby villages. The operation was entirely supported by aircraft and the gold-copper concentrates are sent to smelting facilities of Dallo Inc. at Kosaka, Japan.

Fairbanks Gold Mining Inc. (FGMI), operating subsidiary for Amax Gold Inc., initiated gold production at the Fort Knox gold mine 24 kilometers northeast of Fairbanks in the eastern interior region. At year's end, FGMI provided 243 year-round jobs. About \$76 million will be added to the Alaskan economy annually, which includes a \$300,000 weekly payroll and multimillion dollar electric utility costs paid to Golden Valley Electric Association.

Alaska Gold Co. processed 497,000 cubic meters of pay gravels and produced 731 kg gold from open pit mining operations in the Cape Nome District in the western region.

Cripple Creek Venture, a joint venture between mine operator Yellow Eagle Mining Inc. and Exploration Orbite V.S.P.A. Inc., developed Alaska's first new large-scale placer mine near Ester in the Fairbanks district; active mining took place from June to November 1996.

The ten top Alaskan gold producers in 1996 were: Nixon Fork Mining Co. (McGrath-McKinley District); Alaska Gold Co. (Cape Nome District); Fairbanks Gold Mining Inc. (Fairbanks District); Polar Mining Inc.

(Fairbanks District); Alaska Placer Development (Livengood-Tolovana District); Kennecott Greens Creek Mining Co. (Juneau-Admiralty District); Yellow Eagle Mining Inc. (Fairbanks District); the Clark-Wiltz Partnership (Innoko-Tolstoi District); Little Eldorado Group (Fairbanks District); and Ed Lapp and Sons Inc. (Circle District). These companies produced (by DGGs estimates) more than 3,700 kg gold or 74% of the Statewide total for the year.

Sealaska Corp. initiated a promising new industrial mineral export project at its limestone property near Calder on Prince of Wales Island in the southeastern region. Mining and processing of a 12-million-ton calcium carbonate deposit are expected to begin in the first quarter of 1997. Initial products will consist of ground calcium carbonate for horticultural, environmental and industrial applications and crushed and screened material for wallboard, roofing, and animal feed manufacturing. The significance of Sealaska's ground-breaking effort is that it will be the first project in nearly 20 years to export industrial minerals to markets outside the boundaries of the State.

Peat and top soil production, which is used exclusively for horticultural purposes, was reported from eight companies located in Anchorage, Palmer, Wasilla, Delta Junction, and Fairbanks. Great Northwest Inc. in Fairbanks, Sunshine Services of Delta Junction, and Landscape Supply Corp. in Wasilla were among the top producers in 1996.

Construction activities at the Red Dog Mine near Kotzebue, the Fort Knox Mine near Fairbanks, the Illinois Creek Mine near Galena, the Nixon Fork Mine near McGrath, and the Greens Creek, Kensington and Alaska-Juneau Mines near Juneau increased development expenditures in 1996 to \$394 million, compared with about \$149 million in 1995. The 1996 mineral development cost estimate exceeded the previous high of \$275 million spent in 1988, when the Red Dog and Greens Creek Mines were under construction.

Mineral exploration activities in the southcentral region focused on evaluation of hardrock mineral deposits. Southwestern Alaska saw some of the most active exploration in 1996, with reported expenditures of \$11.6 million, a fourfold increase over the \$2.45 million spent in 1995. The pace of exploration was slower in southeastern Alaska in 1996 than it was in the early 1990's and was less dominated by a few operations. About \$7.2 million was spent, only about 60% as much as the \$12.2 million in exploration expenditures reported in 1995. Although there was no placer thawfield drilling, most regions reported considerable hardrock drill activity, and all was core drilling in the northern, southwestern and southeastern regions. The total drilled, more than 222,240 meters, is more than in any year since 1990.

Exploration increased dramatically in the eastern

interior with activity reported from Tanana in the west to the Canadian border. Expenditures were at least \$18.3 million, up 72% from \$10.6 million in 1995. Much of the mineral exploration in the eastern interior took place near Fairbanks. The largest program was that of Newmont Exploration Ltd. at the True North gold property about 24 kilometers north of Fairbanks. This project was part of a joint venture owned by La Teko Resources Ltd.

In western Alaska, exploration expenditures were \$3.8 million in 1996, slightly less than the \$4.7 million spent the previous year. Kennecott Exploration Co. conducted an airborne geophysical survey in the Candle area of the Seward Peninsula, but most of its efforts were spent drilling the Aurora, Lindblom, and Bonanza Hill properties and trenching mineralized zones at the Mount Distin property. The Alaska Gold Co. conducted an active exploration program, including 9,140 meters of reverse-circulation drilling near Nome. Nova Natural Resources Corp. was pursuing subsea placer operations in the Nome area with a mobile suction dredge similar to the "Tamrod" that was tested by Westgold, Ltd. several years ago. In the McGrath area there was a flurry of exploration and staking spurred by the exploration at Donlin Creek, near Crooked Creek.

In northern Alaska, Cominco Alaska Exploration Inc. at the Red Dog Mine intercepted deposits of zinc ranging from 12% to 20%, lead at 4%, and silver ranging from 70 to 100 grams per ton in two drill holes 120 meters apart. The thickness of the deposits ranged from 58 meters in the drill hole (180 meters deep) with lower mineral concentrations to 33 meters in the drill hole (220 meters deep) with higher concentrations. Definition drilling of the new ore horizon was to continue in 1997. Also in the State's northern region, WGM of Anchorage, with funding from Ventures Resource Corp., conducted a wide-ranging grassroots exploration program in the area east of Wiseman.

The total number of active Alaska state claims increased from more than 25,100 in 1995 to 38,700 in

1996, a 54% increase. The total number of active federal claims remained at about the same level of approximately 8,000 during both 1995 and 1996.

During 1996, the Alaska Legislature and Governor enacted legislation which extended the allowable underground mine shifts from 8 to 10 hours. The Governor created a special water quality working group to study and make recommendations for 12 natural resource-related criteria regulated by State and Federal agencies. These include arsenic, acute toxicity, dissolved metals, and petroleum (hydrocarbon) residual levels—all of which affect mine-related activities.

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1996 USGS mineral production data published in this chapter are estimates as of February 1997. Construction sand and gravel and crushed stone estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at: <http://minerals.er.usgs.gov/minerals/contacts/comdir.html>

²Gold figures in table 1, as reported to the USGS, possibly understate actual 1996 production and value. The canvassing of gold placer mineral production was discontinued by the U.S. Bureau of Mines (the Federal agency formerly responsible for U.S. nonfuel mineral production data collection) in 1994. Gold production and value for Table 1's preliminary numbers are estimated by the USGS. Final total gold production for Alaska is done in collaboration with the State. Data collected by Alaska's State government indicate production in 1996 to have been about 5,020 kg at about \$61 million.

³Thomas K. Bundtzen, Senior Economic Geologist at the DGGS, coauthored with other Alaska officials the text of Alaskan minerals industry information submitted by the DGGS. He may be contacted at the same address and fax number as Mr. Wiltse, telephone: (907) 451-5025.

⁴All tons are metric unless otherwise specified.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ALASKA 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1994		1995		1996 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	10	NA	10	NA	11
Gold 3/ kilograms	5,660 4/	70,300 4/	4,410 4/	56,000 4/	4,500	56,400
Sand and gravel (construction)	15,700	56,200	13,700	48,500	14,000	51,100
Silver 3/ metric tons	W	W	109	18,100	130	22,200
Stone (crushed)	3,870	24,100	3,320 5/	20,400 5/	3,500 5/	22,200 5/
Zinc 3/ metric tons	W	W	321,000	395,000	330,000	371,000
Combined values of lead, stone [crushed dolomite and limestone (1995-96)], and value indicated by symbol W	XX	367,000	XX	(6/)	XX	(6/)
Total	XX	518,000	XX	538,000 7/	XX	523,000 7/

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Recoverable content of ores, etc.

4/ Data collected by the State.

5/ Excludes certain stones; kind and value included with "Combined value" data.

6/ Value excluded to avoid disclosing company proprietary data.

7/ Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

TABLE 2
ALASKA: 1/ CRUSHED STONE 2/ SOLD OR USED BY PRODUCERS
IN 1995, BY USE 3/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	30	152	\$5.07
Coarse and fine aggregates:			
Graded road base or subbase	38	300	7.89
Unpaved road surfacing	21	186	8.86
Other construction materials 4/	79	400	5.06
Unspecified: 5/			
Actual	225	693	3.08
Estimated	2,930	18,700	6.39
Total	3,320	20,400	6.15

1/ Data derived in part from the Alaska Geological Survey.

2/ Includes granite, miscellaneous stone, sandstone, slate, and traprock; excludes limestone-dolomite from State total to avoid disclosing company proprietary data.

3/ Data are rounded to three significant digits; may not add to totals shown.

4/ Includes concrete aggregate (coarse), screening (undesignated), and crusher run (select material or fill).

5/ Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
ALASKA: 1/ CRUSHED STONE SOLD OR USED, BY KIND 2/

Kind	1994				1995			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone-dolomite	1	(3/)	(3/)	\$10.40	1	(3/)	(3/)	\$9.61
Granite	1 r/	W	W	10.00 r/	1	24	\$100	4.17
Sandstone	2	W	W	2.39	--	--	--	--
Slate	1	7	\$48	6.86	1	7	48	6.86
Traprock	7 r/	1,260 r/	5,310 r/	4.22 r/	5	1,030	3,230	3.15
Miscellaneous stone	13 r/	2,500 r/	18,200 r/	7.26 r/	6	2,260	17,000	7.53
Total	XX	3,870	24,100	6.24	XX	3,320	20,400	6.15

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

1/ Data derived in part from the Alaska Geological Survey.

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Excludes limestone/dolomite from State total to avoid disclosing company proprietary data.

TABLE 4
ALASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED
IN 1995, BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	684	\$5,590	\$8.17
Plaster and gunite sands	(2/)	2	8.82
Asphaltic concrete aggregates and other bituminous mixtures	286	2,060	7.20
Road base and coverings	1,100	4,140	3.75
Fill	210	1,200	5.72
Snow and ice control	47	411	8.74
Railroad ballast	24	150	6.25
Other 3/	64	233	3.64
Unspecified: 4/ Estimated	11,200	34,700	3.09
Total or average	13,700	48,500	3.55

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

3/ Includes concrete products.

4/ Includes production reported without a breakdown by end use and estimates for nonrespondents.